Exhibit 5: Corte Madera Creek Flood Risk Management Project, Phase 1 Final Environmental Impact Report

Marin County Flood Control and Water Conservation District

Corte Madera Creek Flood Risk Management Project, Phase 1

Final Environmental Impact Report

Volume 1: Comments and Responses to Comments

State Clearinghouse No. 2020080353

July 2021

PANORAMA ENVIRONMENTAL, INC.

Marin County Flood Control and Water Conservation District

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Table of Contents

Acronyms and Abbreviations i

1 Introduction 1-1

1.1 Introduction to the Comments and Responses 1-1

1.2 Document Organization 1-1

1.3 District Staff Recommends Alternative 1 1-4

2 Comments and Responses 2-1

2.1 Approach 2-1

2.2 Master Responses 2-1

2.3 State, Regional, and Local Agencies 2-31

2.4 Organizations 2-91

2.5 Individuals 2-149

2.6 Public Hearing 2-275

3 Draft EIR Text Revisions 3-1

3.1 Introduction 3-1

3.2 Changes to the Draft EIR 3-1

4 References 4-1

List of Tables

Table 1.2-1 List of Commenters 1-2

Table 2.2-1 Summary of Benefits of Proposed Project Compared to Alternative 1 during the 25-Year Event 2-4

Table 2.2-2 Summary of Alternative 1 Flood Reduction Benefits, Existing Condition Scenario, 25-Year Event 2-9

List of Figures

Figure 1-1 Alternative 1 Elements (Map 1) 1-7

Figure 1-2 Alternative 1 Elements (Map 2) 1-8

Figure 1-3 Alternative 1 Elements (Map 3) 1-9

TABLE OF CONTENTS

Figure 2-1 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 10-Year Flood Event (Upper Corte Madera Creek) 2-13
Figure 2-2 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 10-Year Flood Event (Lower Corte Madera Creek) 2-14
Figure 2-3 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 25-Year Flood Event (Upper Corte Madera Creek) 2-15
Figure 2-4 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 25-Year Flood Event (Lower Corte Madera Creek) 2-16
Figure 2-5 Alternative 1 Change in Water Surface Elevaton from Existing Conditions , 100-Year Flood Event (Upper Corte Madera Creek) 2-17
Figure 2-6 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 100-Year Flood Event (Lower Corte Madera Creek) 2-18
Figure 2-7 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 10-Year Flood Event (Upper Corte Madera Creek) 2-19
Figure 2-8 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 10-Year Flood Event (Lower Corte Madera Creek) 2-20
Figure 2-9 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 25-Year Flood Event (Upper Corte Madera Creek) 2-21
Figure 2-10 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 25-Year Flood Event (Lower Corte Madera Creek) 2-22
Figure 2-11 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 100-Year Flood Event (Upper Corte Madera Creek) 2-23
Figure 2-12 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 100-Year Flood Event (Lower Corte Madera Creek) 2-24
Figure 2-13 Alternative 1 Changes in Water Surface Elevation Year 2100, 10-Year Flood Event (Upper Corte Madera Creek) 2-25
Figure 2-14 Alternative 1 Changes in Water Surface Elevation Year 2100, 10-Year Flood Event (Lower Corte Madera Creek) 2-26
Figure 2-15 Alternative 1 Changes in Water Surface Elevation Year 2100, 25-Year Flood Event (Upper Corte Madera Creek) 2-27
Figure 2-16 Alternative 1 Changes in Water Surface Elevation Year 2100, 25-Year Flood Event (Lower Corte Madera Creek) 2-28
Figure 2-17 Alternative 1 Changes in Water Surface Elevation Year 2100, 100-Year Flood Event (Upper Corte Madera Creek) 2-29
Figure 2-18 Alternative 1 Changes in Water Surface Elevation Year 2100, 100-Year Flood Event (Lower Corte Madera Creek) 2-30

Acronyms and Abbreviations

ADA	Americans with Disabilities Act
CEQA	California Environmental Quality Act
CLOMR	Conditional Letter of Map Revision
CNRA	California Natural Resources Agency
District	Marin County Flood Control and Water Conservation District
DWR	California Department of Water Resources
EIR	Environmental Impact Report
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIGR	Federated Indians of Graton Rancheria
GHG	Greenhouse Gas
KOP	Key Observation Point
MMWD	Marin Municipal Water District
MOU	maintenance memorandum of understanding
project	Corte Madera Creek Flood Risk Management Project, Phase 1
SAFRR	San Anselmo Flood Risk Reduction
TACs	toxic air contaminants
TMP	Traffic Management Plan
Town	Town of Ross (government)
USACE	U.S. Army Corps of Engineers
WSE	water surface elevation

ACRONYMS AND ABBREVIATIONS

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1 Introduction

1.1 Introduction to the Comments and Responses

The Marin County Flood Control and Water Conservation District (the District) is the Lead Agency under the California Environmental Quality Act (CEQA) for the Corte Madera Creek Flood Risk Management Project, Phase 1 (project). The District published a Draft Environmental Impact Report (EIR) for the project on February 1, 2021, and provided agencies, interested parties, and the general public with an opportunity to comment on the Draft EIR. The District circulated the Draft EIR for a 45-day public review period, which ended on March 17, 2021. During the comment period, the District Board held a public hearing on March 2, 2021, to obtain public comments on the adequacy of the Draft EIR. The District received 27 comment letters in addition to oral testimony at the public hearing during the 45-day Draft EIR public review period. Three additional comment letters were submitted on March 22, 23, and 24, 2021, after the public comment period closed.

This document is part of the Final EIR and presents all the comments received on the Draft EIR during the comment period and immediately following the close of the public comment period, as well as the responses to those comments. The Responses to Comments together with the revised Draft EIR constitute the Final EIR. A list of the agencies, organization, and individuals who commented on the Draft EIR is shown in Table 1.2-1.

1.2 Document Organization

The Final EIR is organized as follows:

- **Volume 1: Comments and Responses to Comments:**
  - **Chapter 1: Introduction.** This chapter discusses the purpose and organization of the Final EIR and includes a list of agencies, organizations, and individuals who submitted written comments or made oral comments on the Draft EIR.
  - **Chapter 2: Comments and Responses.** This chapter presents the Master Responses to common comments, reproductions of all comment letters and oral comments received on the Draft EIR, and written responses for each comment.
  - **Chapter 3: Draft EIR Text Revisions.** This chapter shows the text revisions to the Draft EIR, necessary to clarify any minor errors, omissions, or misinterpretations.
  - **Chapter 4: References.** This chapter lists references cited in the Final EIR.
- **Volume 2:** Final EIR, as modified in the Responses to Comments

Table 1.2-1 List of Commenters

Letter Designation	Letter Date	Date Received	Agency or Organization	Commenter's First Name	Commenter's Last Name
State Agencies					
A1	3/16/2021	3/16/2021	California State Lands Commission	Nicole	Dobroski
A2	3/17/2021	3/17/2021	San Francisco Bay Regional Water Quality Control Board	Nicole	Fairley
Regional and Local Agencies					
A3	3/17/2021	3/17/2021	Marin County Parks	Tara	McIntire
A4	2/3/2021	2/3/2021	Ross Valley Sanitary District	Steve	Moore
A5	3/15/2021	3/15/2021	Town of Ross	Joe	Chinn
A6	3/17/2021	3/17/2021	City of Larkspur	Julian	Skinner
Organizations					
B1	3/15/2021	3/15/2021	Friends of Corte Madera Creek Watershed	Sandra	Guldman
B2	3/16/2021	3/16/2021	College of Marin	Klaus	Christiansen
B3	3/17/2021	3/17/2021	Marin Audubon Society	Barbara	Salzman
Individuals					
C1	2/1/2021	2/1/2021	-	Alan	Lutsky
C2	2/5/2021	2/5/2021	-	Mary	Leary
C3	2/9/2021	2/9/2021	-	Gary	Scales
C4	2/16/2021	2/16/2021	-	Sterling	Sam
C5	2/26/2021	2/26/2021	-	Cherilyn	Gilboy
C6	3/2/2021	3/2/2021	-	Suzanne	Mabardy
C7	3/5/3021	3/5/2021	-	Andrew	Avins
				Miriam	Kuppermann
C8	3/12/2021	3/12/2021	-	Hugh D.	Barron
C9	3/15/2021	3/15/2021	-	John	Crane
C10	3/15/2021	3/16/2021	-	Suzanne	Mabardy

Letter Designation	Letter Date	Date Received	Agency or Organization	Commenter's First Name	Commenter's Last Name
C11	3/16/2021	3/16/2021	-	Leslie	O'Connell
				James Bradley	O'Connell
C12	3/16/2021	3/16/2021	-	Garril	Page
C13	3/16/2021	3/16/2021	-	Kyle	Rosseau
C14	3/17/2021	3/17/2021	-	Hugh and Luanne	Cadden
				Ben and Kristen	Swann
C15	3/17/2021	3/17/2021	-	Tyler and Jon	Child
C16	3/17/2021	3/17/2021	-	Beth	Foster
				Paul	Furusho
C17	3/17/2021	3/17/2021	-	Arlene	Fox
				Stephen	Whitcomb
C18	3/15/2021	3/18/2021	-	Charles	Goodman
C19	3/22/2021	3/22/2021	-	Dan	Little
C20	3/23/2021	3/23/2021	-	Nick	Romero
C21	3/24/2021	3/24/2021	-	Nick	Romero
Public Hearing					
PH (Oral Comments)	3/2/2021	3/2/2021	-	Michael	Wanger
			-	Garril	Page
			-	Laura	Conrow
			-	Charles	Goodman
			-	William	Conrow
			Town of Ross	Julie	McMillan
			-	Beth	Foster
			-	Pam	Grant

1.3 District Staff Recommends Alternative 1

District staff will be recommending that the District Board approve the Draft EIR Alternative 1. District staff recommends approval of Alternative 1 instead of the proposed project. Alternative 1 avoids modifications to Frederick Allen Park and would instead install four additional large fish pools in the concrete channel. Alternative 1 involves the same project activities and elements in areas upstream and downstream of Frederick Allen Park. The staff's decision to recommend adoption of Alternative 1 reflects public comments received during the Draft EIR public review period, public comments made during the Town of Ross (Town) public workshop on April 15, 2021, the results of the Town survey about the project, and the support and preference for Alternative 1 expressed by Town Council members.

Section 15088.5 in the State CEQA Guidelines requires recirculation of a Draft EIR when:

> … significant new information is added to the EIR after public notice is given of the availability of the draft EIR for public review under Section 15087 but before certification. As used in this section, the term "information" can include changes in the project or environmental setting as well as additional data or other information. New information added to an EIR is not "significant" unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (including a feasible project alternative) that the project's proponents have declined to implement. "Significant new information" requiring recirculation include, for example, a disclosure showing that:
>
> > (1) A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented.
> >
> > (2) A substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance.
> >
> > (3) A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the environmental impacts of the project, but the project's proponents decline to adopt it.
> >
> > (4) The draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.

The Draft EIR does not need to be recirculated to address Alternative 1, as Alternative 1 would not result in any new significant impacts or increases in the severity of any impacts that were described in the Draft EIR. Alternative 1 was described and analyzed in detail in the Draft EIR.

Alternative 1 includes the following elements of the proposed project, as described in Chapter 2 of the Draft EIR:

- Removal of the Denil fish ladder at the upstream limit of Unit 3
- Regrading and lowering the channel in Unit 4
- Installation of new grade control and slope protection in Unit 4
- New/modified short floodwalls (approximately 2 to 4 feet tall) in Unit 3 and Unit 2
- Stormwater pump station with backup power in Granton Park
- New and enlarged fish pools within the concrete channel in Unit 3 (with four additional fish pools in the concrete channel adjacent to Frederick Allen Park for Alternative 1, as described in Chapter 5 of the Draft EIR)
- Removal of a portion of the concrete channel walls and restoration of tidal wetland and transitional habitat in Unit 2.

Alternative 1 would avoid removal of the concrete channel in upper Unit 3 in Frederick Allen Park. Alternative 1 would not involve tree removal, grading, or landscaping in Frederick Allen Park. Figure 1-1 through Figure 1-3 show the Alternative 1 elements that are proposed for implementation.

The analysis of potential project impacts in the Draft EIR also addresses the potential impacts of Alternative 1, where the proposed project and Alternative 1 elements would be the same. The different potential impacts of Alternative 1 are described and evaluated in Chapter 5 of the Draft EIR. Chapter 5 of the Draft EIR includes separate analyses of potential Alternative 1 flood risk reduction and air quality impacts. All mitigation measures required to address the potential impacts of Alternative 1 were described in the Draft EIR and would be implemented by the District. For these reasons, Alternative 1 was sufficiently evaluated in the Draft EIR to recommend for project approval, and recirculation of the Draft EIR is not required because none of the circumstances requiring recirculation of a Draft EIR have occurred.

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Figure 1-1 Alternative 1 Elements (Map 1)

Source: (Tele Atlas North America, Inc., 2019; GHD, 2020; USGS, 2012; GHD, 2020; Prunuske Chatham, Inc., 2020; Golden Gate National Parks Conservancy, 2018)

Figure 1-2 Alternative 1 Elements (Map 2)

Source: (Tele Atlas North America, Inc., 2019; GHD, 2020; USGS, 2012; GHD, 2020; Prunuske Chatham, Inc., 2020; Golden Gate National Parks Conservancy, 2018)

Figure 1-3 Alternative 1 Elements (Map 3)

Source: (Tele Atlas North America, Inc., 2019; GHD, 2020; USGS, 2012; GHD, 2020; Prunuske Chatham, Inc., 2020; Golden Gate National Parks Conservancy, 2018)

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2 Comments and Responses

2.1 Approach

This chapter presents the Master Responses to common comments, reproductions of all comment letters and oral comments received on the Draft EIR, and written responses to each comment. Each comment letter has been assigned an alphanumeric code, from A1 through C21, and each comment is numbered in the margin of the comment letter. Responses to the comments follow each letter, and responses are referenced using the same alphanumeric system. For example, the first comment from the first letter, from the California State Lands Commission, is designated A1-1, as is the response to it. Comments from the public hearing are assigned the code "PH" and follow the comment letters.

Several comments have prompted the District to revise the text of the Draft EIR. Revisions to the text of the Draft EIR are shown in this chapter as follows:

- Additions to the text in the Draft EIR are <u>underlined</u>; and,
- Deletions from the text in the Draft EIR are indicated by ~~strikeout~~.

All revisions to the text of the Draft EIR also are shown in Chapter 3, Volume 1 of the Final EIR.

2.2 Master Responses

This section presents Master Responses on topics where similar or the same comments were made by multiple commenters. The Master Responses address the following topics:

- Master Response 1: Preference for Alternative 1 and Comparison of Proposed Project and Alternative 1 Flood Risk Reduction
- Master Response 2: Alternative 3 Impacts and Feasibility
- Master Response 3: Project Design Process Flood Modeling
- Master Response 4: Impacts on Privacy and Private Views
- Master Response 5: Economic Impacts and Project Cost
- Master Response 6: Frederick Allen Park Habitat and Impacts

2.2.1 Master Response 1: Preference for Alternative 1 and Comparison of Proposed Project and Alternative 1 Flood Risk Reduction

Preference for Alternative 1

Comments in Support of Alternative 1

Four comment letters stated support for Alternative 1: No Frederick Allen Park Alternative in lieu of the proposed project. Fourteen additional comment letters discussed concerns about the impacts of the proposed project construction in Frederick Allen Park. This Master Response summarizes the local support expressed for Alternative 1 and the environmental concerns about the proposed project that were raised by the local community in comment letters and in a survey conducted by the Town after publication of the Draft EIR. This Master Response also provides additional detail on the difference in flood risk reduction benefits between the proposed project and Alternative 1. This Master Response further clarifies that District staff will not be recommending the proposed project. Rather, District staff will be recommending approval of Alternative 1 to the District Board of Supervisors.

Additional Local Support for Alternative 1

The Town held a public workshop on April 15, 2021, to discuss the proposed project and obtain community input on a preference for the proposed project or Alternative 1. During the workshop, the majority of community members who commented indicated they did not support the Frederick Allen Park portion of the proposed project but did support Alternative 1. Local students gave a presentation in support of the proposed project, explaining why they wanted to remove the fence and open access to the creek, and how opening creek access would support educational opportunities. Following the workshop, the Town distributed an e-mail questionnaire via the town-wide e-mail system to gather feedback from residents on their preferences for the proposed project or Alternative 1, and to inform them about the Town Council's preference. A total of 363 residents and stakeholders completed the Town's questionnaire. 62 percent of the respondents preferred Alternative 1, compared to 29 percent who preferred the proposed project. The more than 300 responses to the survey provide a broader base to evaluate community preference than the 21 comment letters on the Draft EIR. The responses to the questionnaire indicate a strong community preference for Alternative 1. The most frequent reason (70.7 percent) for supporting Alternative 1 over the proposed project was that the trees could take up to 20 years to grow to the same height as the existing condition. The second most frequent (50.18 percent) reason for supporting Alternative 1 over the proposed project was the substantially similar flood benefits of Alternative 1 to the proposed project.

A Town Council meeting was held on May 13, 2021, to discuss the members' project preference and provide a recommendation to the District. The Town Council voted unanimously to recommend Alternative 1 to the District. The Town Manager submitted a letter to the District on May 14, 2021, formalizing the Town's recommendation for Alternative 1.

Key Community Concerns about Potential Project Impacts

Various community concerns were raised about the project during public outreach and the May 13, 2021, Town Council meeting.

Trees, Shade, and Canopy Restoration
One primary concern is the significant impact on visual quality in Frederick Allen Park after project construction and for the 10-year period following, until planted trees and vegetation mature. An additional concern is that U.S. Army Corps of Engineers (USACE) could enforce a 15-foot "no tree" setback from the new and existing floodwalls.

Impacts to Tributary Drainage into Corte Madera Creek
According to the hydraulic model, the water surface elevation (WSE) would increase within the creek/channel downstream from the fish ladder under the proposed project and Alternatives 1, 2, and 3. The Town noted that compared with the proposed project, Alternative 1 would improve tributary drainage upstream from 15 Sir Francis Drake (approximately 250 feet south of the Denil fish ladder) but would hinder tributary drainage downstream from 11 Sir Francis Drake to Kentfield Hospital. The Town noted that Federal Emergency Management Agency (FEMA) requires any project that causes any increase in the 100-year WSE within a creek channel to demonstrate that no residential or commercial structures will be affected by the rise.

Flood Risk Reduction
The Town noted that Alternative 1 would have similar WSE reductions as the proposed project outside the creek/channel in 10-year and 25-year storm events. However, during a 100-year storm event, the WSE under Alternative 1 could be between 0.2 and 1 foot higher than the proposed project in areas adjacent to Frederick Allen Park and downstream in Kentfield. The difference between the proposed project and Alternative 1 flood risk reduction is discussed below in further detail.

Construction Impacts and Costs
Construction impacts of Alternative 1 would be confined to the fish ladder, creek bottom, and channels in Unit 4, while the construction impacts of the proposed project would require temporary closure of Bike Route 20 and a longer period of construction for the work in Frederick Allen Park. In addition, the construction cost for the proposed project would be greater than for Alternative 1. Master Response 5: Economic Impacts and Project Cost explains that cost is not an environmental consideration under CEQA.

Comparison of Proposed Project and Alternative 1 Flood Risk Reduction Benefits
Both the proposed project and Alternative 1 would result in flood reduction benefits, as presented in Section 3.9 and Chapter 5 of the Draft EIR. The proposed project would result in more flood reduction benefits than Alternative 1, as shown in Figure 5.3-8 in the Draft EIR (GHD, 2020). Table 2.2-1 shows the number of additional structures that would experience reduced flooding if the proposed project were implemented instead of Alternative 1. The proposed project would result in flood reduction at an additional 48 structures compared to Alternative 1. Alternative 1, although resulting in fewer flood reduction benefits than the proposed project, would reduce flooding at approximately 161 structures (see Master Response 3 for further details on Alternative 1 flood risk reduction benefits). Both the proposed project and Alternative 1 would result in substantial flood risk reduction benefits, compared to existing conditions.

Table 2.2-1 Summary of Benefits of Proposed Project Compared to Alternative 1 during the 25-Year Event

Number of Additional Structures with Reduced Flooding under the Proposed Project, Compared to Alternative 1				
Jurisdictional Land Use	**Area No Longer Inundated**	**Greater than 1-foot Reduction in Flood Depth**	**0.5 to 1-foot Reduction in Flood Depth**	**0.2 to 0.5-foot Reduction in Flood Depth**
Commercial.	0	0	0	0
Institutional	0	0	0	0
Residential	6	3	8	29
Tax Exempt	0	0	0	2
Total	**6**	**3**	**8**	**31**

Source: (Town of Ross, 2021)

Town of Ross and Regulatory Approvals Required for Proposed Project

As described above, the Town Council voted unanimously to recommend Alternative 1 to the District. In addition, community members expressed a clear preference for Alternative 1 through a community-wide survey.

Project construction must be completed by the end of 2022 to comply with the stipulations of the California Department of Water Resources (DWR) grant funding for the project. The DWR grant would be used to fund 50 percent of the project. As described on page 1-5 in the Draft EIR, the Town owns Frederick Allen Park. The District would need to obtain the Town's approval of an easement for construction and maintenance of project elements on the Town's property, including Frederick Allen Park. The Town also would have permitting authority over project design review and tree removal within its jurisdiction. This discretionary review would make the Town a Responsible Agency under CEQA in the review of project elements under the Town's jurisdiction and could result in significant delays in project implementation.

During a meeting between the District and the USACE regarding Section 408 authorization for the project, USACE indicated that it would not initiate review of the Section 408 application until receipt of the 60 percent design plans for the project. Because of the complexity of the project's Frederick Allen Park component, the 60 percent design of Frederick Allen Park would take approximately 4 months to complete. In contrast, information on Alternative 1 sufficient to prepare 60 percent design currently is available (see Master Response 3). Given the amount of time that would be required to complete the permitting process with the Town and USACE, and to obtain an easement from the Town, it is unlikely that the District would be able to obtain all permits in time to start project construction in spring 2022 for the proposed project.

Conclusion and Staff Recommendation to Adopt Alternative 1

For these reasons, District staff will recommend the District Board of Supervisors approve Alternative 1. The recommendation to approve Alternative 1 reflects public preference for Alternative 1, the Town Council preference for Alternative 1, and the improved ability to meet

the grant funding construction deadline under Alternative 1 because of the reduced complexity in the design and permit approval process compared to the proposed project.

2.2.2 Master Response 2: Alternative 3 Impacts

Several comments suggested that the new floodwalls should be constructed out of natural materials instead of concrete.

Alternative 3 in Chapter 5 of the Draft EIR considers the environmental benefits and potential impacts of using natural materials instead of concrete. . As discussed in the Draft EIR, construction of a natural material floodwall would involve a larger footprint and require additional tree removal because it would not be feasible to construct with natural materials on top of the existing concrete floodwall. A new natural materials floodwall would have to be set back from the existing floodwall. Construction of a natural material floodwall in Unit 2 would require the removal of 66 trees, compared to the removal of only two trees for construction of the proposed concrete floodwall attached to the existing floodwall in Unit 2.

Furthermore, although Alternative 3 was evaluated in the Draft EIR as including a non-concrete floodwall in Unit 2, on further consideration and an engineering evaluation, District staff determined that a non-concrete rock and earthen floodwall would be treated as a levee by USACE and would be subject to USACE review under Section 408. A levee designed to meet USACE standards would have an even larger impact area than that evaluated in the Draft EIR, and would result in a much greater setback for vegetation when compared with a concrete floodwall attached to the existing floodwall. The levee would result in removal of a substantial number of trees to construct and maintain the levee in compliance with USACE requirements and would not be compatible with the existing informal recreational uses on the left bank or any future recreational use of the area. Use of non-concrete materials for construction of the floodwall in Unit 2 would result in greater environmental impacts than a concrete floodwall attached to the existing floodwall.

The District has integrated non-concrete materials into the 60 percent design for Alternative 1 where feasible, and this would reduce environmental impacts. Specifically, the District is proposing to construct the transition structure at the connection between Units 3 and 4 using engineered streambed material instead of concrete to protect the existing sanitary sewer line and stabilize the channel grade.

2.2.3 Master Response 3: Future Design and Flood Modeling

Project Design Process

Several comment letters included questions about the process to be used by District staff in finalizing the project design, updating the hydraulic modeling, and sharing the model results with the community. The Draft EIR was prepared when District staff had developed a 35 percent concept level of design/engineering. The 35 percent design level is typical and sufficient for project evaluation in a CEQA document. Project proponents typically do not

prepare final (100 percent) engineering and design before the CEQA process because a project may be modified during and as a result of the CEQA process.

District staff will recommend approval of an alternative, specifically Alternative 1, in lieu of the proposed project. After publication of the Draft EIR and in response to public comments on the Draft EIR, District staff completed 60 percent design and engineering of Alternative 1. Additional engineering and design was not completed for the proposed project because the District staff are no longer recommending approval for the proposed project. After District staff completes the permitting process with the regulatory agencies, the final engineering and design documents will be prepared to comply with the requirements of the regulatory agencies. The requirements of the regulatory agencies are not known before completing the permitting process, and therefore the current design reflects this best available information at this time. Additional details on the Alternative 1 design and hydraulic modeling results for the 60 percent engineering are presented in this Master Response, in response to public comments. A significant adverse flood impact was defined in the Draft EIR as an increase in WSE at any structure of 0.2 foot or more. As discussed in this Master Response, the flood impacts of Alternative 1's 60 percent design are consistent with the impacts for this alternative described in the Draft EIR. None of the criteria required under CEQA for recirculation of a Draft EIR have occurred.

60 Percent Design and Updated Modeling

60 Percent Design for Alternative 1

After publication of the Draft EIR, 60 percent design was completed for Alternative 1. This 60 percent design includes additional details on the transition between the concrete channel and the natural channel in Unit 4. The fish ladder removal and transition between the concrete channel and natural channel after removal of the fish ladder would be substantially similar to the description of the proposed project Unit 4 activities described in Chapter 2 in the Draft EIR; however, the 60 percent design includes the following additional details about the Unit 4 transition:

- A planted rock slope would be installed for 510 feet along the left bank upstream from Lagunitas Road Bridge and within the District's easement.
- A sheet pile retaining wall would be installed for 122 feet along the right bank to protect the slope at 23, 25, and 27 Sir Francis Drake Boulevard.
- Engineered streambed material (large rock and fines) would be used to protect the buried sewer line instead of concrete.
- A fish resting pool would be created within the engineered streambed material, just upstream from the concrete channel.

Hydraulic Model Updates

GHD has updated the hydraulic modeling for Alternative 1, to reflect the 60 percent design and incorporate additional details on the channel design that were not available before publication of the Draft EIR. A summary of the key updates to the hydraulic model is as follows:

- The model platform has been updated from HEC-RAS Version 5 to HEC-RAS Version 6.
- The hydraulic model upstream from the Ross Creek confluence has been updated based on the hydraulic model developed for the San Anselmo Flood Risk Reduction (SAFRR) project, which included project elements at the flood detention basin at the Sunnyside Nursery Site, the Bridge Building #2 site (634-636 San Anselmo Ave.) in downtown San Anselmo, and other foreseeable future projects in the reach.
- The earthen channel geometry downstream from the concrete channel has been updated based on the bathymetric data surveyed in 2018, as a part of the Corte Madera Creek Levee Evaluation project.
- A verification analysis has been prepared, using the December 15, 2016, January 10, 2017, and February 7, 2017 flood events to check and compare the model output with the high-water mark data at Bon Air Bridge. The n factor for the earthen channel in Unit 2 and Unit 1 was set at 0.02 foot, based on the observed high-water marks and model results.
- The existing Bon Air Bridge has been replaced in the hydraulic model with the new Bon Air Bridge geometry for the future condition scenarios.
- The hydraulic model geometries have been updated along the concrete channel and Unit 4 for the existing condition scenarios, based on survey data collected by GHD in 2020 and 2021.
- The hydraulic model geometries have been updated with the revised Corte Madera Creek Flood Risk Management Project design for Alternative 1 along the concrete channel and Unit 4 for the future condition scenarios.

Hydraulic Model Scenarios

The hydraulic modeling includes the following six scenarios:

1. Existing Condition Without Project
2. Existing Condition With Alternative 1
3. Future Condition Without Project
4. Future Condition With Alternative 1
5. Year 2100 Future Condition Without Project
6. Year 2100 Future Condition With Alternative 1

The existing condition without project reflects the current hydraulic conditions of Corte Madera Creek without construction of any planned or approved flood control projects. The existing condition with project reflects the existing condition model with all proposed Alternative 1 elements incorporated. The future condition without project reflects the hydraulic conditions of Corte Madera Creek with implementation of planned and/or approved projects listed in Table

3.9-5 of the Draft EIR. The future condition without project scenario also includes an intermediate level of sea level rise for 2067, as described in the Draft EIR. The future condition with project reflects the future condition model with Alternative 1 elements incorporated into the model. The Year 2100 future condition without project scenario includes all projects included in the future condition without project scenario and incorporates the California Natural Resources Agency (CNRA) predicted long-term sea level rise for year 2100. The future Year 2100 future condition with Alternative 1 scenario adds the proposed project elements to the Year 2100 future condition without project scenario.

Figure 2-1 through Figure 2-6 show the Alternative 1 changes to the WSE and reflect the difference in WSE between the Existing Condition Without Project and Existing Condition With Alternative 1 scenarios under a 10-, 25-, and 100-year flood, using the updated modeling for the 60 percent design. Figure 2-7 through Figure 2-12 show the Alternative 1 changes to the WSE under for the future condition scenario, and reflect the difference in WSE between the Future Condition Without Project and Future Condition With Alternative 1 under the 10-, 25-, and 100-year flood conditions. The assumptions used in the future condition modeling are described on pages 3.9-35 through 3.9-37 in Section 3.9 in the Draft EIR and are supplemented by the model updates described above. Figure 2-13 through Figure 2-18 show the Alternative 1 changes to the WSE under a "high-emissions likely" sea-level rise scenario, to reflect 2100 projected sea-level rise based on the 2018 Update of the State of California Sea-Level Rise Guidance (California Ocean Protection Council, 2018). Figures 2-13 through 2-18 reflect the difference in WSE between the Year 2100 Future Condition Without Project and Year 2100 Future Condition with Alternative 1 scenarios under the 10-,25-, and 100-year flood conditions.

Areas shown in the figures as "Flows Confined to Channel" are areas that are currently flooded by Corte Madera Creek, which are predicted to no longer have flood inundation from Corte Madera Creek overtopping after Alternative 1 is implemented. Areas shown in the figures with "Flooding Reduced" are areas with reduced flood inundation (greater than 0.2 foot) from creek overtopping after Alternative 1 is implemented. The change in WSE shown on the maps reflects a comparison between WSE without implementation of Alternative 1 and the WSE after implementation of Alternative 1 for each modeled scenario.

The geographic extent of the figures showing the changes in WSE differs from the figures included in the Draft EIR. The geographic extent of the figures was expanded to show areas downstream from Unit 2 in response to comments from the City of Larkspur. As discussed on page 3.9-39 in the Draft EIR, a threshold of 0.2 foot (2.4 inches) was used for determining whether a potentially significant increase or decrease in WSE would occur at any structure. The 0.2-foot threshold is a reasonable level of precision for evaluating flooding impacts, considering the standards for accuracy and precision associated with hydraulic modeling.

Table 2.2-2 shows the significant (greater than 0.2-foot) flood risk reduction benefits at parcels in Ross Valley that are predicted to result from implementation of Alternative 1. Table 3.9-7 of the Draft EIR provides the flood reduction benefits for the proposed project and shows the maximum flood depth reduction at each parcel within the study boundary. Table 2.2-2 below

shows the average flood depth reduction at each parcel for Alternative 1. The average flood depth reduction at each parcel was obtained by averaging the change in water surface elevation geographically across the parcel in GIS. The average flood depth reduction differs from the maximum flood depth reduction provided in Table 3.9-7 in the Draft EIR for the proposed project. The methodology for calculating the flood depth reduction at parcels for was updated Alternative 1 to use the average instead of the maximum reduction to better represent the full range of flood depth reduction across the entire parcel.

Table 2.2-2 Summary of Alternative 1 Flood Reduction Benefits, Existing Condition Scenario, 25-Year Event

Jurisdiction/Land Use	Number of Structures with Reduced Flooding				
	Area No Longer Inundated After Project	1 to 4.5 feet reduction in water surface	0.5 to 1 foot reduction in water surface	0.2 to 0.5 foot reduction in water surface	Total
Kentfield					
Commercial	3	3			6
Institutional	17				17
Residential	36		10	22	68
Kentfield Total	*56*	*3*	*10*	*22*	*91*
Larkspur					
Commercial					0
Institutional					0
Residential					0
Larkspur Total	*0*	*0*	*0*	*0*	*0*
Town of Ross					
Commercial	1		1	8	10
Institutional	1	1	1	2	5
Residential	4		16	35	55
Ross Subtotal	*6*	*1*	*18*	*45*	*70*
Total All Areas	**62**	**4**	**28**	**67**	**161**

[a] The reduction in flooding reflects changes in WSE based on model predictions for the existing hydrologic conditions. Reduction in flooding of less than 0.2 foot is below the model precision and is interpreted as no change in flood elevation.

Consistency with Draft EIR Conclusions

The Draft EIR states Alternative 1 would have no significant impacts on flooding. No mitigation measures are therefore required to address downstream flooding. As described in the Draft EIR and above, a threshold of 0.2 foot (2.4 inches) was used for determining whether a potentially significant increase or decrease in WSE would occur. Similar to the proposed project, Alternative 1 would result in an increase in WSE of 2 to 6 inches in the parking lot at the College of Marin near College Avenue. These impacts would be limited to the parking lot and elevated trailers at the College of Marin, and, as such, are not considered new or significant impacts.

Similar to the proposed project, Alternative 1 would result in a WSE increase of approximately 1 inch or less (less than 0.2 foot) in residential areas. The modeled increase in WSE at all structures would be less than the threshold of significance. Therefore, Alternative 1 would result in a net reduction in flooding, as shown in Table 2.2-2, and would not result in any new significant flood risk impacts. The results of the updated hydraulic modeling based on the 60 percent design are consistent with the conclusions in the Draft EIR. As discussed in Section 1.3 above, none of the criteria for recirculation of a Draft EIR (Section 15088.5 of CEQA Guidelines) have occurred.

If the project is approved, the modeling will be updated after the final engineering and design are completed. If, following the District's certification of this EIR and project approval, the results of final design and modeling are inconsistent with the EIR conclusions and determine that the project would result in a new significant impact from flooding and no mitigation measures are available to address the impact, a responsible agency would be required under CEQA to prepare and circulate a subsequent or supplemental EIR to address the new significant impact before project implementation, consistent with the requirements of CEQA Guidelines Sections 15162(c) and 15163.

2.2.4 Master Response 4: Impacts on Privacy and Private Views

Several comment letters included comments about the impacts from private views (e.g., residences along Corte Madera Creek) from project implementation and impacts on privacy for the residences along Corte Madera Creek in the vicinity of Frederick Allen Park.

The visual and aesthetic conditions in the project area are discussed in Section 3.1, Aesthetic and Visual Resources, in the Draft EIR. On December 28, 2018, the California Natural Resources Agency published an update to the State CEQA Guidelines, clarifying that public views are the focus for environmental impacts under CEQA. The change to Appendix G in the State CEQA Guidelines specifically clarified that "public views are those that are experienced from a publicly accessible vantage point." A number of legal cases have addressed this issue, including: Preserve Poway v. City of Poway (2016) 245 Cal.App.4th 560; Porterville Citizens for Responsible Hillside Development v. City of Porterville (2007) 157 Cal.App.4th 885, 889, 901; Bowman v. City of Berkeley (2005) 122 Cal.App.4th 572; and Mira Mar Mobile Community v. City of Oceanside (2004) 119 Cal.App.4th 477, 485, 492.

Public views under CEQA include those views that are experienced by the collective public. These include views available from publicly accessible viewing spaces, as opposed to views from privately owned properties. Under CEQA, the question is whether a project would affect the environment of people in general, not whether a project would affect particular individuals (e.g., Mira Mar Mobile Community v. City of Oceanside [2004] 119 Cal.App.4th 477, 492 [14 Cal.Rptr.3d 308 Mira Mar]). Private views are views seen from privately owned land and typically are viewed by individual viewers, including views from private residences. The analysis in the Draft EIR focuses on public views as experienced from public vantage points (e.g., Bike Route 20 or local roadways), consistent with the State CEQA Guidelines and case law. Although the Draft EIR does not address private views, the visual simulation and analysis presented in it provide an approximation of the impact on private views, where the private views would be similarly situated to the public views evaluated in the Draft EIR.

2.2.5 Master Response 5: Economics and Project Cost

Several comment letters included questions about the project's cost or its benefits-to-cost ratio. In accordance with CEQA, the Draft EIR evaluated the potentially significant environmental effects of the project. Economic (e.g., financial liability, property values) and social or quality-of-life effects of a project are generally not considered to be environmental impacts under CEQA. Section 15131 in the State CEQA Guidelines limits the analysis of economic impacts to the environmental change that would have an anticipated economic impact. Specifically:

> (a) Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

The Draft EIR included a thorough evaluation of the project's physical changes on the environment. The project's cost of implementation and the ratio of its economic benefits to its costs are not environmental impacts subject to CEQA analysis. Economic feasibility is factored into alternative feasibility, as discussed in Chapter 5 in the Draft EIR. As discussed in Chapters 1 and 2 in the Draft EIR, a project objective would be fiscal responsibility, which would include the ability to implement the project with existing and reasonably foreseeable funding.

2.2.6 Master Response 6: Frederick Allen Park Habitat

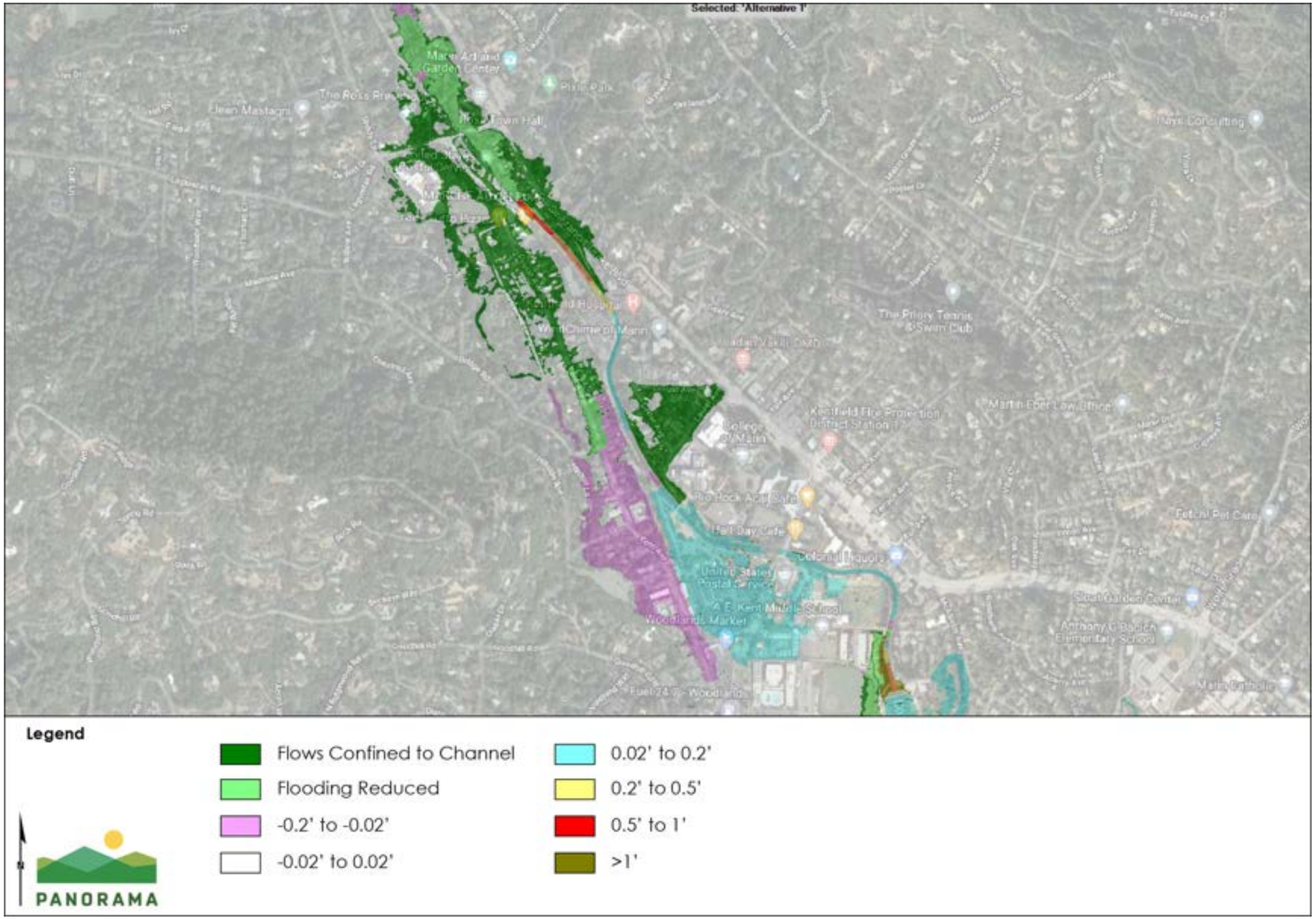
Several comment letters expressed concerns regarding removal of mature habitat in Frederick Allen Park.

As shown in Figure 3.3-1 on page 3.3-8 in the Draft EIR, Frederick Allen Park is mapped as an urban/developed habitat type because it is a landscaped park with ornamental plantings. As

discussed in Section 3.3, Biological Resources, in the Draft EIR, the existing concrete channel adjacent to Frederick Allen Park has restricted the establishment of riparian vegetation. Although mature trees are found in Frederick Allen Park outside the concrete walls, they are ornamental trees that were introduced to the area as part of residential development. These trees are not considered to be riparian habitat because they are not hydrologically connected to the creek. The vegetation in Frederick Allen Park includes numerous non-native trees and lacks an understory vegetation community because of the dense canopy cover and intensity of human disturbance throughout the area.

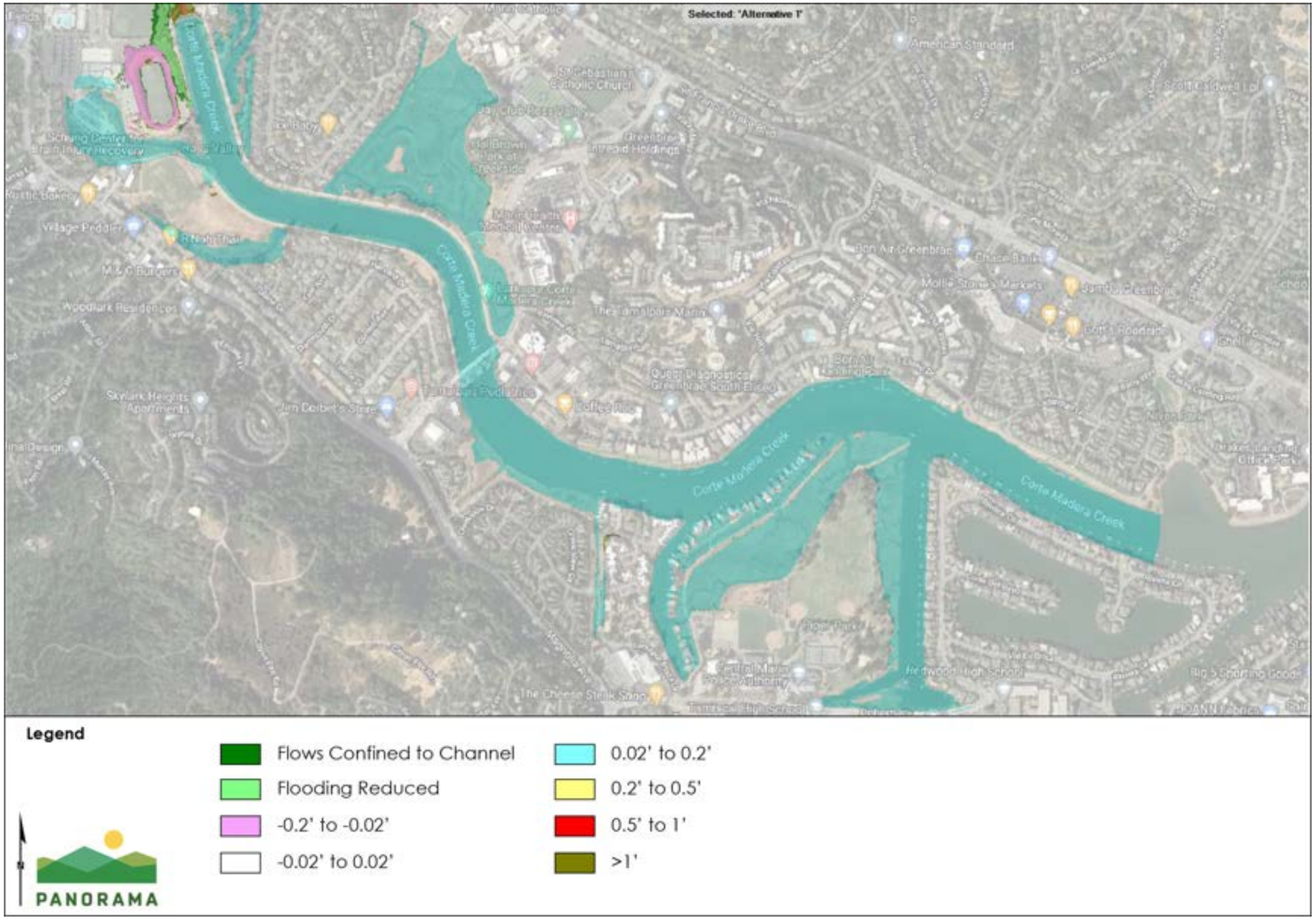
The project as proposed in the Draft EIR would create a natural riparian habitat in Frederick Allen Park by removing the concrete channel and planting with native riparian vegetation, which would include willows, grasses, forbs, and bushes as well as trees. Removal of the concrete channel would allow a connection between the creek and the riparian vegetation, to be planted as a part of the project. A riparian habitat in Frederick Allen Park would attract a larger diversity and abundance of birds and wildlife species than currently are present in the area, because the riparian vegetation and natural stream channels would provide suitable habitat for a greater number of species than the existing landscaped vegetation and concrete channel. While the riparian habitat creation was included in the proposed project, it would not be implemented with Alternative 1 and none of the existing trees or concrete channel in Frederick Allen Park would be removed with implementation of Alternative 1.

Figure 2-1 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 10-Year Flood Event (Upper Corte Madera Creek)



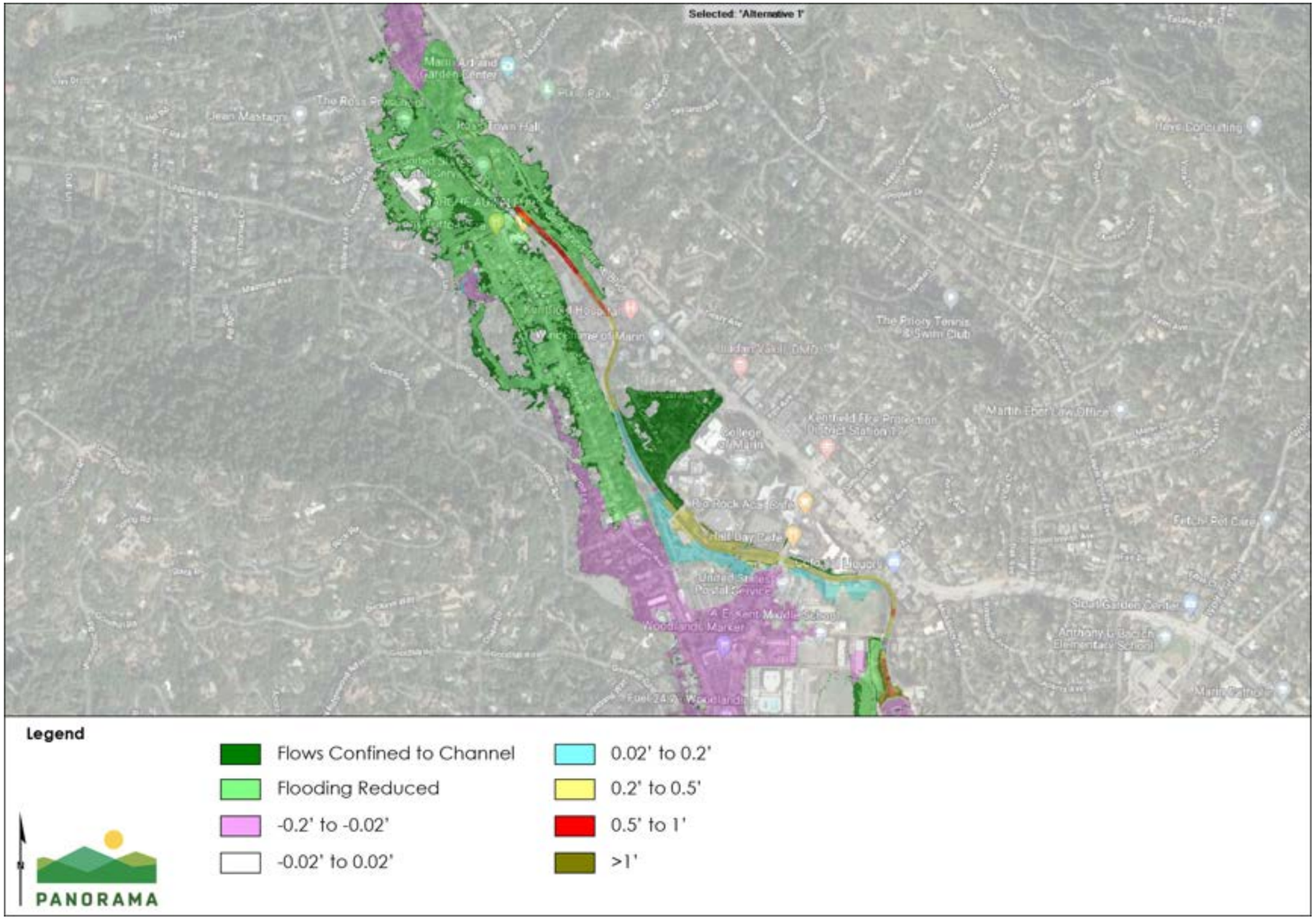
Source: (GHD, 2021)

Figure 2-2 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 10-Year Flood Event (Lower Corte Madera Creek)



Source: (GHD, 2021)

Figure 2-3 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 25-Year Flood Event (Upper Corte Madera Creek)

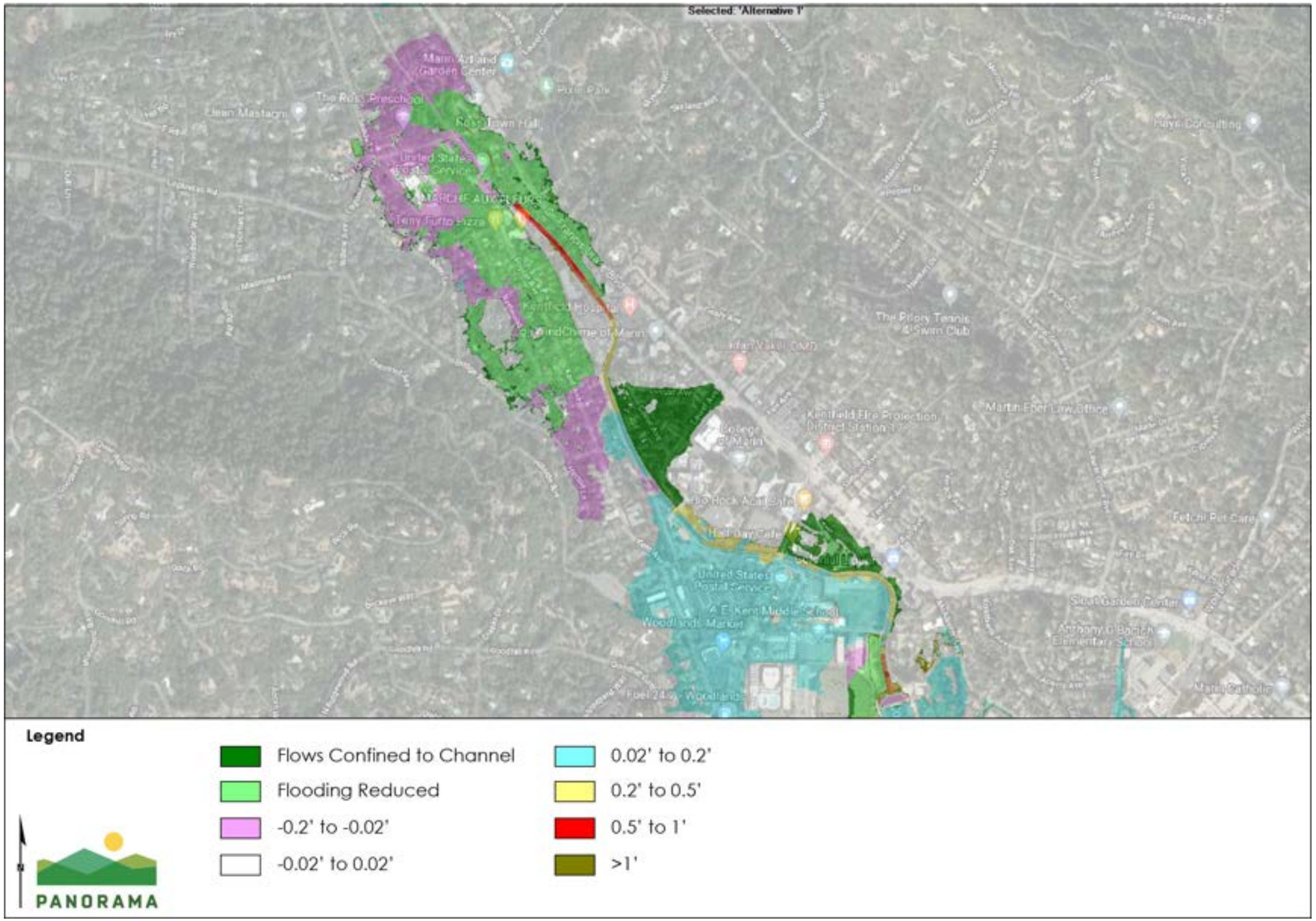


Source: (GHD, 2021)

Figure 2-4 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 25-Year Flood Event (Lower Corte Madera Creek)

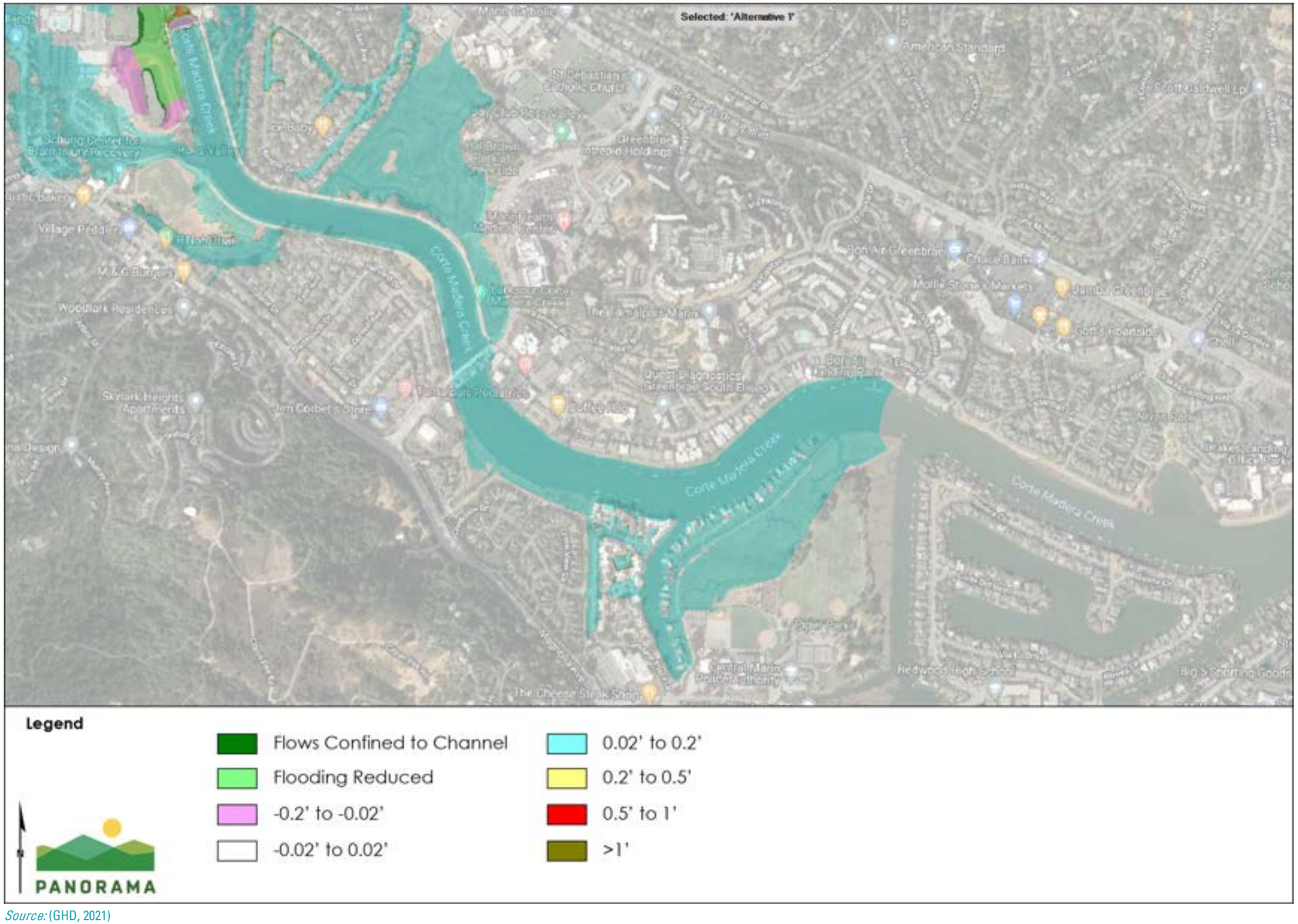
Source: (GHD, 2021)

Figure 2-5 Alternative 1 Change in Water Surface Elevaton from Existing Conditions , 100-Year Flood Event (Upper Corte Madera Creek)



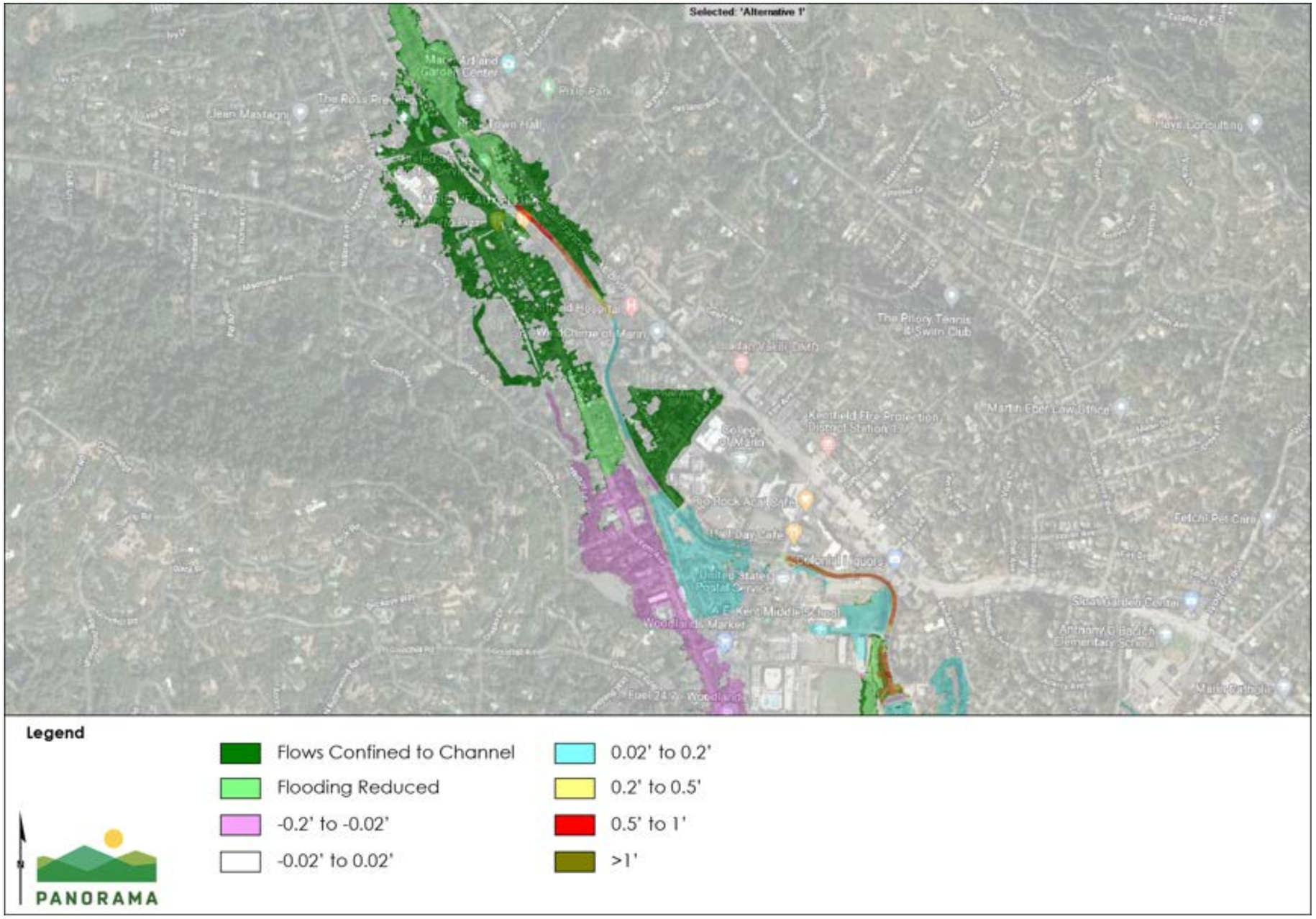
Source: (GHD, 2021)

Figure 2-6 Alternative 1 Change in Water Surface Elevation from Existing Conditions, 100-Year Flood Event (Lower Corte Madera Creek)



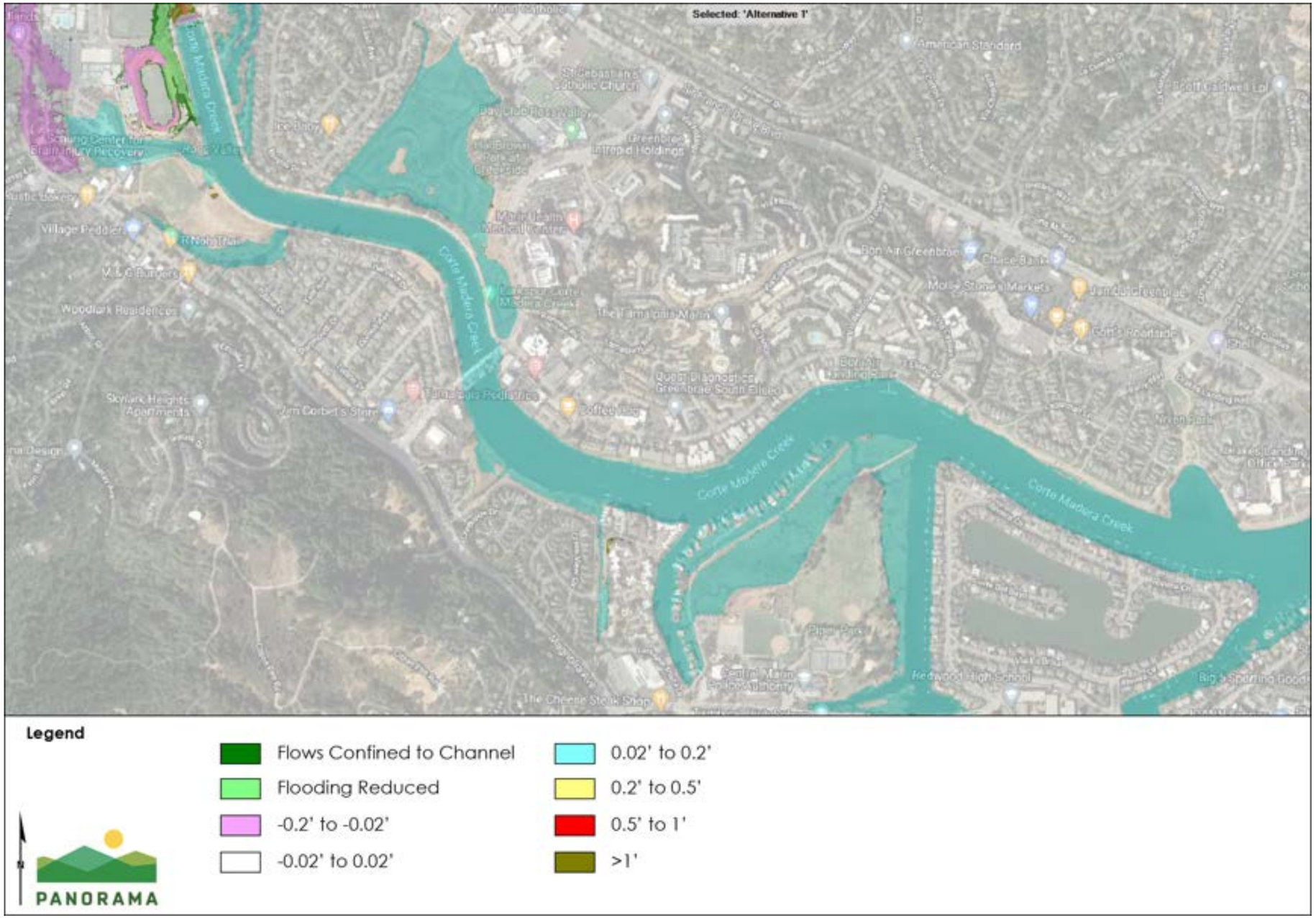
Source: (GHD, 2021)

Figure 2-7 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 10-Year Flood Event (Upper Corte Madera Creek)



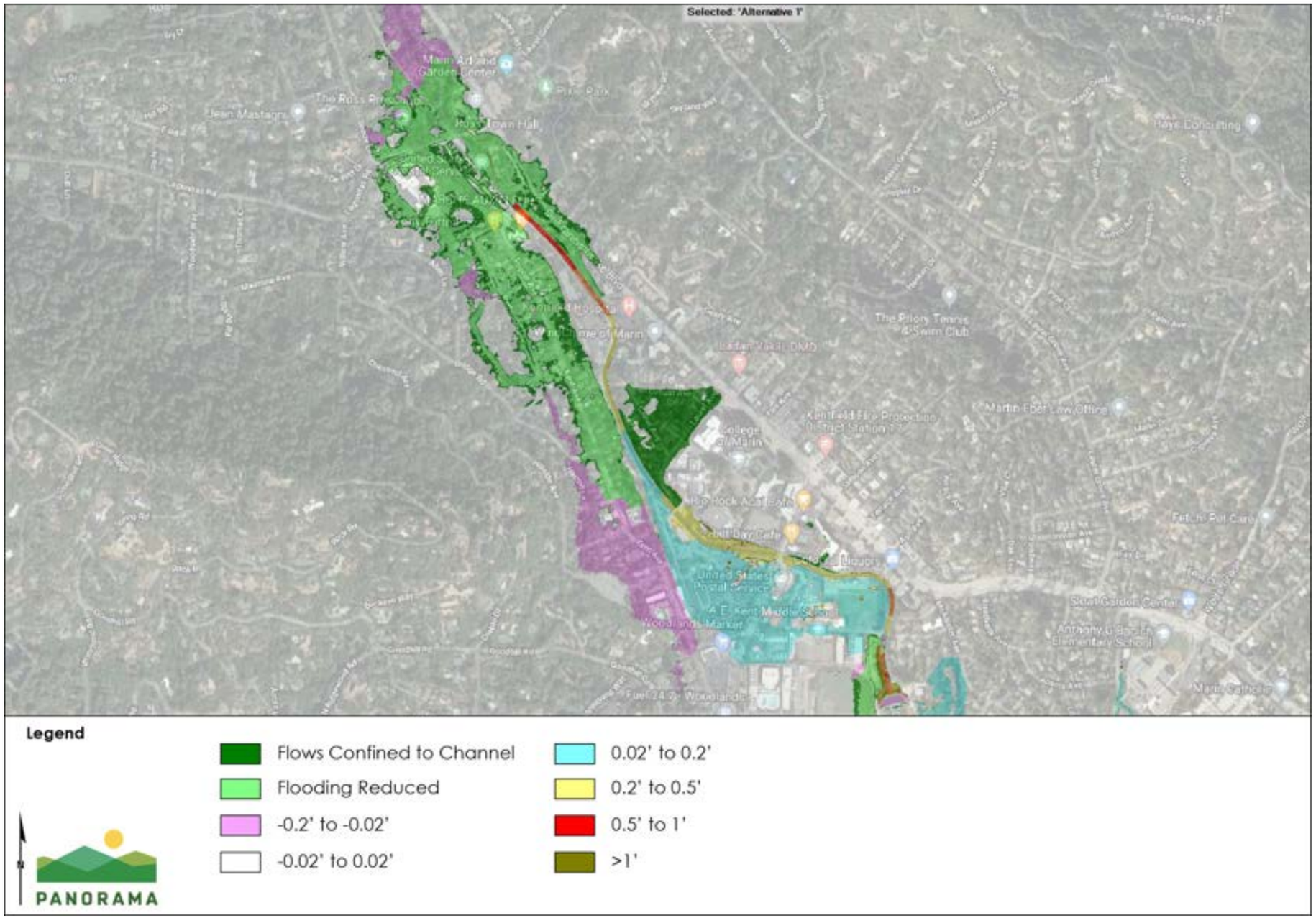
Source: (GHD, 2021)

Figure 2-8 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 10-Year Flood Event (Lower Corte Madera Creek)



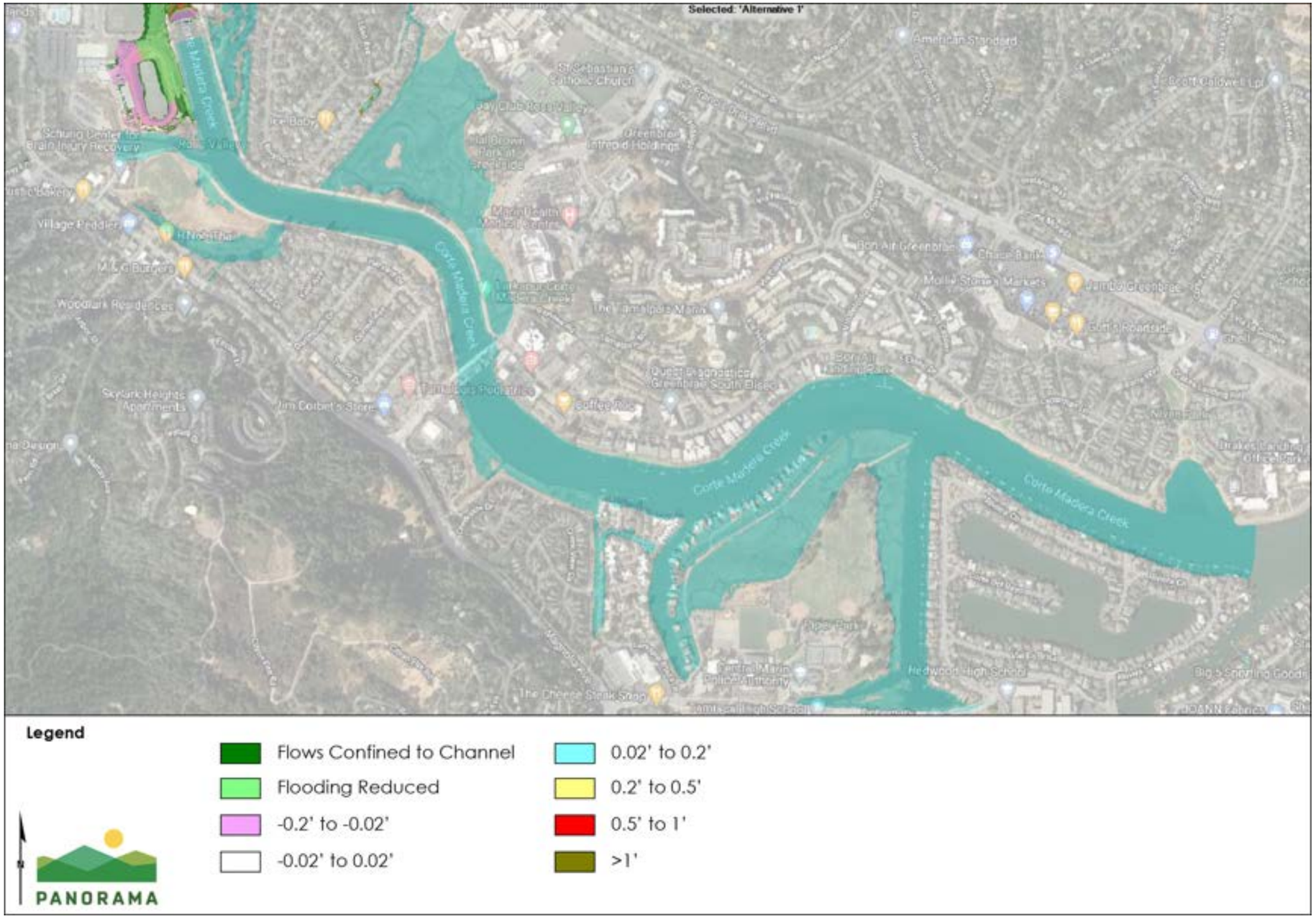
Source: (GHD, 2021)

Figure 2-9 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 25-Year Flood Event (Upper Corte Madera Creek)



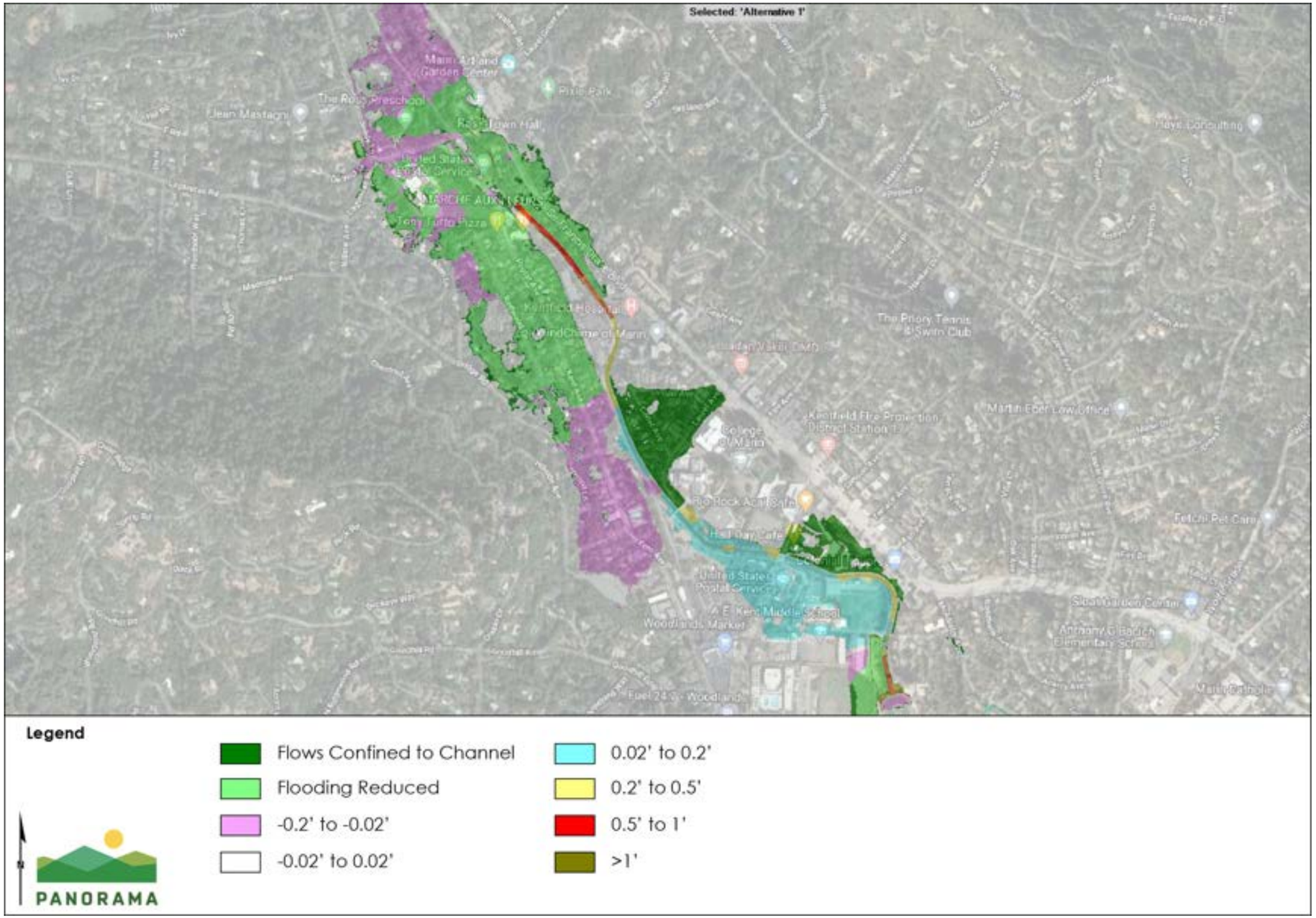
Source: (GHD, 2021)

Figure 2-10 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 25-Year Flood Event (Lower Corte Madera Creek)



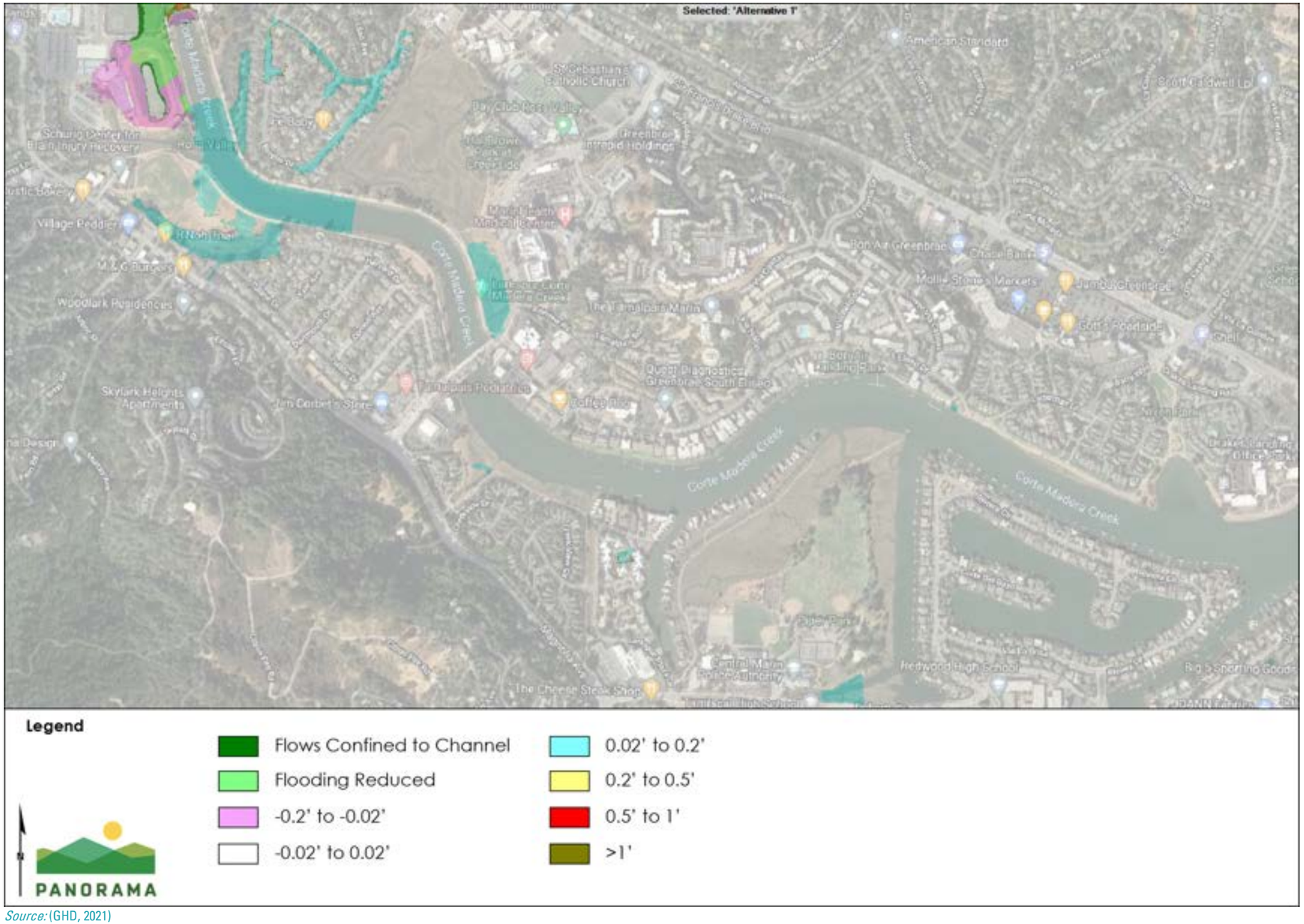
Source: (GHD, 2021)

Figure 2-11 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 100-Year Flood Event (Upper Corte Madera Creek)



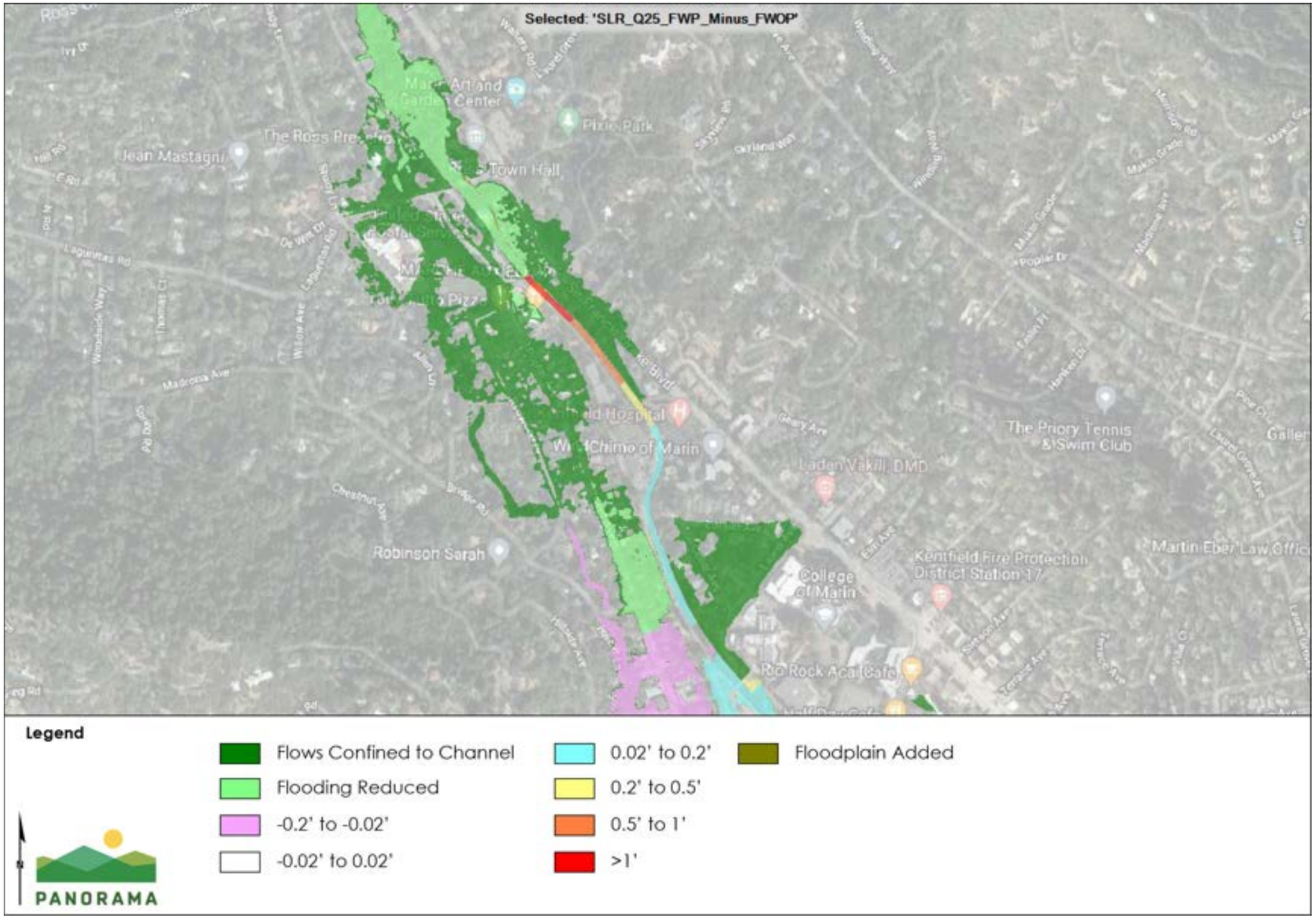
Source: (GHD, 2021)

Figure 2-12 Alternative 1 Changes in Water Surface Elevation from Future Conditions, 100-Year Flood Event (Lower Corte Madera Creek)



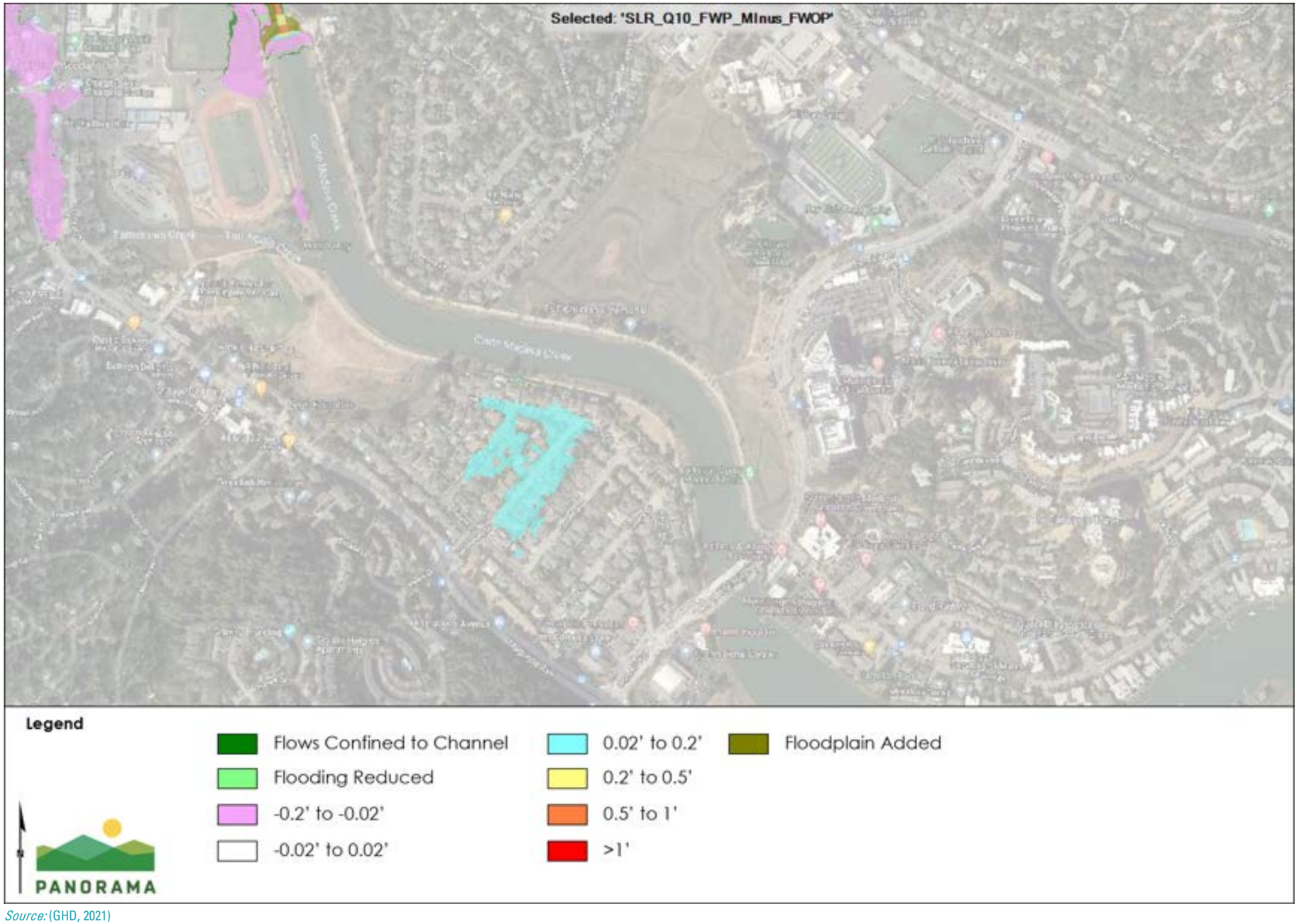
Source: (GHD, 2021)

Figure 2-13 Alternative 1 Changes in Water Surface Elevation Year 2100, 10-Year Flood Event (Upper Corte Madera Creek)



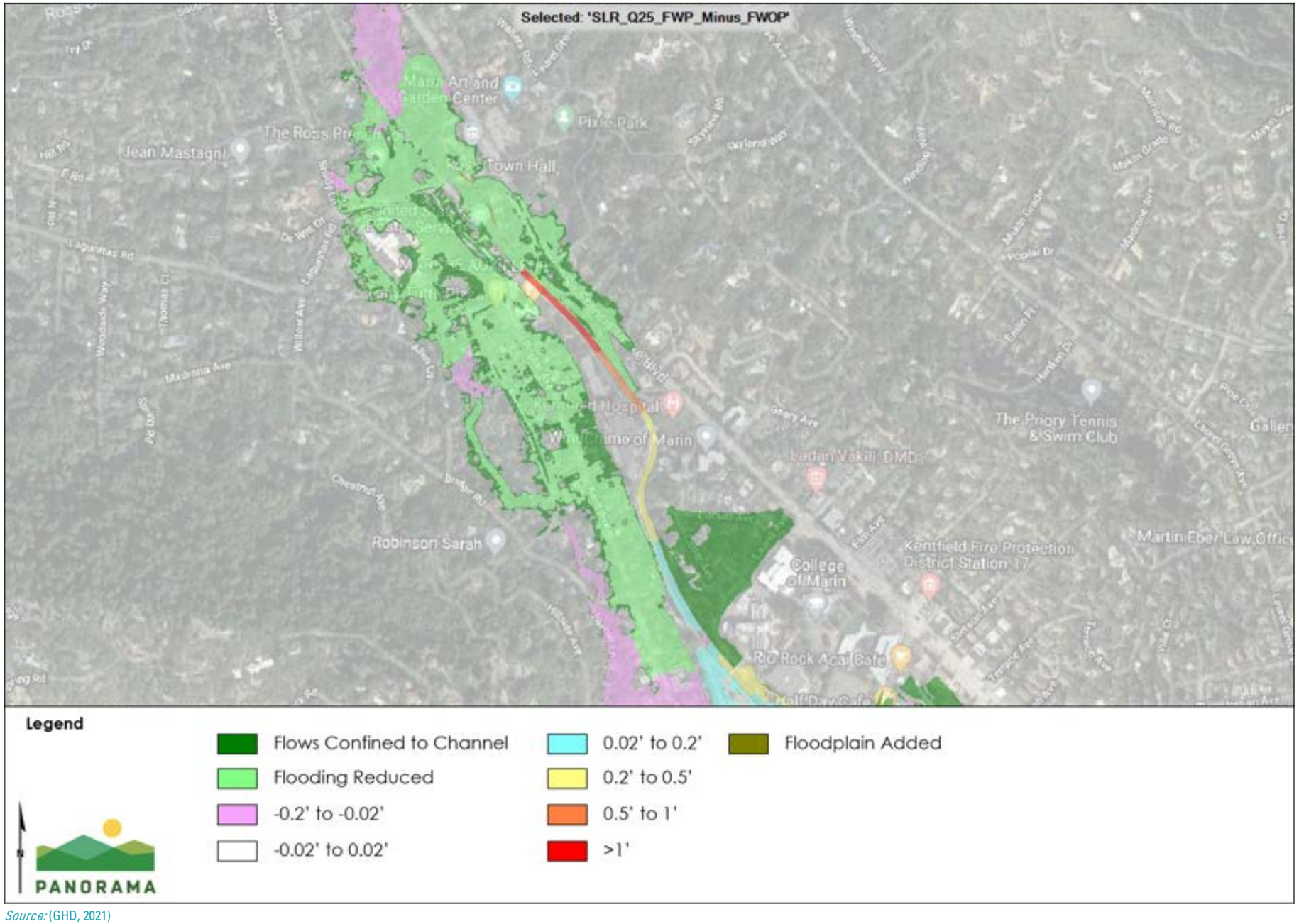
Source: (GHD, 2021)

Figure 2-14 Alternative 1 Changes in Water Surface Elevation Year 2100, 10-Year Flood Event (Lower Corte Madera Creek)



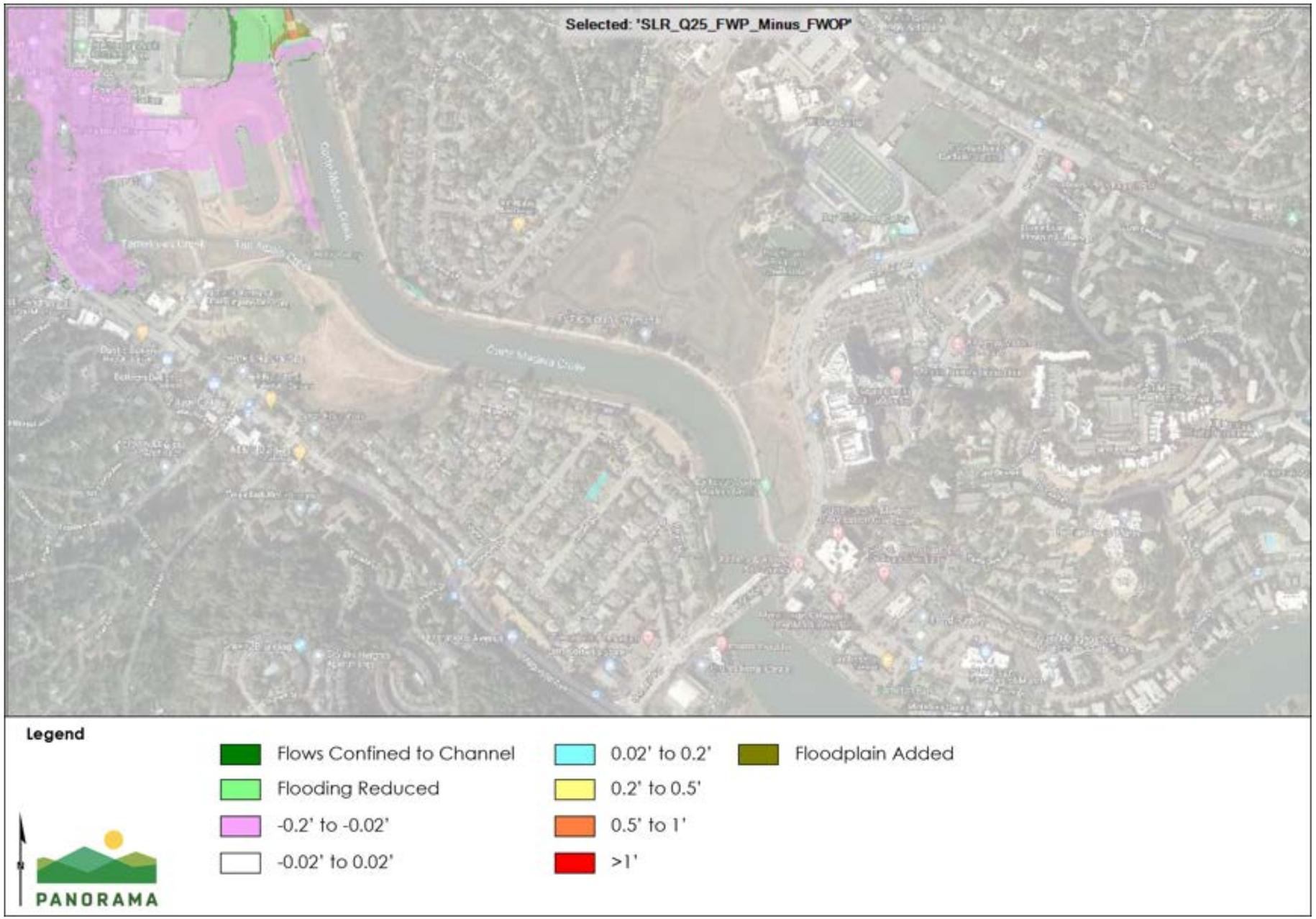
Source: (GHD, 2021)

Figure 2-15 Alternative 1 Changes in Water Surface Elevation Year 2100, 25-Year Flood Event (Upper Corte Madera Creek)



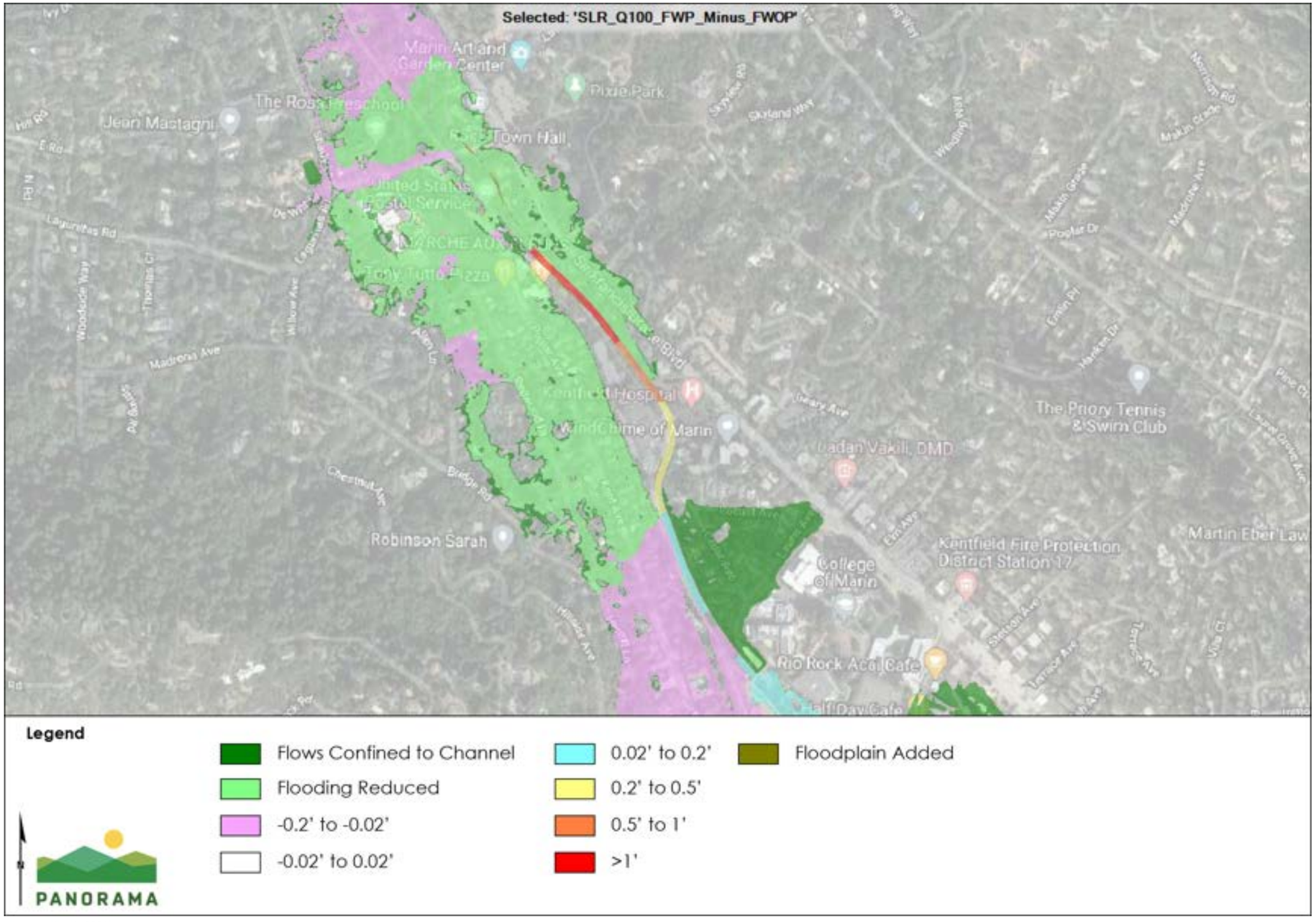
Source: (GHD, 2021)

Figure 2-16 Alternative 1 Changes in Water Surface Elevation Year 2100, 25-Year Flood Event (Lower Corte Madera Creek)



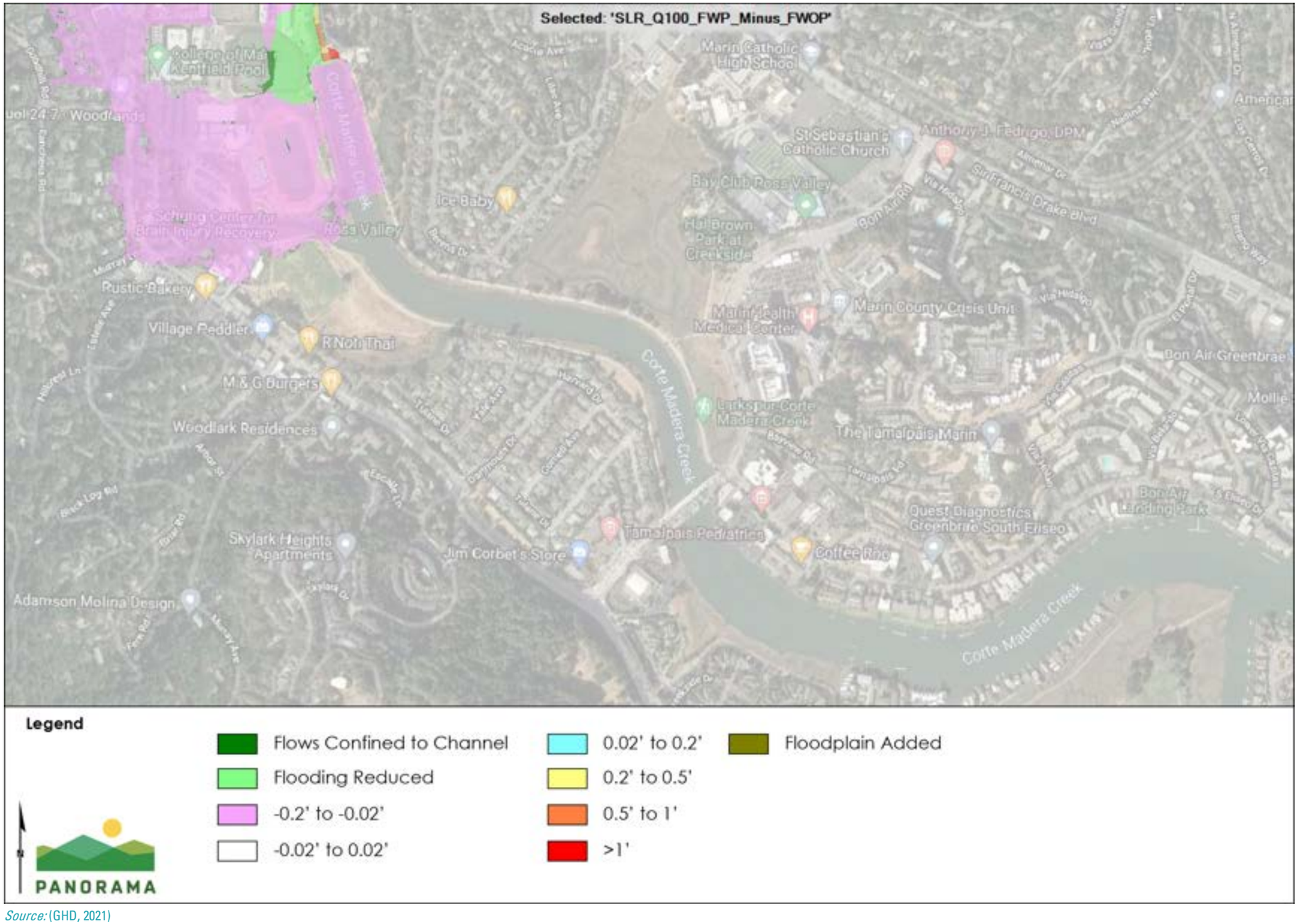
Source: (GHD, 2021)

Figure 2-17 Alternative 1 Changes in Water Surface Elevation Year 2100, 100-Year Flood Event (Upper Corte Madera Creek)



Source: (GHD, 2021)

Figure 2-18 Alternative 1 Changes in Water Surface Elevation Year 2100, 100-Year Flood Event (Lower Corte Madera Creek)



Source: (GHD, 2021)

2.3 State, Regional, and Local Agencies

Comment Letter A1

STATE OF CALIFORNIA — GAVIN NEWSOM, *Governor*

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

Established in 1938

JENNIFER LUCCHESI, *Executive Officer*
(916) 574-1800 *Fax* **(916) 574-1810**
California Relay Service TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1890**

March 16, 2021

File Ref: SCH # 2020080353

Joanna Dixon
Marin County Flood Control and Water Conservation District
c/o: Panorama Environmental, Inc.
717 Market Street, Suite 650
San Francisco, CA 94103

VIA ELECTRONIC MAIL ONLY (cortemaderacreek@marincounty.org)

Subject: Draft Environmental Impact Report (EIR) for Corte Madera Creek Flood Risk Management Project, Phase 1, Marin County

Dear Joanna Dixon:

The California State Lands Commission (Commission) staff has reviewed the Draft EIR for the Corte Madera Creek Flood Risk Management Project, Phase 1 (Project), which is being prepared by the Marin County Flood Control and Water Conservation District (District). The District, as the public agency proposing to carry out the Project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The Commission is a trustee agency for projects that could directly or indirectly affect State sovereign land and their accompanying Public Trust resources or uses. Additionally, because the Project involves work on State sovereign land, the Commission will act as a responsible agency. Commission staff requests that the District consult with us before completing the EIR, as required by Public Resources Code section 21153, subdivision (a), and the California Code of Regulations, title 14 (State CEQA Guidelines) section 15086, subdivisions (a)(1) and (a)(2).

Commission Jurisdiction and Public Trust Lands

The Commission has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The Commission also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, subd. (c); 6009.1; 6301; 6306). All tidelands and submerged lands granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The state holds these lands for the benefit of all people of the state for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

After review of the information contained in the Draft EIR, Commission staff has determined that the waterway, over which the proposed Project will extend, includes State-owned sovereign land, as specified above. On April 25, 1968, the Commission authorized Lease No. PRC 3926 to the Marin County Flood Control and Water Conservation District for the construction of a flood control channel northwesterly of the Bon Air Bridge. This lease expired in 2017. Therefore, a new lease is required. Please visit the Commission's website at https://www.slc.ca.gov/leases-permits/ for more information on submitting an application via the Commission's Online System for Customer Applications and Records (OSCAR).

Project Description

The District proposes this Project with the primary goal to reduce the frequency and severity of flooding in the communities of Ross and Kentfield. The objectives of the Project include:

1. Flood Risk Reduction: Reduce overall flood inundation extent and depth in the Town of Ross and Kentfield areas.

2. Environmental Benefits: Improve fish passage, natural creek processes, and fish and riparian habitat adjacent to the creek.

3. Public Access and Recreational Quality: Maintain public access along the creek via the multi-use path and enhance the recreational experience and amenities along the Creek corridor to meet Town of Ross and Kentfield area community needs.

4. Operational Reliability: Improve operational reliability and reduce long-term maintenance costs through improving channel stability and protecting existing utilities.

5. Regulatory Compliance: Comply with local, state, and federal environmental laws and regulations.

6. Fiscally Responsible: Implement a flood risk reduction project that can be accomplished with local and grant funding and reasonably foreseeable grant

funding opportunities.

From the Project Description, Commission staff understands that the Project would include the following component that has the potential to affect State sovereign land:

- Unit 2. Enhancement of the creek habitat by replacing the concrete channel with an earthen channel and vegetation downstream of Stadium Way. Submerged lands downstream of Stadium Way are considered State sovereign land. Modifying the channel would include removal of the concrete channel and installation of vegetated and unvegetated rock slope protection.

Per the Draft EIR, Alternative 2 would be the environmentally superior alternative because it would avoid the impacts related to recreation, hazards, and transportation from increased flooding on Bike Route 20. Alternative 2 also would reduce the impact from creating a new pedestrian access to the creek, and would allow increased riparian planting and infiltration of rainfall due to construction of an elevated boardwalk instead of a paved pathway. Alternative 2 also would meet all Project objectives and feasibility criteria.

Environmental Review

Commission staff requests that the District consider the following comments to ensure that impacts to State sovereign land are adequately analyzed for the Commission's use of the certified EIR to support a future lease approval for the Project.

Climate Change

1. Page 3.9-4 correctly documents Commission staff's previous comment on sea-level rise, and page 3.9-20 contains sea-level rise projections. However, the impact analysis in the Hydrology and Water Quality section (page 3.9-37) does not clearly detail a comparison between the proposed Project components and sea-level rise. Instead, it suggests the reader look up additional information from the 2018 Appendix A of the U.S. Army Corps of Engineers Draft EIS/EIR.

   The suggested Appendix A is a technical report and uses conflicting alternative names (A, B, F, G, and J, vs. the Alternatives 1, 2, and 3 in this EIR), which may make it difficult for the public to understand how the proposed Project would address sea-level rise long term. To assist the reader in comprehension, Commission staff suggests that Section 3.9 incorporate detailed information on how sea-level rise was addressed in each major component of the Project design and clearly state how long the Project is anticipated to be effective against sea-level rise. As noted in our previous request, "Commission staff will need to ascertain what adaptation strategies are planned during the projected life of the Project and what Project modifications were incorporated into the Project planning that will eliminate or reduce potentially adverse impacts from sea-level rise, including adverse impacts on public access."

A1-1

Tribal Cultural Resources

2. Mitigation Measure (MM) 3.4-2 applies to the discovery of archeological resources; however, a Tribal cultural resource is defined to include "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe," not just archaeological resources (Pub. Resources Code, § 21074, subd. (a)). The Draft EIR states (Table 3.14-2) that the Federated Indians of Graton Rancheria accepted MM 3.4-2; however, it does not discuss whether the Tribe determined the existence of any non-archaeological Tribal cultural resources within the Project area. Commission staff requests this information be included in the EIR.

   If this determination has not been made, Commission staff requests that MM 3.4-2 be modified to include a Native American monitor to assess any potential impacts to Tribal Cultural Resources prior to Project implementation and during all Project activities. In addition, Commission staff requests that MM 3.4-2 require preparation of an Unanticipated Discoveries Evaluation and Treatment Plan that includes a process for determining what procedures would be implemented for discoveries that cannot be protected in place.

A1-2

Thank you for the opportunity to comment on the Draft EIR for the Project. As a responsible and trustee agency, Commission staff will need to rely on the certified EIR for the issuance of any lease as specified above and, therefore, we request that you consider our comments prior to certification of the Final EIR. Please send copies of future Project-related documents, including electronic copies of the Final EIR, signed Resolution, Mitigation and Monitoring Program, Notice of Determination, CEQA Findings and, if applicable, Statement of Overriding Considerations when they become available.

Please refer questions concerning environmental review to Cynthia Herzog, Senior Environmental Scientist, at (916) 574-1310 or cynthia.herzog@slc.ca.gov. For questions concerning the Commission's policies on Tribal cultural resources, please contact Jennifer Mattox, the Commission's Tribal Liaison at (916) 574-0748 or Jennifer.Mattox@slc.ca.gov. For questions concerning Commission leasing jurisdiction, please contact Al Franzoia, Public Land Management Specialist, at (916) 574-0992 or al.franzoia@slc.ca.gov.

Sincerely,

Nicole Dobroski, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
J. Mattox, Commission
A. Franzoia, Commission
C. Herzog, Commission

2.3.1 Response to Comment Letter A1: California State Lands Commission

A1-1 The commenter states that the Hydrology and Water Quality section of the Draft EIR does not describe how the proposed project would address sea-level rise over the long term.

The proposed project would address flooding from Corte Madera Creek, and sea-level rise adaptation is not an objective of the project. However, as described on page 2-23, 2-43, and 3.9-47 of the Draft EIR, the lower College of Marin concrete channel removal and restoration is being designed to be a natural, self-maintaining creek ecosystem, resilient to sea-level rise and climate change. In particular the removal of the concrete channel walls at the lower College of Marin, below Stadium Way, would create salt marsh habitat that would be adapted and resilient to sea level rise. As discussed on page 3.9-61 of the Draft EIR, the project will not exacerbate sea-level rise. The future condition modeling includes an intermediate level of sea-level rise. The future condition modeling results, with the more recent CNRA projections for year 2100 sea-level rise, are shown for Alternative 1 in the figures in Master Response 3. As indicated in these figures, the project still would meet the objective of reducing flood risk on Corte Madera Creek with year 2100 sea-level rise conditions.

A1-2 The commenter states that the Draft EIR does not discuss the existence of any non-archaeological tribal cultural resources within the project area and requests changes to Mitigation Measure 3.4-2.

The results of Native American consultation are discussed on page 3.14-2 of the Draft EIR. The District consulted with the Federated Indians of Graton Rancheria (FIGR) on the project. The District received no information from FIGR regarding identification of tribal cultural resources. On December 8, 2020, FIGR accepted the Draft EIR Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources and the District concluded consultation on the project. Additionally, Mitigation Measure 3.4-2 has been revised as follows in response to State Lands comment to include preparation of an Unanticipated Discoveries Evaluation and Treatment Plan. This change to the mitigation measure is a minor change to strengthen an existing mitigation measure and is not the result of a new or more severe significant impact and recirculation of the Draft EIR is not required.

> **Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources.**
>
> If evidence of any subsurface archaeological features or deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find, and the finds shall be protected until they are examined by a qualified archaeologist. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or

shellfish remains; stone-milling equipment (e.g., mortars, pestles, handstones, milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls and deposits of metal, glass, and/or ceramic refuse. The District shall retain a qualified archaeologist who meets the U.S. Secretary of the Interiors professional qualifications in archaeology to assess the significance of the find and make recommendations for further evaluation and treatment as necessary. A Native American representative from a traditionally and culturally affiliated tribe will be notified and invited to assess the find if the artifacts are of Native American ancestry and determined to be more than an isolated find. If the discovery is in an area below Stadium Way and on lands under the jurisdiction of California State Lands Commission, that agency shall be notified. Any treatments and disposition of any artifacts uncovered under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission before the treatment is implemented.

If, after evaluation, a resource is considered a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in PRC Section 21074), all preservation options shall be considered as required by CEQA (see CEQA Guidelines Section 15126.4 and PRC 21084.3), including possible capping, data recovery, mapping, or avoidance of the resource. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil. Work in the area may resume, at the direction of the District, upon completion of treatment. An Unanticipated Discoveries Evaluation and Treatment Plan shall be prepared before construction that details the procedures for dealing with unanticipated discoveries, including procedures that would be implemented for such discoveries that cannot be protected in place. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.

Comment Letter A2

Water Boards

San Francisco Bay Regional Water Quality Control Board

Sent via electronic mail: No hard copy to follow

March 17, 2021

Marin County Flood Control and Water Conservation District
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903
Attn: Joanna Dixon
E-mail: cortemaderacreek@marincounty.org

Subject: Comments on the Draft Environmental Impact Report for the Corte Madera Creek Flood Risk Management Project, Phase 1, Marin County

Dear Ms. Dixon:

The San Francisco Bay Regional Water Quality Control Board (Water Board) appreciates the opportunity to comment on the Draft Environmental Impact Report (DEIR) for the Corte Madera Creek Flood Risk Management Project, Phase 1 (Project). The Water Board has been an active partner through the Project's planning, design, and now regulatory compliance processes, and appreciates the Marin County Flood Control and Water Conservation District's (District's) willingness to collaborate with the Water Board and other resource and regulatory agencies.

In this letter, we would like to express our concerns with Alternative 1: Reduced Footprint – Avoid Frederick Allen Park (Alternative 1) and our support for the implementation of the proposed Project, Alternative 2: Boardwalk in Frederick Allen Park (Alternative 2) or Alternative 3: Reduce Concrete and Increase Natural Materials (Alternative 3). A2-1

Alternative 1: Avoid Frederick Allen Park

Alternative 1 would avoid the concrete channel removal and floodplain restoration in Frederick Allen Park and instead construct four larger fish resting pools within the existing concrete channel adjacent to the park. This would substantially reduce the Project's benefits to the stream and riparian habitat and the species it supports as well as decrease the flood benefits of the Project. Though the construction of fish resting pools would enhance fish passage, it is unclear whether the Project can adequately compensate for impacts to aquatic life, habitat and water quality associated with the other components, if the stream and floodplain restoration of Frederick Allen Park is avoided. A2-2

The floodwalls proposed in Unit 3 (floodwall segments 2 & 3) will permanently remove a large number of riparian trees that provide ecological functions to the stream, such as A2-3

shade, organic material, etc. The Project appears to rely on the Frederick Allen Park stream and floodplain restoration component to mitigate these impacts and install replacement trees. If the Frederick Allen Park portion of the Project is not constructed, additional mitigation for floodwalls and permanent removal of riparian trees will be required for issuance of a 401 WQC to compensate for the permanent impacts on stream temperature and water quality. The Water Board requires that impacts to riparian trees be mitigated through the installation of replacement trees within a similar length riparian corridor. The further away these replacement trees are from the impact site, the larger the replacement/mitigation ratio (mitigation area or #: impact area or #) becomes. A2-3 cont.

If alternative 1 is implemented, this would be a devastating missed opportunity to implement a groundbreaking ecologically engineered flood control project that includes significant long-term benefits to aquatic life, habitat and water quality as well as flood protection. The residents of the Town of Ross would miss a unique opportunity to integrate and enrich their park and lives with the beautiful and diverse ecosystem of Corte Madera Creek and become a leading example of a community that works together with nature to provide the solution to flooding issues that are attributed to a long history of development and infrastructure encroachment and confinement on Corte Madera Creek. A2-4

Inclusion of Fredrick Allen Park Creek Restoration

The Water Board fully supports the Project as proposed and Alternatives 2 and 3, which include the stream and floodplain restoration at Fredrick Allen Park. We are in favor of the elevated boardwalk included in Alternative 2, which would allow increase infiltration and minimize disturbance to the restored floodplain. We are also in favor of the use of alternative materials other than concrete included in Alternative 3, but would want to review the potential benefits compared to impacts on riparian trees in more detail before making a final determination. Our primary focus, however, is the inclusion of the stream and floodplain restoration at Fredrick Allen Park. A2-5 A2-6 A2-7 A2-8

The concrete removal at Fredrick Allen Park portion of the Project provides significant enough ecological benefits to potentially allow us to review the Project from a more wholistic view as ecological restoration and enhancement. This could potentially eliminate our impact and mitigation concerns and would simplify the 401 WQC process. A2-9

Marin County boasts a robust history of environmental activism that has resulted in the majority of their major waterways being left as natural channels with mature and highly valuable riparian and stream habitat. This portion of Corte Madera Creek is an unfortunate exception that has been constrained and contained in a ridged concrete structure, permanently eliminating and continually impacting many creek functions of a very important stream system and watershed. The concrete channel permanently prevents riparian, wetland, and floodplain vegetation growth and nutrient cycling. It eliminates infiltration and groundwater interactions, increases flow velocities, and reduces the channels ability to naturally sort and distribute sediment. The concrete A2-10 A2-11

channel severely impacts fish passage and habitat value of a major stream for Steelhead and other salmonids. All these functions and more would be restored if the concrete channel is removed and the stream and floodplain re-constructed as a naturalized reach, enhancing and restoring Corte Madera Creek's many beneficial uses, including cold freshwater habitat, fish migration, preservation of rare and endangered species, fish spawning, warm freshwater habitat, and wildlife habitat.

A2-11 cont.

Including the Fredrick Allen Park restoration would increase flood protection benefits of the project and would provide increase resiliency to climate change. Impervious surfaces from development and infrastructure exacerbate the flood impacts of high intensity storm events, which are becoming more and more frequent as climate change influences atmospheric rivers and rising tides. Natural habitats such as floodplains, wetlands, and tidal marshes are much more resilient to these types of storm events with the added capacity for infiltration and vegetation helping slow and retain flood waters within the floodplain corridor instead of in developed areas.

A2-12

It is our view that the long-term benefits of removing the concrete channel at Fredrick Allen Park far outweigh the impacts of removing riparian canopy and mature oaks in the park. Impacted trees can grow back and be restored to their previous size over time through the restoration and monitoring plan that will be required for permitting. However, not taking this rare opportunity to remove the concrete channel at Fredrick Allen Park will continue to permanently isolate Corte Madera Creek from its natural processes, impact beneficial uses, and keep this valuable resource trapped in its degraded condition. The Water Board fully supports the Project as proposed, which integrates ecological engineering principles to restore habitats that can flourish in flood conditions while also helping to reduce flood impacts on the surrounding developed areas.

A2-13

In closing, we appreciate the progress made towards a Project design that protects the beneficial uses of Corte Madera Creek, and look forward to continuing to work with the District to permit a project that reduces flooding while maximizing water quality benefits in the Corte Madera Creek Watershed. Please contact Nicole Fairley at nicole.fairley@waterboards.ca.gov with any questions or comments.

A2-14

Sincerely,

Nicole Fairley, P.E.
Water Resource Control
Engineer, Watershed Division

Cc: U.S. EPA, Region IX, Jennifer Siu, siu.jennifer@epa.gov

Corps, San Francisco Regulatory Branch:
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RECYCLED PAPER

2.3.2 Response to Comment Letter A2: San Francisco Bay Regional Water Quality Control Board

A2-1 The commenter expresses concerns with Alternative 1: Reduced Footprint – Avoid Frederick Allen Park (Alternative 1) and support for the implementation of the proposed project, Alternative 2: Boardwalk in Frederick Allen Park (Alternative 2) or Alternative 3: Reduce Concrete and Increase Natural Materials.

Refer to Master Response 1 for the rationale behind District staff's recommendation to approve Alternative 1. Refer to Master Response 2 regarding the consideration of a natural material floodwall and the greater impacts of a natural material floodwall.

A2-2 The commenter states that it is unclear whether Alternative 1 can compensate for impacts to aquatic life, water, and water quality if the Frederick Allen Park components are not constructed.

The environmental impacts and benefits of Alternative 1 are discussed in Chapter 5 of the Draft EIR. As discussed in Chapter 5 of the Draft EIR, Alternative 1 would include larger fish resting pools that would increase fish passage success to more than 90 percent. Fish passage success currently is less than 5 percent. Alternative 1 also would include enhancing the natural creek and processes by removing the dysfunctional Denil fish ladder, grading a smooth transition, increasing riparian plantings within the natural creek channel in Unit 4, and increasing saltwater marsh habitat in the lower College of Marin area. Because of the removal of the fish ladder and grading of the channel, an increase in natural channel area will result from project implementation. Alternative 1 will also result in a net removal of fill and increase in creek area from removal of the fish ladder.

A2-3 The commenter states that additional mitigation for tree removal associated with floodwall installation will be required if the Frederick Allen Park portion of the project is not constructed.

Table 2.6-2 in the Draft EIR shows a conservative estimate of tree removal required for installation of the floodwalls in Unit 3 of the project area. The table also shows tree removal estimates, if USACE requires a 15-foot setback from the floodwall. The District currently is proposing to install the new floodwall on top of the existing floodwall. This approach would require substantially less tree removal than indicated in Table 2.6-2 in the Draft EIR; a total of 34 trees would be removed for the entire Alternative 1 construction based on the 60% design. As described in Section 3.3, Biological Resources (page 3.3-14), the riverine vegetation in Units 2 and 3 is sparse and provides little shade to the creek because the vegetation is separated from the creek by a 10-foot-tall concrete floodwall and concrete channel. Mitigation Measure 3.3-2b: Tree Mitigation includes mitigation for tree removal to comply with CDFW, Town of Ross, and Marin County guidelines. The updated tree removal estimate and approach to tree mitigation was included in the application for Section 401 Water Quality Certification.

A2-4 The commenter states that if Alternative 1 is implemented instead of the project, a huge opportunity would be missed to implement a groundbreaking ecologically engineered flood control project that includes significant long-term benefits to aquatic life, habitat and water quality as well as flood protection.

The commenter's preference for the proposed project is acknowledged. Refer to Master Response 1 regarding lack of Town of Ross support for the riparian restoration at Frederick Allen Park.

A2-5 The commenter states that they fully support the project as proposed and Alternatives 2 and 3, which include the stream and floodplain restoration at Fredrick Allen Park.

The commenter's preference for the floodplain restoration at Frederick Allen Park is acknowledged. Refer to Master Response 1 regarding lack of Town of Ross support for the riparian restoration at Frederick Allen Park.

A2-6 The commenter states that they are in favor of the elevated boardwalk included in Alternative 2, which would allow increase infiltration and minimize disturbance to the restored floodplain.

The commenter's preference for Alternative 2 is acknowledged. Refer to Master Response 1 regarding lack of Town of Ross support for the riparian restoration at Frederick Allen Park, including Alternative 2.

A2-7 The commenter states they are in favor of the use of alternative materials other than concrete included in Alternative 3.

The commenter's preference for Alternative 3 is acknowledged. Refer to Master Response 2 regarding the constraints to a natural material floodwall.

A2-8 The commenter states that their primary focus is the inclusion of the stream and floodplain restoration at Fredrick Allen Park.

The commenter's preference for stream and floodplain restoration at Frederick Allen Park is acknowledged. Refer to Master Response 1 regarding lack of Town of Ross support for the riparian restoration at Frederick Allen Park

A2-9 The commenter states that the concrete removal at Fredrick Allen Park portion of the project provides significant enough ecological benefits to potentially allow us to review the project from a more holistic view as ecological restoration and enhancement. This could potentially eliminate our impact and mitigation concerns and would simplify the 401 Water Quality Certification process.

Refer to response to comment A2-2 regarding Alternative 1 benefits to water resources, including fish passage, removal of the existing fish ladder fill, expansion of the creek,

increased riparian planting in Unit 4, and increased saltwater marsh habitat in the lower College of Marin area.

A2-10 The commenter states that the portion of Corte Madera Creek covered by the project has been constrained and contained in a rigid concrete structure, permanently eliminating and continually impacting many creek functions of a very important stream system and watershed.

This comment describes the existing conditions of Corte Madera Creek, not the impacts of the project. The EIR evaluates impacts of the project, not the existing conditions or the effects of past projects.

A2-11 The commenter states that concrete channel impacts fish passage and habitat value for steelhead and other salmonids and these functions and more would be restored if the concrete channel is removed and the stream and floodplain re-constructed as a naturalized reach.

This comment describes the existing condition of Corte Madera Creek. Refer to response to comment A2-2.

A2-12 The commenter states that including the Fredrick Allen Park restoration would increase flood protection benefits of the project and would provide increased resiliency to climate change.

The increased flood protection benefits of the proposed project were documented in the Draft EIR and are discussed in Master Response 1. Both the proposed project and Alternative 1 would include increased saltwater marsh habitat in the lower College of Marin area, which provides increased resiliency to climate change.

A2-13 The commenter believes that the long-term benefits of removing the concrete channel at Fredrick Allen Park outweigh the impacts of removing the tree canopy and mature oaks in the park because the trees will grow back; not removing the concrete channel will continue to isolate the creek from its natural processes and impact beneficial uses.

The comment discusses the impact of the existing condition and not the impact of the project. Refer to Master Response 1 regarding public support for Alternative 1. Alternative 1 would not preclude or conflict in any way with future Frederick Allen Park floodplain restoration should the concrete channel removal be supported by the community and Town of Ross in the future. Lack of public support has delayed any flood control project from happening in the area for 50 years. The Alternative 1 improvements to fish passage and flood control are substantial and are implementable within the project time schedule. The District staff are recommending the publicly-supported Alternative 1 so that the Alternative 1 improvements can be achieved in the near term. As noted in Draft EIR Chapter 5, Alternative 1 would meet most of the basic project objectives.

A2-14 The commenter appreciates the project design progress and protection of Corte Madera Creek beneficial uses.

This commenter's interest in protecting the beneficial uses of Corte Madera Creek is acknowledged and have been considered in the design process.

Comment Letter A3

COUNTY OF MARIN

MARIN COUNTY PARKS
Preservation • Recreation

MARIN COUNTY
PARKS
PRESERVATION RECREATION

OPEN SPACE DISTRICT
REGIONAL PARKS & PATHWAYS
COMMUNITY PARKS
LANDSCAPE SERVICES

Max Korten
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March 17, 2021

Joanna Dixon
Project Manager
3501 Civic Center Drive
Suite 304
San Rafael, CA 94903.

Re: Comments to Corte Madera Creek Flood Risk Management Project - Phase 1 Draft EIR

Dear Joanna,

Thank you for the opportunity to provide comments in response to the Corte Madera Creek Flood Risk Management Project, Phase 1 Draft EIR.

Marin County Parks has a vested interest in this project as we manage and/or maintain approximately 1.6 miles of the Corte Madera Multi-use pathway (Bike Route 20) between Hal Brown park and Ross Town Commons within the proposed project's scope. A3-1

We generally support the overall project objectives, especially as they relate to potential enhanced public recreation access along the creek corridor.

Recreation preservation and Pathway realignment

- Marin County Parks supports the proposed relocation of the multi-use pathway to the left bank within Unit 2 and those alternatives which will create the most recreational benefit for such relocation. A3-2
- Any proposed alternatives or modifications to the channel walls should not inhibit potential recreational opportunities, nor negatively impact existing multi-use path right-of-way or the existing recreation corridor as an important community recreation resource. A3-3
- All path designs, supporting elements, alignments and connections shall be designed to meet all current Americans with Disabilities Act (ADA) code requirements. A3-4

Construction Closures

- Parks understands the complexity of closures required for construction and recommends additional time be added beyond the 14-day noticing. Utilizing the project's public information program, allow for sufficient time to coordinate and communicate with key stakeholders and the public. A3-5
- Ensure all pathway stakeholders are informed of temporary closure plans and provide opportunity for input and feedback related to temporary directional signage and final re-routing. A3-6

- Temporary pathway and supporting signage during construction should meet all accessibility requirements as set forth under the Americans with Disabilities Act and CBC Title 24. We recommend the District to communicate and coordinate with the County Disability Coordinator. A3-7
- Consider installation of bike/pedestrian counters along Route 20 pre-construction, during the temporary closure of unofficial pathways, and post-construction to collect data on use. A3-8
- We support use of flaggers during construction to support and reinforce safety of bicycle, pedestrian, and vehicular traffic. A3-9

Operation and Maintenance

- Consider potential impacts (and solutions) of proposed tree plantings to pathway integrity and user safety (roots). A3-10
- Provide opportunity for input and feedback related to proposed tree selection and irrigation design. A3-11
- Pathway materials, design profiles, and supporting infrastructure should be selected with consideration of both short and long-term potential maintenance impacts and with input from Marin County Parks. A3-12
- Additional material and maintenance consideration should be directed to those areas which may be inundated by flood zones. A3-13

Aesthetics and Visual Resources

- Proposed fencing/guardrails should take into account visual impacts and be constructed of materials other than 'chainlink' to allow for improved aesthetic appeal as well as allowing for a stronger and more direct visual connection to the creek. A3-14
- Consider flood wall extension designs which may allow for future creative interventions or artistic installations (where appropriate) such as concrete forms, painted and/or mosaic murals which would enhance the user experience and provide for potential interpretive and educational moments. A3-15
- All wall heights and/or fencing/guardrails shall be designed to meet current safety regulations for bicycles and pedestrians. A3-16

Thank you for this opportunity and for consideration of our comments. We look forward to the release of the Final EIR document.

Sincerely,

Tara McIntire
Principal Landscape Architect
Marin County Parks

Cc: Max Korten – Director/General Manager
Chris Chamberlain – Assistant Director
Jim Chayka – Superintendent
Brian Sanford - Superintendent

2.3.3 Response to Comment Letter A3: Marin County Parks

A3-1 The commenter states they have a vested interest in the project and that they generally support the project objectives.

This commenter's support for the project objectives is acknowledged.

A3-2 The commenter states their support of the proposed relocation of the multi-use pathway and those alternatives which will create the most recreational benefit for such relocation.

This commenter's support for recreational benefits is acknowledged. Relocation of the multi-use pathway within Unit 2 is not proposed as part of the project. However, the floodwall in Unit 2 would not preclude and could accommodate relocation of the multi-use pathway to the left bank in the future, as part of a separate effort.

A3-3 The commenter states that alternatives or modifications to the channel walls should not inhibit potential recreational opportunities or impact the existing multi-use path.

As described on pages 3.12-10 and 3.12-11 of the Draft EIR, project operation would not impact Bike Route 20 (existing multi-use path) or unnamed paths #1, #2, and #3. Access along Bike Route 20 would be maintained during construction, except for the portion in Frederick Allen Park, and access along the unnamed paths would be restored after construction is complete.

A3-4 The commenter states that all path designs, supporting elements, alignments and connections shall be designed to meet all current Americans with Disabilities Act (ADA) code requirements.

The only path modification included as a part of the proposed project involved realignment of the pathway in Frederick Allen Park. Any path modification would be designed to meet ADA requirements. See Master Response 1 regarding staff recommendation to adopt for Alternative 1, which does not involve modification of the pathway.

A3-5 The commenter requested additional time for public noticing beyond the 14 days.

Mitigation Measure 3.13-1: Traffic Management has been revised as shown under response to comment A3-7, to increase the notification period to 20 days in response to the comment.

A3-6 The commenter suggests that pathway stakeholders be informed of temporary closure plans and given the opportunity to provide input and feedback.

The Draft EIR included Mitigation Measure 3.13-1: Traffic Management, which requires preparation of a Traffic Management Plan (TMP), which would include a detour plan for bicycle and pedestrian traffic, showing the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin parking lot to Ross Common. The

TMP also would implement a public information program to notify interested parties of the impending construction activities, using print media, radio, and/or web-based messages and information. See also Master Response 1 regarding staff recommendation to adopt Alternative 1, which would not require closure of Bike Route 20.

A3-7 The commenter states that the temporary pathway detour and associated signage during construction should meet all accessibility requirements as set forth under the Americans with Disabilities Act and CBC Title 24.

Mitigation measure 3.13-1: Traffic Management has been revised as follows to indicate that the temporary pathway detour and associated signage during construction would meet all accessibility requirements stated under the Americans with Disabilities Act and CBC Title 24. The change to the mitigation measure is provided for clarification in response to comment. See also Master Response 1 regarding staff recommendation to adopt Alternative 1, which would not require a temporary pathway detour.

Mitigation: Mitigation Measure 3.13-1: Traffic Management

Prior to initiation of construction, the project contractor(s) shall use a qualified traffic engineer to prepare a Traffic Management Plan (TMP). The TMP shall be developed on the basis of detailed design plans. The TMP shall be reviewed and approved by the District and agencies with jurisdiction over roadways affected by project construction activities prior to construction. Once approved, the TMP shall be incorporated into the contract documents specification. The TMP shall include, but not necessarily be limited to, the elements listed below:

- Develop a detour plan for bicycle and pedestrian traffic that shows the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin Parking lot to Ross Common.
- <u>Post temporary Bike Route 20 detour and associated signage that meets all the accessibility requirements stated under the Americans with Disabilities Act and CBC Title 24.</u>
- Post signs providing public notice of detours at least ~~14~~ <u>20</u> days prior to temporary bike route closure.
- Provide flaggers at the tennis courts within Frederick Allen Park to provide safe pedestrian access to the tennis courts.
- Control and monitor construction-vehicle movements by enforcing standard construction specifications through periodic on-site inspections.
- Install traffic-control devices where traffic conditions warrant, as specified in the applicable jurisdiction's standards (e.g., the California Manual on Uniform Traffic Control Devices; Part 6: Temporary Traffic Control); flaggers would be used, when warranted, to control vehicle movements.

- Implement a public information program to notify interested parties of the impending construction activities using means such as print media, radio, and/or web-based messages and information.
- Comply with roadside safety protocols to reduce the risk of accidents.
- Maintain access for emergency vehicles at all times. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways.
- Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner as to minimize obstruction to traffic.

A3-8 The commenter suggests that the District consider installation of counters along Bike Route 20.

CEQA requires implementation of mitigation measures that reduce the significant impacts of a project. The installation of traffic counters on Bike Route 20 would not reduce any significant project impacts.

A3-9 The commenter states their support for use of flaggers during construction to reinforce the safety of bicycle, pedestrian, and vehicular traffic.

Mitigation Measure 3.13-1: Traffic Management includes the use of flaggers for pedestrian, bicycle, and vehicular safety as suggested in the comment.

A3-10 The commenter requests consideration for impacts of plantings on the pathway integrity.

The types of trees that were proposed for planting in Frederick Allen Park would be compatible with park use, including the multi-use pathway (Bike Route 20). See Master Response 1 regarding staff recommendation to adopt Alternative 1, which would not involve any plantings in Frederick Allen Park.

A3-11 The commenter states that there should be an opportunity for input and feedback related to the proposed tree selection and irrigation design.

The proposed project would require design review, including review of landscape plans by the Town of Ross, before any tree planting, as discussed in response to comment A5-6 below. The tree selection and irrigation design would be included in the landscape plan. The design review process and landscape plan would include opportunity for public input and feedback. See Master Response 1 regarding staff recommendation to adopt Alternative 1, which would not involve any plantings in Frederick Allen Park.

A3-12 The commenter states pathway materials, design profiles, and supporting infrastructure should consider short and long-term maintenance impacts and be chosen with input from Marin County Parks.

The District would coordinate with Marin County Parks during the pathway design process, if there are any modifications to the pathway. See Master Response 1 regarding staff recommendation to adopt Alternative 1, which would not involve any plantings in Frederick Allen Park.

A3-13 The commenter states that additional material and maintenance consideration should be directed to those areas which may be inundated by flood zones.

The District has considered pathway materials and maintenance requirements in the proposed project design. The pathway would be inundated very infrequently and only during large storm events because the pathway would be elevated above the creek. See Master Response 1 regarding staff recommendation to adopt Alternative 1, which would not involve any plantings in Frederick Allen Park.

A3-14 The commenter states that visual impacts of proposed fencing and guardrails should be considered.

The proposed project would include a split-rail fence in Frederick Allen Park, as discussed on page 2-19 of the Draft EIR. The split-rail fence would be installed along the top of the channel in the park, to prevent encroachment into habitat areas during the vegetation establishment period. The split-rail fence could be removed after the habitat is established.

The floodwall in Units 3 and 2 would be constructed on top of the existing concrete channel wall as a structural extension of the existing channel structure, to provide additional flood control. A fence would be installed on top of the concrete wall as needed for public safety. The fence design would need to consider public safety and maintenance requirements. A fence currently is on top of the concrete wall, and the proposed fence would appear visually similar to the existing fence.

A3-15 The commenter states that the District should consider a design that would allow for murals or other art or education forms along the floodwalls.

The proposed floodwalls in Frederick Allen Park would be approximately 2 feet high and likely would be too short to allow murals. The proposed retaining wall in Frederick Allen Park would be approximately 10 feet high, and the floodwalls in Units 3 would be approximately 2 to 4 feet high and up to 6 feet high in low-lying areas. Murals would not be part of the project objectives, but the proposed project would not preclude future murals, assuming the murals would be consistent with the flood control and habitat objectives.

A3-16 The commenter states that floodwall and fencing heights should be designed to meet current safety regulations for bicycles and pedestrians.

The floodwall and fence heights would be designed to meet all safety standards and requirements.

Comment Letter A4

---------- Forwarded message ---------
From: **Steve Moore** <smoore@rvsd.org>
Date: Wed, Feb 3, 2021 at 4:29 PM
Subject: Comments on Corte Madera Creek Draft EIR, February 2021
To: cortemaderacreek@marincounty.org <cortemaderacreek@marincounty.org>
CC: Dixon, Joanna <JDixon@marincounty.org>, Sandra Guldman <sandra.guldman@gmail.com>

Thank you for the opportunity to comment on the Draft EIR. RVSD has one comment on 3.15 Utilities and Service Systems portion of the document.

A4-1

Page 3.15-2: The sewer line that crosses Corte Madera Creek at the end of Stadium Way passes beneath the concrete channel in a siphon structure near and parallel to the pedestrian bridge, and does not cross the creek on the pedestrian bridge.

Best regards,

Steve Moore, P.E., General Manager

Ross Valley Sanitary District

2960 Kerner Blvd., San Rafael, CA 94901

(415) 870-9764

(415) 730-0089 (cell)

Website: www.rvsd.org

Email: smoore@rvsd.org

Email Disclaimer: https://www.marincounty.org/main/disclaimers

1

2.3.4 Response to Comment Letter A4: Ross Valley Sanitary District

A4-1 The commenter states that the description of the sewer line that crosses Corte Madera Creek at the end of Stadium Way is incorrect and the sewer line passes beneath the concrete channel in a siphon structure near and parallel to the pedestrian bridge.

Page 3.15-2 of the Draft EIR has been revised as follows to reflect the correct alignment of the sewer line.

> RVSD sanitary sewer lines run beneath Corte Madera Creek in a northwest/southeast direction within the project area from the southern end of Unit 4 near the fish ladder to near the end of Unit 2. The sewer lines cross beneath Corte Madera Creek at the approximate location of the fish ladder and at Stadium Way in Unit 2 (refer to Figure 3.15-1 to Figure 3.15-3). The sewer line that crosses Corte Madera Creek at the end of Stadium Way passes beneath the concrete channel in a siphon structure adjacent to the pedestrian bridge. ~~An aboveground sewer pipe crosses the creek on the pedestrian bridge at the end of Stadium Way (Figure 3.15-3).~~

TOWN OF ROSS

Comment Letter A5

March 15, 2021

Marin County Flood Control and Water Conservation District
c/o Joanna Dixon, P.E.
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903

RE: CORTE MADERA CREEK FLOOD RISK MANAGEMENT PROJECT PHASE 1: COMMENTS ON THE FEBRUARY 1, 2021 DRAFT ENVIRONMENTAL IMPACT REPORT

Dear Ms. Dixon:

Thank you for the opportunity to provide comments regarding the Corte Madera Creek Flood Risk Management Project Phase One (the Project) Draft Environmental Impact Report (DEIR) released for public comment on February 1, 2021. The Town of Ross appreciates the outreach efforts of the Marin County Flood Control District staff and will continue to support any planning efforts which facilitate flood risk reduction measures in the Ross Valley basin.

The Town of Ross, as a major stakeholder in the Project, a responsible agency, and as a partner, is concerned over the proposed project's extensive modifications to Frederick Allen Park including the extensive construction activities, extensive tree removal, and unavoidable aesthetic impacts and wants to ensure that the integrity of the information and analysis provided by the EIR for the proposed project and the alternatives is sufficient to adequately evaluate the potential project impacts that are likely to occur within the Town.

EXECUTIVE SUMMARY:

- On page ES-9 the Impact and Mitigation Measure (MM) labels are not consistent with the labels in the Mitigation Monitoring and Reporting Program (MMRP): Impact/MM 3.1-2 and Impact/MM 3.1-3, respectively. In other words, the reference on page ES-9 to the measure requiring the integration of large box into the planting plan and design for Frederick Allen Park should be to MM 3.1-3, not MM 3.1-2 as there is no such mitigation measure 3.1-2 proposed in the DEIR. A5-1
- On page ES-11 under the section ES.5 Summary of Alternatives to the Project, each of the Alternatives (1, 2, and 3) should provide a statement on the long-term impacts on GHG emissions. A5-2
- Page ES-14, ES.8.1 states that the impact to visual quality would be significant and unavoidable for 10 years while the trees grow. This does not appear to be supported by the visual simulations in Chapter 3.1, which show pre-project shading closer to a 20-year growth. A5-3
- On page ES-15 under ES.8.1 Major EIR Conclusions, the increase in water surface elevation within the new riparian channel and resultant backwater flow out to the municipal storm drain system of pipes and channels should be mentioned. A5-4
- The text on Page ES-17 states that mitigation is large tree planting. Page 2-37 references 24" and 36" box trees. A detailed definition of "large tree planting" should be provided, including the beginning height of 24" and 36" box trees. A5-5

P.O. BOX 320, ROSS, CA 94957-0320
415.453.1453 • FAX 415.453.1950
www.townofross.org

1 INTRODUCTION:

- On page 1-5 under the section 1.4.4 Town of Ross, the EIR should be revised to also acknowledge that the project will also require the Town of Ross to approve discretionary Design Review, Building, Grading, and Encroachment Permits. A5-6

2 PROJECT DESCRIPTION:

- On page 2-6, Figure 2.3-2 the Water Year axis should continue through 2019 to demonstrate how the large storms in 2017-2019 compared to other year storms. Same figure to be updated on page 3.9-16, Figure 3.9-2. A5-7
- On page 2-17 figure 2.5-4 should clearly show the existing concrete channel walls on both sides of the channel for ease of reference. A5-8
- On page 2-34 under the section 2.6.4 Grading, the concrete apron at the transition between Unit 3 and Unit 4 should be mentioned and described. A5-9
- On page 2-42 under the section 2.7.2 Maintenance, the maintenance MOU or other process for the condition in Frederick Allen Park where the natural amenities of the new floodplain park will overlap both District and Town of Ross properties/jurisdictions should be mentioned and described. A5-10
- On page 2-42 under the same section, vegetation management should include care and establishment of replacement trees in the floodplain park. A5-11
- On page 2-42 vegetation management goals should include a fourth goal: "Revegetation of park for visual amenity and shade" A5-12
- On page 2-44 Table 2.8-1 should be revised to acknowledge that the project will also require the Town of Ross to approve discretionary Design Review, Grading Permit, Building Permit, and Encroachment Permit. A5-13

3.1 AESTHETICS AND VISUAL RESOURCES:

- Chapter 3.1 uses the Federal Highway Administration Guidelines to evaluate visual quality. For portions of the project within Ross, visual quality should be evaluated as it relates to the Town of Ross design review criteria and standards, Section 18.41.100 of the Town of Ross Municipal Code. A5-14
- On page 3.1-8 Figure 3.1-5 is the same photo as Figure 3.1-4 and does not show what Figure 3.1-5 describes (i.e., Upper Unit 3 Fish Pools from Kentfield Hospital Bridge, Looking Southeast). A5-15
- In Section 3.1.5 on pages 3.1-13 and 3.1-14, the regulatory setting discussion pertaining to the Town should also refer to and discuss the Town's Design Review Ordinance (Town of Ross Municipal Code, Chapter 18.41, including that Ordinance's purpose, application to the project and criteria and standards; and the Aesthetics and Visual Resources impact analysis in DEIR Chapter 3.1 should be revised to analyze the proposed project's consistency with the Design Review Ordinance and impose mitigation necessary to ensure consistency therewith as needed. A5-16
- Page 3.1-15 should include the Ross General Plan policy, "3.2 Landscape Design. Where appropriate, encourage landscape designs that incorporate existing native vegetation, enhance the cohesiveness of the Town's lush, organic landscape and integrate new planting with existing site features," and the Aesthetics and Visual Resources impact analysis in DEIR Chapter 3.1 should be revised to address how the proposed project is or is not consistent with this policy. A5-17
- In addition to requiring tree removal permits and mandating tree replacement standards, the Town's Tree Protection Ordinance in Chapter 12.24 of the Town Municipal Code also requires a tree protection plan to ensure the continued health and viability of trees to be retained within a project's active work zone. The DEIR's impact analysis in impact 3.1-2 and impact 3.3-5 should be revised to address the project's consistency with the entirety of the Town's Tree Protection Ordinance, including the tree protection plan provision. Given the proposed project's extensive work within Frederick Allen Park, it seems highly likely that Park trees not slated for outright removal may still be impacted and A5-18

thus require special attention to ensure their continued health (e.g., fencing to demarcate and exclusion of work from within arborist-recommended non-intrusion zones). Given that the proposed project does not entail such a tree protection plan for trees within Frederick Allen Park that will be retained, the Town believes there is a conflict and potential impact requiring a mitigation measure to ensure the protection of such trees consistent with the tree protection plan provisions of the Town's Tree Protection Ordinance. Because of this potential impact to scenic resources, mitigation measures shall be added requiring, at a minimum, arborist's report and tree protection information, including non-intrusion zones, consistent with Ross Municipal Code section 12.24.100 A5-18 cont.

- Page 3.1-20 discusses the project objective of improvement to natural creek processes under the Town of Ross General Plan. This should also address the General Plan goals and policies related to landscape design. A5-19
- There is only one key observation point (KOP) listed on page 3.1-21 that is within Frederick Allen Park. The EIR states that the visual simulations prepared for that KOP show mitigation of the significant impact to aesthetics after 10 years. The analysis should include other KOPs within the Park including specifically a KOP taken from the fish ladder location facing downstream. If a statement of overriding considerations is adopted for the project, it should consider whether all aesthetics impacts will be mitigated for after 10 years or if the aesthetics impacts will not be mitigated for 20 or 30 years (or longer) at some KOPs. A5-20
- On page 3.1-24 under Operations and Maintenance, Unit 3 Frederick Allen Park, there shall be some mention of the District's maintenance responsibilities of the park trees during the 10 to 20year propagation period and how that would be included in any associated MOU with the Town of Ross. A5-21
- On page 3.1-26, the discussion includes a statement that with mitigation, after approximately 10 years, impacts to visual character and quality would become less than significant and that after 20 years, there would be a benefit to visual character and quality. However, the footnote on the page prior states that the scale and scope of tree planting is subject to United States Army Corps of Engineers (USACE) authorization. It should be clearly indicated that the significant and unavoidable impacts to aesthetics and visual resources could be limited in term as stated but could also be permanent if USACE authorization does not allow for adequate planting of replacement trees. A5-22
- On Page 3.1-28 under Mitigation Measure 3.1-3: Large Tree Planting, Town staff shall provide the final desired specificity to the large box tree planting requirement including exact size of large box trees and species. Further, the final tree and landscape planting plan be provided to the Town for review and approval at least 90 days prior to landscaping. A5-23

3.6 GEOLOGY AND SOILS:

- On page 3.6-23 under the section Operation and Maintenance, the maintenance MOU or other process for the condition in Frederick Allen park where the natural amenities of the new floodplain park will overlap both District and Town of Ross properties/jurisdictions should be mentioned and described. A5-24

3.7 GREENHOUSE GAS EMISSIONS:

- The discussion of the recommended actions from the Town's Climate Action Plan on page 3.7-10 should also include the following recommended actions: A5-25
    - Continue to enforce policies and programs that regulate the removal and replacement of significant trees.
    - To the extent possible, require new development to be planned around existing trees.
    - Support the preservation and creation of conservation areas that provide carbon sequestration benefits, such as those with tree cover.

3

3.9 HYDROLOGY AND WATER QUALITY:

- On page 3.9-9 under the section Storm Drainage System, the mechanism by which stormwater runoff collects from drainage areas throughout the watershed and is routed by the municipal storm drain system into the channel will be compromised by the increase in water surface elevation within the proposed project channel. This is an impact that requires mitigation and shall be addressed. A5-26
- On page 3.9-16 under Floodway and Tsunami Inundation Zones, it shall be mentioned that a FEMA CLOMR will be required wherever the proposed project causes an increase in the 100-year base flood elevation within the regulatory floodway. A5-27
- On page 3.9-60 under "Summary of Project Benefits" there is no metric assigned to how a parcel would receive a benefit from flood reduction. The County shall perform detailed property elevation surveys to provide a clearer understanding of any material flood risk reduction potential to structures as well as the specific impacts to properties along the creek. A5-28

3.11 PUBLIC SERVICES:

- Impact 3.11-2 should be identified as Potentially Significant for operation and maintenance and the mitigation should be that the District will enter into a maintenance agreement with the Town of Ross to maintain all vegetation, stream channel, fencing, walls, and pathways and to correct erosion or flooding issues. A5-29

3.12 RECREATION

- Page 3.12-15 under the section Unit 3 Frederick Allen Park second paragraph includes the phrase, "Because of the very infrequent and short duration of temporary park closures due to flooding". What level of storm event would lead to closure of the multi-use pathway and how frequently has that level of storm occurred in the last 10 years and 20 years? A5-30

3.15 UTILITIES AND SERVICE SYSTEMS:

- On page 3.15-12 under the section Wastewater Treatment and Storm Water Drainage Facilities, the re-routing or reconfiguration of the Ross municipal storm drain system into the new channel shall be addressed. A5-31

5 ALTERNATIVES:

- In General, the long-term impacts on GHG emissions for each of the alternatives shall be discussed. A5-32
- Page 5-25 under Greenhouse Gas Emissions for Alternative 1 it states that the number of trucks trips is only "slightly lower" than the proposed project. This statement is not consistent with the fact that the Frederick Allen Park component of the proposed project contributes 2002 one-way truck trips or 43% of the total truck trips for all project elements. The statement should be revised or supported by additional explanation. A5-33

MITIGATION MONITIORING AND REPORTING PROGRAM:

- Mitigation Measure 3.1-3 Large Tree Planting should include "After construction" for implementation Timing and should explicitly state that the District is responsible for maintaining replacement trees until they become established and for replacing dead trees for a period of no less than ten years. A5-34

OTHER:

- Because the project applicant/proponent specifically states "fiscally responsible" as one of the project objectives, project cost estimates shall be prepared for the proposed Project and the Alternatives for the portion of the work in Ross and entire project length. Further, an evaluation of the cost-benefit A5-35

4

analysis, similar to that provided by the USACE, should be provided to compare Alternative 1 with the proposed project. A5-35 cont.

Thank you in advance for considering the Town of Ross' comments and incorporating them into the Corte Madera Creek Flood Risk Management Project Phase 1 Final EIR.

Sincerely,

Joe Chinn
Town Manager

cc: Mayor Julie McMillan and Council Members

5

2.3.5 Response to Comment Letter A5: Town of Ross

A5-1 The commenter states that there are inconsistencies with the mitigation measure labels in the Executive Summary and the Mitigation Monitoring and Reporting Program

Page ES-9, Section ES.3.1 has been revised as follows to correct the mitigation measure label.

> The District would implement Mitigation Measure ~~3.1-2~~ 3.1-3: Large Tree Planting, which requires integrating large box trees into the planting plan and design for Frederick Allen Park.

A5-2 The commenter states that the description of the alternatives in the Executive Summary should include a statement on the long-term impacts on GHG emissions for each alternative.

Page ES-11, Section ES.5, Summary of Alternatives to the project, has been revised as follows to include a statement related to long-term GHG emissions under each alternative.

> Compared to the proposed project, Alternative 1 would reduce short-term impacts on aesthetics, air quality, biological resources, geology and soils, GHG emission, hazardous materials, hydrology and water quality, noise, recreation, transportation and circulation, and utilities. Alternative 1 would avoid the significant and unavoidable impact on visual quality. Alternative 1 would result in less long-term benefits to aesthetics, biological resources, geology and soils, hydrology and water quality, and recreation than the proposed project and would provide less long-term GHG emission reduction benefits compared to the proposed project because Alternative 1 would involve less planting and natural stream processes that provide long-term GHG reductions through carbon sequestration. Alternative 1 would meet all feasibility criteria and would meet most project objectives.
>
> Compared to the proposed project, Alternative 2 would result in reduced operational impacts and increased long-term benefits on biological resources, hydrology and water quality, hazards, recreation, and transportation and circulation. Compared to the proposed project, Alternative 2 would result in a minor long-term net benefit for GHG emissions. Alternative 2 would meet all feasibility criteria and all project objectives.
>
> Compared to the proposed project, Alternative 3 would result in a slight reduction in long-term aesthetic, biological, and hydrology and water quality impacts than the proposed project. However, this alternative could result in slightly increased temporary air quality, GHG emissions, and energy impacts during construction due to increased import of materials. Alternative 3 would result in similar long-term GHG emission impacts as the proposed project.

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Page ES-28, Table ES-1 Summary of Impacts and Mitigation for the project, has been revised as follows to correct the mitigation measure label.

Impact	Level of Significance Before Mitigation	Mitigation Measures
Impact 3.12-3: The project could affect existing recreational opportunities.	Potentially Significant	**Mitigation Measure ~~3.1-2~~ 3.1-3: Large Tree Planting (see Aesthetics and Visual Resources above)** **Mitigation Measure 3.12-3: Temporary Shade Structures.** The District shall coordinate with the Town of Ross to select the type and location for installation of temporary shade structures in Frederick Allen Park. The temporary shade structures shall be located along the edge of the Bike Route 20 multi-use path and at seating areas as needed to provide shade during the vegetation establishment period. The temporary shade structures shall be removed when the tree canopy has sufficiently established to provide afternoon shade of the pathway and as determined through coordination with the Town of Ross. The District will submit a draft plan for the shade structures to the Town of Ross no less than 60 days prior to construction. **Mitigation Measure 3.14-1: Traffic Management (see Transportation and Circulation below)**

Page G-15 of Appendix G Mitigation Monitoring and Reporting Program, Table G-1 Mitigation Measures, has been revised as follows to correct the mitigation measure label.

Significant Environmental Impact	Mitigation Measure	Application Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
Impact 3.12-3: The project could affect existing recreational opportunities.	**Mitigation Measure ~~3.1-2~~ 3.1-3: Large Tree Planting (see Aesthetics and Visual Resources above)**	• See above	• See above	• The District • Contractor	• Prior to construction • During construction		

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A5-3 The commenter states that the significant and unavoidable impact to visual quality for 10 years until trees establish does not appear to be supported by the visual simulations, which show tree growth to pre-project conditions after 20 years.

Section 3.1-3, Impact Analysis, states that after 10 years, impacts on visual quality in Frederick Allen Park would be less than significant. The rationale for the impact becoming less than significant after 10 years of tree growth is provided on page 3.1-26 of the Draft EIR. Additional information on the growth rates of trees that are proposed in the Draft EIR landscape plan was presented at the Town of Ross meeting on May 13, 2021. The Town of Ross projected the following growth rates for trees that are proposed in Frederick Allen Park. As presented at the public meeting, many of the trees that are proposed in Frederick Allen Park would reach a height of 30 feet or more within 10 years based on their growth rates.

Plant Species	Growth Rate	Maturity (ft.)	Container Size
Acer macrophyllum, Big leaf maple	36"/yr.	Height: 30-70 Spread: 30-50	15 gal. 7-8 x 2-3 ft.
Acer negundo, Box elder	36"/yr.	Height: 40-50 Spread: 35-40	15 gal. 7-8 x 2-3 ft.
Alnus rhombifolia, White Alder	36"/yr.	Height: 50-90 Spread: 40-70	15 gal. 7-8 x 2-3 ft.
Cornus nuttalli, Western dogwood	24"/yr.	Height: 40-50 Spread: 20-25	5 gal. 1-2 ft.
Physocarpus capitatus, Pacific ninebark	24"/yr.	Shrub to 8 ft.	5 gal. 1-2 ft.
Quercus agrifolia, Coast live oak	12-24"/yr.	Height: 20-70 Spread: 20-70	36" box 12-14 x 5-6 ft.
Quercus lobata, Valley oak	24-36"/yr.	Height: 50-70 Spread: 50	24" box 8-10 x 2-4 ft.
Salix lasianra, Pacific willow	36"/yr.	Height: 10-40 Spread: 10-25	1 gal. 12" or less
Salix lasiolepis, Arroyo willow	36"/yr.	Height: 10-35 Spread: 10-25	1 gal. 12" or less
Salix sitehensis, Sitka willow	36"/yr.	Height: 23	1 gal. 12" or less
Umbelluraria californica, Bay laurel	12-24"/yr.	Height: 60-80 Spread: 30-40	15 gal. 3-2 ft. 24" box 4-5 x 3-4 ft.

Source: (Town of Ross, 2021)

A5-4 The commenter states that Section ES.8.1 should mention the increase in water surface elevation within the new riparian channel and resultant backwater flow out to the municipal storm drain system of pipes and channels.

The project modeling shows an increased water surface elevation within Corte Madera Creek because the proposed project would keep more water within the Corte Madera Creek channel. If the increase in the creek water surface elevation could cause backwater flow out of the storm drain inlets, backflow preventers would be installed either at the creek outfall or at the storm drain inlets. Backflow preventers will be incorporated into the final design, where appropriate. The design process is discussed in Master Response 3, and additional details, such as backflow preventers will be included in the subsequent design.

A5-5 The commenter states that the term "large tree planting" should be defined including the beginning height of 24-inch and 36-inch box trees.

The text of Mitigation Measure 3.1-3 is revised as follows:

> **Mitigation Measure 3.1-3: Large Tree Planting**. The District will integrate ~~large box trees~~ 24-inch or 36-inch box trees into the final planting plan and design for Frederick Allen Park, to the extent ecologically appropriate for the proposed species. The Town of Ross will provide the desired size and species of trees to the District. The final planting plan will be provided to the Town of Ross for review and approval ~~comment~~ no less than 90 days prior to landscaping. The District will be responsible for maintaining replacement trees until they become established and for replacing dead trees for a period of no less than 10 years.

The text on page 2-37 of the Draft EIR has been revised as follows to include two table notes to define the approximately height of the 24-inch box and 36-inch box trees.

Common Name	Species Name	Size
Frederick Allen Park		
Coast live oak	*Quercus agrifolia*	36-inch box[a]
Valley oak	*Quercus lobata*	24-inch box[a]

[a] A 36-inch-box tree would be approximately 10 to 15 feet high, and a 24-inch-box tree would be approximately 8 to 12 feet high.

~~[a]~~[b] The sizes indicated are minimum size requirements. Treepot 4 is a 4-inch square by 14-inch-deep pot.

A5-6 The commenter states the EIR should be revised to acknowledge that the project will also require the Town of Ross to approve discretionary Design Review, Building, Grading, and Encroachment Permits.

Page 1-5 of the Draft EIR has been revised as follows to include Town of Ross approval of a discretionary Design Review permit. The building and grading permits are non-discretionary. The District would require an easement for long-term management of the proposed project/habitats and an encroachment permit is not anticipated to be necessary.

1.4.4 Town of Ross

The Town of Ross owns Frederick Allen Park. The District will need to obtain Town of Ross approval of an easement for construction and maintenance of project elements on Town property. The District would enter into a maintenance agreement with the Town regarding maintenance of project elements within Frederick Allen Park. The Town is a responsible agency under CEQA in the review of project elements within Town jurisdiction. The proposed project would require the Town's Design Review approval and an easement for construction and long-term management of the constructed habitats. In addition, a Town of Ross tree removal permit ~~is~~ would be required prior to removing trees within the Town of Ross.

A5-7 The commenter states that in Figure 2.3-2 and Figure 3.9-2, the Water Year axis should continue through 2019.

Figures 2.3-2 and 3.9-2 in the Draft EIR were provided to illustrate the history of flooding in Ross Valley. The extension of the water year axis is not necessary to demonstrate that there is a history of flooding in Ross Valley.

A5-8 The commenter states Figure 2.5-4 should clearly show the existing concrete channel walls on both sides of the channel for ease of reference.

Figure 2.5-4 shows the proposed landscape plan. Due to the relocation of the channel and the number of trees that are proposed, the existing concrete channel would obscure the graphic. An additional graphic of the area was prepared for a Town of Ross public workshop in April 2021 and markings were placed throughout the park to assist the public in understanding where the natural channel and proposed project elements would be located. This graphic is provided on the following page.

A5-9 The commenter states that the concrete apron at the transition between Unit 3 and Unit 4 should be mentioned and described under Section 2.6.4, Grading.

Section 2.6.4, Grading, on page 2-34 has been revised as follows to describe the concrete apron at the transition between Unit 3 and Unit 4.

2.6.4 Grading

Project construction would require grading within the Corte Madera Creek channel and Frederick Allen Park. Areas of channel lowering (Unit 4) and concrete channel removal would be excavated (cut). In addition to earthen fill in

some locations, rock placement would be needed for channel stability and to protect utilities. A concrete apron or half-ton rock would be installed where the fish ladder would be removed in Unit 4, to stabilize sediment and soils. Concrete would be used for the short floodwalls, for retaining walls, and to seal the excavated fish pools. Excavation and fill quantities for each project element are identified in Table 2.6-3.

A5-10 The commenter states that a maintenance memorandum of understanding (MOU) for the project components in Frederick Allen Park that overlap both District and Town of Ross properties should be described in Section 2.7.2 Maintenance.

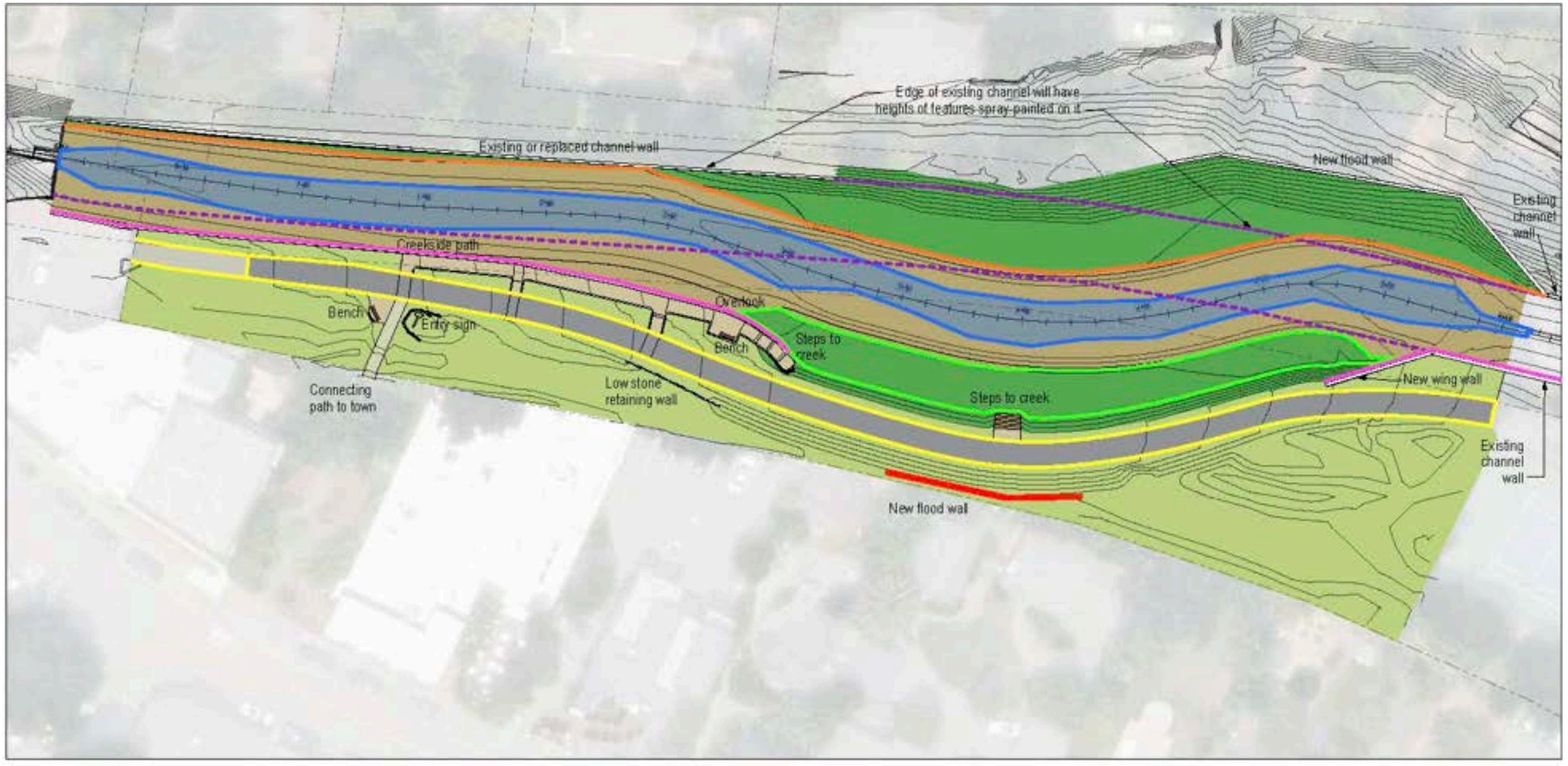
Section 2.7.2 of the Draft EIR (page 2-42) has been revised as follows to include a discussion of the maintenance agreement between the Town of Ross and the District for project elements in Frederick Allen Park.

2.7.2 Maintenance

Once constructed, the project would require ongoing maintenance activities. Maintenance would be similar to existing District maintenance on Corte Madera Creek; however, the newly constructed habitat would require additional landscape maintenance and vegetation management during the establishment period. Maintenance activities would include the following:

1. Vegetation management
2. Sediment and debris removal
3. Stormwater pump station maintenance
4. Annual floodwall and structure inspection and maintenance

Most maintenance activities would occur during the dry season from April 15 to October 15. The Town of Ross would need to grant an easement to the District for maintenance of project elements on Town property, specifically in Frederick Allen Park. As a part of the easement approval process, the District would enter into a maintenance agreement with the Town of Ross that would specify the District's and Town's responsibilities for maintenance of project elements in Frederick Allen Park.



Park Overview

Parcel boundaries

Features

- Existing multiuse path
- New multiuse path
- Existing walk
- New walk
- Park landscape area
- Creek riparian area
- Creek natural channel
- Creek base flow

Site Walk Legend

- Flood wall
- Channel retaining wall
- Existing channel wall to be removed
- Stream base flow
- Multiuse path
- Right bank floodplain
- Left bank earthen fill

0 40 80 120 feet

SCALE: 1" =40'

NORTH

CORTE MADERA CREEK

THROUGH FREDERICK ALLEN PARK

MARIN COUNTY FLOOD CONTROL

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A5-11 The commenter states that Section 2.7.2, Maintenance should include care and establishment of replacement trees in the floodplain park.

Section 2.7.2 of the Draft EIR (page 2-42) has been revised as follows to include maintenance of replacement trees in Frederick Allen Park as a part of vegetation management activities.

Vegetation Management

Vegetation-management activities are employed to achieve three main goals:

1. Maintain channel flow capacity.
2. Reduce fire fuels.
3. Restore creek habitat by removing invasive nonnative plants and revegetating with native plants.

Vegetation management activities would not include ground-disturbing activities. These activities employ vegetation control methods such as cutting and removing invasive vegetation above the ground by hand or with loppers, hand saws, chainsaws, pole saws, weed eaters, and other hand tools. Removal of nonnative vegetation, tree removal, and thinning employ a mix of tools including chainsaws, loppers, hand saws, pole saws, hedge trimmers, and other hand tools. <u>Vegetation management also would include maintenance of replacement trees planted in Frederick Allen Park, including monitoring the establishment of trees after planting.</u>

A5-12 The commenter states that vegetation management goals should include a fourth goal for revegetation of the park for visual amenity and shade.

The Town of Ross's Design Review process would include review of the landscape plans for visual amenities. Visual amenities and shade are not specific project goals.

A5-13 The commenter states that Table 2.8-1 should include approval from the Town of Ross for Design Review, Grading Permit, Building Permit, and Encroachment Permit.

Page 2-44 (Table 2.8-1) of the Draft EIR has been revised as follows to include Town of Ross approval of discretionary Design Review. The building and grading permits would be non-discretionary. The Town of Ross anticipates that a long-term easement would be required for maintenance, in addition to construction, and an encroachment permit would not be required.

Town of Ross	Tree permit Easement <u>and MOU</u> for construction and maintenance within Frederick Allen Park (Town of Ross property) <u>Design review</u>

A5-14 The commenter states that for portions of the project within Ross, visual quality should be evaluated as it relates to the Town of Ross design review criteria and standards, Section 18.41.100 of the Town of Ross Municipal Code.

Section 3.1.3 of the Draft EIR (page 3.1-2) has been revised as follows to describe how the Town of Ross's Design Review criteria and standards would be addressed through the Design Review process. In addition, the analysis under Impact 3.1-2 on page 3.1-2 has been revised (see response to comment A5-16) to analyze compliance with the Town of Ross's design review criteria and standards.

3.1.3 Aesthetic and Visual Concepts

Baseline aesthetic conditions are defined within the context of visual quality and visual sensitivity. For the purpose of this EIR, visual quality and visual sensitivity were defined consistent with the Federal Highway Administration (FHWA) Guidelines for the Visual Impact Assessment of Highway Projects (U.S. Department of Transportation Federal Highway Administration, 2015) the project is not a highway project, the FHWA guidance was used to evaluate overall baseline visual quality in the project area because Marin County has not developed their own guidance for evaluating visual quality and the FHWA guidance was developed to address visual impacts in urban environments, similar to the visual environment of the proposed project. The Town of Ross's design review criteria and standards (Section 18.41.100 of the Town of Ross Municipal Code) would be addressed during the Town of Ross design review process.

A5-15 The commenter states that Figure 3.1-5 is the same photo as Figure 3.1-4 and does not match the description.

Figure 3.1-5 in the Draft EIR has been updated with the correct photo as follows.

Figure 3.1-5 Photograph 8: View of Upper Unit 3 Fish Pools from Kentfield Hospital Bridge, Looking Southeast

A5-16 The commenter states that Section 3.1 should include a discussion of the Town's Design Review Ordinance in the regulatory setting and the impact analysis.

Page 3.1-15 has been revised in the Draft EIR as follows to include a discussion of the Town of Ross's Design Review Ordinance.

Chapter 18.41, Design Review

Purpose (b): This chapter is intended to guide new development, to preserve and enhance these special qualities of Ross, and to sustain the beauty of the town's environment.

Section 18.41.100 Design Review Criteria and Standards.

(a) Preservation of Natural Areas and Existing Site Conditions.

(1) The existing landscape should be preserved in its natural state by keeping the removal of trees, vegetation, rocks, and soil to a minimum. Development should minimize the amount of native vegetation clearing, grading, cutting, and filling, and maximize the retention and preservation of natural elevations, ridgelands and natural features, including lands too steep for development, geologically unstable areas, wooded canyons, areas containing significant native flora and fauna, rock outcroppings, view sites, watersheds and watercourses, considering zones of defensible space appropriate to prevent the spread of fire.

(2) Sites should be kept in harmony with the general appearance of neighboring landscape. All disturbed areas should be finished to a natural-appearing configuration and planted or seeded to prevent erosion.

(d) Materials and Colors.

(2) Natural materials such as wood and stone are preferred, and manufactured materials such as concrete, stucco or metal should be used in moderation to avoid visual conflicts with the natural setting of the structure.

(3) Soft and muted colors in the earth-tone and wood-tone range are preferred and generally should predominate.

(g) Fences and Screening.

Fences and walls should be designed and located to be architecturally compatible with the design of the building. They should be aesthetically attractive and not create a "walled-in" feeling or a harsh, solid expanse when viewed from adjacent vantage points. Front yard fences and walls should be set back sufficient distance from the property line to allow for installation of a landscape buffer to soften the visual appearance. Transparent front yard fences and gates over four feet tall may be permitted if the design and landscaping is compatible and consistent with the design, height and character of fences and landscaping in the neighborhood. Front yard vehicular gates should be transparent to let light and lines of sight through the gate. Solid walls and fences over four feet in height are generally discouraged on property lines adjacent to a right-of-way but may be

permitted for properties adjacent to Poplar Avenue and Sir Francis Drake Boulevard based on the quality of the design, materials, and landscaping proposed. Driveway gates should be automatic to encourage use of onsite parking. Pedestrian gates are encouraged for safety, egress, and to encourage multi-modal transportation and pedestrian-friendly neighborhood character.

(h) Views.

Views of the hills and ridgelines from public streets and parks should be preserved where possible through appropriate siting of improvements and through selection of an appropriate building design including height, architectural style, roof pitch and number of stories.

(i) Natural Environment.

(1) The high-quality and fragile natural environment should be preserved and maintained through protecting scenic resources (ridgelands, hillsides, trees and tree groves), vegetation and wildlife habitat, creeks, drainageways threatened and endangered species habitat, open space and areas necessary to protect community health and safety.

(j) Landscaping.

(1) Attractive, fire-resistant, native species are preferred. Landscaping should be integrated into the architectural scheme to accent and enhance the appearance of the development. Trees on the site, along public or private streets and within twenty feet of common property lines, should be protected and preserved in site planning. Replacement trees should be provided for trees removed or affected by development. Native trees should be replaced with the same or similar species. Landscaping should include planting of additional street trees as necessary.

(2) Landscaping should include appropriate plantings to soften or screen the appearance of structures as seen from off-site locations and to screen architectural and mechanical elements such as foundations, retaining walls, condensers and transformers.

(3) Landscape plans should include appropriate plantings to repair, reseed and/or replant disturbed areas to prevent erosion.

(4) Landscape plans should create and maintain defensible spaces around buildings and structures as appropriate to prevent the spread of wildfire.

(5) Wherever possible, residential development should be designed to preserve, protect and restore native site vegetation and habitat. In addition, where possible and appropriate, invasive vegetation should be removed.

Page 3.1-21 (Impact 3.1-2) has been revised in the Draft EIR as follows to include a discussion of the proposed project's consistency with the Design Review criteria and standards.

> Section 18.41.100 of the Municipal Code provides guidelines for development in the Town of Ross. The Town of Ross would be responsible for verifying that the proposed project complies with the Town's Design Review guidelines through the Design Review process. The following analysis is presented for informational purposes only and does not replace the Town of Ross's independent Design Review.
>
> The proposed project would involve removal of trees and vegetation to construct a new riparian floodplain and natural creek channel. As discussed previously, the proposed project would adhere to mitigation ratios and tree replacement standards in the Town of Ross's Municipal Code and would involve planting riparian vegetation, to enhance habitat along the creek. Disturbed areas would be revegetated and planted with new trees, to maintain and enhance the landscape habitat along the creek. The proposed project also would remove the concrete walls within the creek channel and replace the concrete channel with a natural creek channel, which would be consistent with Section 18.41.100(a) of the Municipal Code. Therefore, the proposed project would comply with Design Review criteria and standards (a), Preservation of Natural Areas and Existing Site Conditions, and no impact would occur.
>
> The concrete retaining wall in Frederick Allen Park would not extend above the ground surface and would be shorter than the existing concrete channel wall. Project landscaping and vegetation would minimize the visual contrast of the retaining wall with the surrounding area. The retaining wall would not conflict with the surrounding natural setting. The new floodwall in Frederick Allen Park would be 2 feet high and also would be screened by landscaping and native vegetation. Because native vegetation would be visible along the expanse of the floodwall, the floodwall would not conflict with the surrounding natural setting. The proposed project would result in a substantial net reduction in concrete in Frederick Allen Park and increase in use of natural materials, compared to existing conditions, and would comply with design review criteria and standards (d) Materials and Colors.
>
> The proposed project would include a split-rail fence in Frederick Allen Park, which would be installed along the top of the channel to prevent encroachment into habitat areas during the vegetation establishment period. The split-rail fence could be removed after the habitat is established. The split-rail fence would not create a solid expanse and would allow light and lines of site through the spaces in the fence. The fence would not conflict with design review criteria and standards (g) Fences and Screening, and no impact would occur.

As described under Impact 3.1-1, the proposed project would not impact scenic vistas or views, including views of hillsides and ridgelines. The proposed project would not conflict with Design Review criteria and standards (h) Views because the project elements would be low-lying and would not block any views of scenic vistas or ridgelines. Thus, no impact would occur.

The proposed project would not impact ridgelands, hillsides, or tree groves. The proposed project would replace the trees removed in Frederick Allen Park, in accordance with the Town of Ross's Municipal Code. The proposed project would include habitat enhancing elements, including riparian vegetation planting in Unit 4 and Upper Unit 3, and concrete channel removal in Upper Unit 3 and lower Unit 2. The proposed project would result in more natural creek conditions and enhanced habitat and would comply with the natural environment guideline (Section 18.41.100[i] of the Municipal Code). Therefore, the proposed project would not conflict with Design Review criteria and standards (i) Natural Environment. No impact would occur.

As discussed above, the proposed project would involve riparian vegetation planting, and trees proposed for removal would be replaced, per the Town of Ross's Municipal Code. Graded areas in Frederick Allen Park would be revegetated to prevent erosion. After being constructed, the proposed project would require ongoing vegetation management as a part of maintenance activities, which would include removal of invasive nonnative plans and revegetation with native plans. The proposed project would comply with design review criteria and standards (j) Landscaping. No impact would occur.

The proposed project would comply with all applicable Town of Ross design review criteria and standards and there would be no significant impact.

A5-17 The commenter states that Section 3.1 should include a discussion of Ross General Plan Policy 3.2, Landscape Design in the regulatory setting and in the impact analysis.

Page 3.1-15 has been revised in the Draft EIR as follows to include a discussion of the Town of Ross General Plan Policy 3.2.

3.2. Landscape Design. Where appropriate, encourage landscape designs that incorporate existing native vegetation, enhance the cohesiveness of the Town's lush, organic landscape, and integrate new planting with existing site features.

Page 3.1-21 (Impact 3.1-2) has been revised in the Draft EIR to include a discussion of the proposed project's consistency with this General Plan policy.

As discussed above under Goal 1, the proposed project would involve native riparian vegetation planting within Unit 4 and Upper Unit 3 (Frederick Allen Park), which would improve the existing riparian habitat adjacent to the creek. The proposed project would involve native tree planting in the park, including

willows along the channel. The proposed project would be consistent with Policy 3.2 because landscaping would include planting native vegetation that would enhance the existing environment and have a beneficial impact on riparian habitat.

A5-18 The commenter states that Section 3.1 should include a discussion of the tree protection plan, as required under Chapter 12.24 of the Town Municipal Code. The comment also states that impact 3.1-2 and impact 3.3-5 should be revised to address the project's consistency with the Town of Ross tree protection plan provision.

Page 3.1-15 has been revised in the Draft EIR as follows to include a discussion of the Town of Ross's Tree Protection Plan, as required under Chapter 12.24 of the Town of Ross's Municipal Code.

Section 12.24.100. Tree Protection Plan. To protect trees during construction of a project and thereafter, and to maximize the chances of their subsequent survival, a Tree Protection Plan shall be required on sites where Significant or Protected trees may be affected. The Tree Protection Plan shall include a certified arborist's report on existing conditions as well as a plan for tree protection during project construction.

(1) When a Tree Protection Plan is Required. A tree protection plan shall be required as part of the materials submitted with applications for Hillside Lot Permits and Hazard Zone Use Permits.

A Tree Protection Plan may be required for Subdivision Permits, Variances, Demolition Permits, Design Review, or Grading and/or Building Permit reviews at the discretion of the Public Works Director or Town Council, as applicable.

Page 3.1-21 (Impact 3.1-2) has been revised in the Draft EIR as follows to include a discussion of the Tree Protection Plan and the proposed project's consistency with Section 12.24.100 of the Town of Ross's Municipal Code.

Town of Ross Municipal Code

Chapter 12.24 of the Municipal Code provides ratios for replacing trees that have been removed and requirements for a Tree Protection Plan. The project would adhere to the mitigation ratios and tree replacement standards in the Town of Ross Municipal Code, and the District would obtain a tree removal permit from the Town of Ross to ensure there would be no conflict. The District would prepare a Tree Protection Plan as part of the Design Review process. The Tree Protection Plan would include a certified arborist's report on the existing trees in the project area that could be affected by project construction and a plan for protecting existing trees during construction. Because the District would provide tree planting and replacement at the ratio required by the Town of Ross, ~~and~~ obtain a Tree Removal Permit from the Town of Ross, and prepare a Tree

Protection Plan, the impact from conflict with Town of Ross Municipal Code would be less than significant.

Page 3.3-88 (Impact 3.3-5) has been revised in the Draft EIR as follows to include a discussion of the Tree Protection Plan and the proposed project's consistency with Section 12.24.100 of the Town of Ross's Municipal Code.

The District would be required to obtain a tree removal permit from the Town of Ross and provide replacement trees as specified in the Town of Ross Municipal Code. The District would also be required to prepare a Tree Protection Plan as part of the Design Review process. The Tree Protection Plan would include a certified arborist's report on the existing trees in the project area that could be affected by project construction and a plan for protecting existing trees during construction. Because the District would obtain a tree removal permit and prepare a Tree Protection Plan in compliance ~~and comply~~ with the Town of Ross tree protection ordinance, the impact from conflict with Town of Ross ordinance for the protection of biological resources would be less than significant.

A5-19 The commenter states that page 3.1-20 should address the Town of Ross General Plan goals and policies related to landscape design.

Refer to response to comment A5-17 for a discussion of project consistency with Policy 3.2, Landscape Design of the Town of Ross's General Plan.

A5-20 The commenter states that the analysis should include additional Key Observation Points (KOPs) within Frederick Allen Park.

The District prepared simulations for two additional locations in the Frederick Allen Park reach—one on the left bank of the creek near the Denil fish ladder facing upstream toward Unit 4, and one on the right bank of the creek near the Denil fish ladder facing downstream. A second simulation was provided for each KOP that did not include foreground trees and vegetation, which would block the view of project components. The foreground vegetation was removed from these simulations so that the reader can see the locations of the project components relative to the KOP locations. These simulations are provided below.

As described in the Draft EIR, KOPs were selected from areas where the proposed project's components would be visible to the public, to evaluate project changes on visual quality. The KOPs included in the Draft EIR provide representative views of the proposed project, and the simulations provide representative visual impacts. As shown in the additional KOP visual simulations below, 10 to 20 years after project construction, the tree canopy and native vegetation would mature and provide cover and visual screening of project components and from the surrounding residential and commercial areas.

Additional KOP: Simulation of Frederick Allen Park at Denil Fish Ladder (left bank), 20 Years after Project Construction

Additional KOP: Simulation of Frederick Allen Park at Denil Fish Ladder (left bank), 20 Years after Project Construction (foreground trees removed to provide views of project components)

Additional KOP: Simulation of Frederick Allen Park at Denil Fish Ladder (right bank), 20 Years after Project Construction

Additional KOP: Simulation of Frederick Allen Park at Denil Fish Ladder (right bank), 20 Years after Project Construction (foreground trees removed to provide views of project components)

Visual impacts in Frederick Allen Park would be minimized to a less than significant level 10 years after project construction. The additional KOPs and associated simulations would not change the conclusions made in the Draft EIR.

A5-21 The commenter states that the analysis on page 3.1-24 should mention the District's maintenance responsibilities for the newly planted trees in Frederick Allen Park and should discuss the maintenance MOU between the District and the Town of Ross.

Page 3.1-26 of the Draft EIR has been revised as follows to include a discussion of the MOU between the District and the Town of Ross regarding maintenance of project elements on Town property, including newly planted trees in Frederick Allen Park.

> After a period of approximately 10 years, a new tree canopy would become established, and the visual character of the park would be similar to the existing conditions where trees shade the pathway and screen views of the surrounding buildings and structures as shown in Figure 3.1-13. After 20 years, the trees would mature and an extensive tree canopy would cover the park, as shown in Figure 3.1-14. The improvements to the park, including tree planting, additional seating, educational signage, and access to the creek would provide views of a natural creek corridor and would provide greater wildlife viewing opportunities due to the wildlife that would be attracted to the area. Under the District's MOU with the Town of Ross for maintenance in Frederick Allen Park, the District would be responsible for maintenance of replacement trees planted in the park, including monitoring establishment of trees after planting. This would ensure that the tree planting is successful, and that the tree canopy is established in the park.

A5-22 The commenter states that Section 3.1 should indicate that significant and unavoidable impacts to aesthetics could be permanent if USACE does not allow for adequate planting of replacement trees.

The analysis reflects the worst-case scenario for tree removal, in which USACE would require a 15-foot vegetation free area from the new floodwalls and removal of 144 trees in Frederick Allen Park. The USACE does not consider the retaining walls at the connection to the existing concrete channel to be a floodwall and will not enforce tree or vegetation setbacks from the retaining walls. USACE would only consider applying a vegetation setback to the 2-foot-tall floodwall, if the USACE determines the 2-foot-tall wall is a floodwall. The visual simulations in the Draft EIR reflect the maximum extent of tree removal that could be required. Under the maximum tree removal scenario, as indicated in the analysis, the District would plant trees as shown in the Landscape Plan and in accordance with the Town of Ross's Municipal Code. The new tree planting would be sufficient to screen views of the surrounding structures after the first 10 years. The impact would be less than significant after the 10-year establishment period. This conclusion was also supported by the tree growth rates that were defined by the Town

of Ross' independent landscape architect and presented at the public meeting on May 13, 2021.

A5-23 The commenter states Mitigation Measure 3.1-3: Large Tree Planting should indicate that the Town of Ross will provide the exact size and species for the trees and the landscape plan would be submitted at least 90 days prior to landscaping.

Mitigation Measure 3.1-3: Large Tree Planting (on page 3.1-28) has been revised as indicated in response to comment A5-5.

A5-24 The commenter states that the MOU between the District and the Town of Ross should be mentioned in Section 3.6.

The text on page 3.6-23 of the Draft EIR has been revised as follows in reference to the maintenance MOU between the District and the Town of Ross.

> **Operation and Maintenance**
>
> The proposed project would ~~will~~ require removal of trees and vegetation within Frederick Allen Park and within Unit 2 to create natural habitat. The area of tree removal would be replaced with native vegetation including shrubs, grasses, and riparian trees. Revegetation would provide long-term stabilization to avoid substantial soil loss. The area of grading and excavation at the stormwater pump station and the floodwalls would be permanently stabilized by the project elements that would be installed in the area, including gravel and concrete. Long-term maintenance activities in Frederick Allen Park would be the responsibility of the District, as specified in the maintenance MOU between the Town of Ross and the District.

A5-25 The commenter states that the discussion of the recommended actions from the Town's Climate Action Plan in Section 3.7 is missing a few recommended actions.

The text on page 3.7-11 of the Draft EIR has been revised as follows to include the additional recommended actions in the Town of Ross's Climate Action Plan.

- Adopt and implement a policy requiring limitations on idling for commercial vehicles, construction vehicles, buses and other similar vehicles, beyond state law, where feasible.
- Continue to enforce policies and programs that regulate the removal and replacement of significant trees.
- To the extent possible, require new development to be planned around existing trees.
- Support the preservation and creation of conservation areas that provide carbon sequestration benefits, such as those with tree cover.

A5-26 The commenter states that Section 3.9 requires further discussion and mitigation to address the increase in water surface elevation within the channel resulting from stormwater runoff routed through the municipal storm drain system into the channel.

Refer to response to comment A5-4. While the increase in water surface elevation would reduce the storm drain system flow capacity to Corte Madera Creek at the outfall the effect would be offset by the reduced overtopping of the Corte Madera Creek channel and the associated reduction in flood inundation. No additional mitigation is required because the project would provide a net benefit from the reduction in water surface elevation during flooding and would not cause a significant effect from the installation of backflow preventers.

A5-27 The commenter states that Section 3.9 should mention a FEMA Conditional Letter of Map Revision (CLOMR) would be required wherever the proposed project would cause an increase in the 100-year base flood elevation within the regulatory floodway.

The requirement for a FEMA CLOMR was listed in Table 2.8-1 of the Draft EIR. The text on page 3.9-16 of the Draft EIR has been revised as follows to include a discussion of FEMA CLOMR.

> **Floodway and Tsunami Inundation Zones**
>
> Given that project construction would involves work in or along the creek channel, the project area at least partially would overlaps the regulatory floodway. A small portion of Unit 2, Lower Corte Madera Creek, is in the Tsunami Inundation Area (California Emergency Management Agency, 2009) (see Figure 3.9-3 below). Any locations where the proposed project would cause an increase in the 100-year base flood elevation within the regulatory floodway would require a Conditional Letter of Map Revision from FEMA.

A5-28 The commenter states that the County should perform detailed property elevation surveys to provide a clearer understanding of any material flood risk reduction potential to structures.

The request for detailed property elevation surveys is beyond what is required for CEQA. The modeling that has been conducted as a part of the proposed project serves as the substantial evidence required under CEQA to evaluate adverse impacts of a project. Property surveys are not required to determine that the project would not result in a significant adverse impact. The modeling shows that the areas where water surface elevations would substantially increase (> 0.2 foot) are isolated to the channel and parking areas where no structures are located. Detailed property surveys would not affect the determination that no structures are located in these areas and the project would not result in a significant adverse impact on flooding. Additionally, CEQA does not require the identification of beneficial impacts, only adverse impacts. Beneficial impacts of the project were provided in the EIR as general information for the reader,

and are not part of the required CEQA analysis. Refer also to Master Response 3 regarding the design process.

A5-29 The commenter states that Impact 3.11-2 should be identified as potentially significant for operation and maintenance and the mitigation measure should be the maintenance MOU between the District and the Town of Ross.

The MOU between the District and the Town of Ross for District maintenance of Frederick Allen Park is included as a part of the proposed project, as described on page 1-5 and page 2-42 of the Draft EIR. The MOU would be required as a part of the easement approval for District construction and maintenance of project elements within Town property, which is a legal issue and is not considered to be mitigation. See response to comment A5-13 for modifications to Table 2.8-1 to address the required MOU.

A5-30 The commenter asks what level of storm event would lead to closure of the multi-use pathway and how frequently has that level of storm occurred in the last 10 years and 20 years.

The storm event that would likely result in closure of the path is around the 5-year storm event range since the proposed project pathway would have a lower elevation adjacent to the viewing platform and the floodplain. See Master Response 1 regarding the District staff's recommendation to adopt Alternative 1, which does not include modifications to the pathway.

A5-31 The commenter states that the re-routing or reconfiguration of the Ross municipal storm drain system into the new channel should be addressed in Section 3.15.

It is not anticipated that re-routing or reconfiguration of the Ross municipal storm drain system, except potentially for backflow prevention improvements (refer to response to comment A5-4), would be needed to address the change in Corte Madera Creek water surface elevation. See also Master Response 1 regarding staff recommendation to adopt Alternative 1.

A5-32 The commenter states that the long-term impacts on GHG emissions for each of the alternatives shall be discussed.

Refer to response to comment A5-2 regarding the additional discussion of the comparative GHG emissions and emission reduction benefits of each alternative.

Page 5-16 of the Draft EIR has been revised as follows to include a discussion of the long-term GHG benefits of the proposed project:

> The No Project Alternative would avoid the proposed project's impact on GHG resulting from use of off-road construction equipment and vehicles during project construction and would avoid GHG emissions from operation of the

emergency generator and energy use at the stormwater pump station. The No Project Alternative would have minimal greenhouse gas emissions during maintenance of existing facilities, like the proposed project. However, the No Project Alternative would not involve creation of natural riparian habitat and would not create the greenhouse gas emission reduction benefits of the proposed project.

Page 5-24 in the Draft EIR has been revised as follows to include consideration of the net benefits of the proposed project that would not be achieved by Alternative 1:

Comparison of Impacts to the Proposed Project

Alternative 1 would involve the same type of equipment as that used by the proposed project, but the construction schedule would be shorter under Alternative 1 because no construction would occur in Frederick Allen Park. The number of construction truck trips under this alternative also would be ~~slightly~~ lower than the proposed project because of avoidance of Frederick Allen Park, which would reduce the construction GHG emissions. Operational GHG emissions under Alternative 1 would be ~~the same as~~ greater than the proposed project because Alternative 1 would not remove the concrete channel and would not include as much vegetation in Frederick Allen Park. Temporary GHG emission impacts associated with implementation of Alternative 1 would be less than that of the proposed project, but Alternative 1 would have reduced long-term GHG reduction benefits than the proposed project.

Page 5-37 of the Draft EIR has been revised as follows to address the long-term GHG reduction benefits of the proposed project compared to Alternative 1:

Alternative 1 would have less long-term benefits to aesthetics, biological resources, geology and soils, greenhouse gases, hydrology and water quality, and recreation than the proposed project because Alternative 1 would not include creation of a natural creek channel, floodplain, and riparian habitat in Frederick Allen Park.

Page 5-41 is revised as follows:

Alternative 2 would allow increased planting relative to the proposed project because light and water could penetrate the boardwalk, which would allow planting underneath it. The increased planting would result in long-term GHG reduction benefits.

Page 5-42 of the Draft EIR includes a statement regarding the minor long-term net benefit on GHG emissions that would result from Alternative 2. Page 5-47 of the Draft EIR has been revised as follows to include long-term impacts on GHG emissions for Alternative 3.

Air Quality and Greenhouse Gases

Alternative 3 would involve the use of construction equipment and vehicles that would result in temporary GHG emissions, similar to the proposed project. The amount of equipment and vehicle use, as well as fugitive dust and GHG emissions associated with Alternative 3 could be slightly higher than the proposed project because of the increased project footprint and associated number of truck trips for material import and export in Unit 2. Implementation of Mitigation Measure 3.2-1 would reduce the impacts to a less-than-significant level. The alternative would comply with all applicable BAAQMD rules and regulations and would not result in extended exposure of nearby residences to criteria air pollutants or toxic air contaminants. Operational air quality and GHG emissions impacts would be the similar to the proposed project because maintenance activities are anticipated to be similar and infrequent.

Table 5.4-1 on page 5-54 is revised as follows:

Topic	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)
Greenhouse Gas (GHG) Emissions	LTS ≤ ≥ The reduced construction in Frederick Allen Park would result in reduced GHG emissions during construction, but the alternative would not achieve the long-term GHG reduction emissions.	LTS = ≤ The construction intensity would be similar to the proposed project and would have similar GHG emissions. The alternative would have greater GHG reduction benefits.

A5-33 The commenter states that Section 5-1 states the number of truck trips for Alternative 1 is slightly lower than the proposed project, even though the Frederick Allen Park component contributes 43% of the total truck trips for the proposed project.

Page 5-25 of the Draft EIR has been revised as shown in response to comment A5-32 to clarify the number of truck trips for Alternative 1 compared to the proposed project.

A5-34 The commenter states that Mitigation Measure 3.1-3 in the MMRP should indicate that the District is responsible for maintenance of replacement trees after construction is complete.

Page G-3 of Appendix G, MMRP has been revised to indicate "After construction" in the Implementation Timing Column for Mitigation Measure 3.1-3. Refer to response to comment A5-23 for revisions to Mitigation Measure 3.1-3, which indicate that the District is responsible for maintaining replacement trees.

Implementation Timing
• Prior to construction • During construction • After construction

A5-35 The commenter states that project cost estimated should be prepared for the proposed project and the alternatives for the portion of work in the Town of Ross and for the entire project length.

Refer to Master Response 5 for a response to this comment.

Comment Letter A6

City of Larkspur

400 Magnolia Avenue, Larkspur, California 94939
Telephone: (415) 927-5110 Fax: (415) 927-5022
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Joanna Dixon, Project Manager
Marin County Flood Control
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903

Via email: envplanning@marincounty.org; jdixon@marincounty.org

March 17, 2021

RE: Marin County Flood Control and Water Conservation District
Corte Madera Creek Flood Risk Management Project, Phase 1
Draft Environmental Impact Report

Thank you for the opportunity to provide comment on the above referenced project. The City of Larkspur is a participant in and supporter of the Ross Valley Watershed Flood Risk Reduction Program.

The City supports the development of projects that will reduce flood risks in the watershed, while not creating any additional flood risks in Larkspur. The City looks forward to the District finalizing the detail design and modeling of the proposed improvements such that the EIR's conclusion that the proposed project would not increase flood risk in areas downstream can be fully vetted and confirmed. A6-1

We note the following questions/ comments in review of the Draft EIR:

Pg 27.
While exhibits ES-2 and ES-3 show jurisdictional boundaries between unincorporated Kentfield and the Town of Ross, exhibit ES-4 does not show the boundary between unincorporated Kentfield and the City of Larkspur. It is understood from this exhibit that no improvements are proposed within the City of Larkspur. A6-2

Pg. 35.
Text states:

> 'The project would result in some increased flooding within the parking areas adjacent to Corte Madera Creek near the College Avenue Bridge; however, the areas of increased flooding do not contain any homes or buildings and the increased flooding would not create a risk to life or property.' A6-3

Pg 70.
Five bullet points describe the capacity increasing components of the project. A6-4

Planning: (415) 927-5038 Parks and Recreation: (415) 927-6746 Library: (415) 927-5005
Public Works: (415) 927-5017 Central Marin Police: (415) 927-5150 Fire: (415) 927-5110

Pgs 432-434
The exhibits showing changes in water surface elevation do not extend far south enough to evaluate the impact in the City of Larkspur of altered flood depths given the above noted page 35 and page 70 statements regarding downstream flooding and increased flood capacity within the project footprint. A6-5

Pg 441
Figure 3.9-10 – only the 25-year 'existing conditions' scenario is shown; whereas the previous slides referenced above showed 10, 25 and 100 year 'future conditions.' A6-6

We look forward to working with the District in the delivery of this and other projects to reduce flood risks in the watershed.

Sincerely,

Julian Skinner, PE
City of Larkspur City Engineer/ Public Works Director

Copy To: City Council
Dan Schwarz, City Manager
Neal Toft, Planning and Building Manager

2.3.6 Response to Comment Letter A6: City of Larkspur

A6-1 The commenter states that the City looks forward to the District finalizing the detail design and modeling of the proposed improvements to confirm the EIR's conclusion that the proposed project would not increase flood risk in areas downstream.

Refer to Master Response 3 for detailed modeling of the 60 percent design, including areas downstream in the City of Larkspur.

A6-2 The commenter states that they understand based on ES-4 that no improvements are proposed within the City of Larkspur.

The commenter is correct. No project elements are proposed within the City of Larkspur. Please refer to response to comment A5-8 for updated project elements figures.

A6-3 The commenter quoted text from the Draft EIR.

The commenter's text from the Draft EIR is correct.

A6-4 The commenter quoted five bullet points from the Draft EIR that describe the capacity increasing components of the project.

This text from the Draft EIR is correct.

A6-5 The commenter states that Figure 3.9-7 through 3.9-9 of the Draft EIR do not extend far south enough to evaluate the impact in the City of Larkspur.

The figure extent has been updated to include the City of Larkspur. See the updated figures in Master Response 3.

A6-6 The commenter states that Figure 3.9-10 does not show the 10-, 25-, or 100-year future conditions.

Appendix E, Supplemental Water Surface Elevation Maps of the Draft EIR, includes figures that show the project changes in velocity and model-predicted water surface elevation changes during a 10-year, 25-year, and 100-year flood. Additional figures showing updated 10-, 25-, and 100-year flood water surface elevations for the Alternative 1 60 percent design are provided in Master Response 3.

2.4 Organizations

Comment Letter B1

March 15, 2021

Joanna Dixon
Project Manager
3501 Civic Center, Suite 304
San Rafael CA 94903

Via email: jdixon@marincounty.org

RE: Comments on Corte Madera Creek Flood Risk Management Project, Phase 1 Draft EIR

Dear Ms. Dixon,

Thank you for the opportunity to comment on this important document. Friends of Corte Madera Creek Watershed is eager to see this project implemented. Our comments are divided into two sections. The first includes general comments on the overall document, project or project components. The second presents corrections that should be made.

Comments

Friends appreciates the challenge this important project presents and the need to balance the project's objectives: Flood Risk Reduction, Environmental Benefits, Public Access and Recreation, Operation Reliability, Regulatory Compliance, and Fiscal Responsibility. Friends agrees these are all worthy objectives. The one troublesome detail, however, is while Friends agrees that improving channel stability is worthy, we disagree that the concrete channel itself should be made stronger. In the long run, Friends believes it would be preferable to remove it. B1-1

Section 1.4.4

In describing Ross' participation, the document uses the word "will" instead of "would." This suggests that Ross will definitely be a participant. The verb "would" is more appropriate. B1-2

Section 2 Project Description

Raised Walls

If it is necessary to build raised walls, we have several recommendations:

1. In many cases, walls should be constructed on the outer edge of the District's right-of-way. Instead of concrete, consideration should be given to wooden walls, soldier pile or sheet pile walls, and/or boulders and earth berms presented in Alternative 3. We believe these walls could be installed within the District's right-of-way, removing the objection that walls in such a location would be expensive and cause delays because of the need to obtain construction rights-of-way from adjacent property owners. In Unit 2, downstream of College Avenue, we specifically request that setback walls not be constructed in the middle of the District's right-of-way in this reach because it would compromise future plans for locating the multi-use path MUP (Route 20) on the left bank of the creek (see comment on Cumulative Projects below). B1-3 B1-4

2. An alternative to building walls in Unit 2 downstream of College Avenue could be to raise the level of the future location of the MUP on the left bank of the creek. This would serve two purposes. First, it would provide part or all of the necessary added height for the wall and it would raise the MUP so it could be designed to meet ADA standards for crossing College Avenue and reaching the new Stadium Way Bridge, both of which are 2 to 4 feet above the ground surface. Second, it would provide a disposal location for fill removed from upstream projects. As for local drainage, it will be necessary to deal with such drainage no matter where the raised "wall" or "berm" is located. B1-5
3. The document should recognize the greater environmental and fiscal benefits of using natural materials instead of concrete. We do not agree that Alternative 3 necessarily would create more vehicle trips to import materials. In fact, a single wooden wall would significantly reduce the number of vehicle trips. Concrete walls require two walls as forms, potentially doubling the number of trips. Trips for the steel and concrete only add more. Additional benefits of a wooden, soldier pile, rock and/or earthen berm walls include a quicker, less labor-intensive job, quieter construction and a less expensive wall, especially in the cases of the wooden or soldier pile walls. Also, existing trees could be incorporated into a wall that uses natural materials, thereby reducing the number of trees that need to be removed from the project. Another benefit would be reduced greenhouse gases (GHG). Concrete, and the cement used in it, is one of the largest sources of industrial process-related emissions (USEPA, Hanle et al., undated. https://www3.epa.gov/ttnchie1/conference/ei13/ghg/hanle.pdf). One more comment, if a goal is to ultimately remove the concrete channel (as much as feasible), as Friends believes, the construction of the proposed concrete wall is in direct conflict with that goal. B1-6 B1-7
4. Upstream of College Avenue, the schematic location of the wall would be problematic for one of the major entrances to the College of Marin campus. A new Learning Center is being built along College Avenue (see discussion in Cumulative Impacts below). B1-8
5. The District should work with the College of Marin and Marin County Parks, and their respective landscape architects and designers, to ensure any new flood walls meet the project objectives for public access and recreation. The flood walls will also necessitate railings in certain locations. Friends recommends walls and railings that are attractive, transparent and that maximize the public's visual and audible interaction with the creek. Concrete walls are inherently hard, physical barriers, and often unattractive (Fig 3.1-18). Friends disagrees with characterization of aesthetics and visualization in Unit 3 and the impacts of the proposed concrete wall (page 3.1-27). The visualization from the right side of the creek is disingenuous. A visualization from the left side of the creek would better illustrate its impacts. Such a wall would significantly obstruct views for users on the left side of the creek, especially if and when the MUP gets relocated to this side of the creek. Similarly, such a wall could be considered a substantial deterioration of the recreational quality of unnamed paths #1 and #2 (page 3.12-11). We also disagree with the conclusion that an Alternative 3 flood wall would necessitate closure of the unofficial Path #2 (page 5-49). B1-9 B1-10 B1-11 B1-12

If the District believes that the wall shown in Figure 3.1-18 is preferred, it should make findings that it meets the project objectives better than those presented in Alternative 3 in terms of (1) environmental benefits, (2) public access and recreation, and (3) fiscal responsibility (complete with estimates from qualified contractors on different wall costs). Friends believes this would be hard to do. B1-13

Pump Station in Granton Park

The District should work with the College of Marin to explore alternative power sources and locations/treatments for above ground improvements. This is particularly true if the pump station will deal with some of the stormwater from the campus; Granton park neighbors would probably appreciate this kind of collaboration to address local drainage problems. The future is tending toward more solar and battery power. College of Marin has existing solar and battery power just downstream that could be used for the pump station. Even if the College's solar/battery power is unavailable, the District should have a plan to convert the pump station to solar and battery power sooner rather than later, instead of committing to petroleum and internal combustion engine energy. B1-14

The location of the pump station currently has a handsome view to Mt Tamalpais. If the above ground improvements cannot be relocated to College of Marin property, they should be painted a color that will reduce their presence (i.e., a tree bark color). B1-15

Further, the vegetation referred to in the document that would visually screen the above ground elements of the pump station is most likely to be removed during construction. A mitigation measure should be included that would ensure vegetation is restored and maintained and would provide adequate visual screening. The District should consult with the College of Marin, Marin County Parks, and the CNPS on such vegetation. B1-16

Tree Removal

The District refers to a USACE policy allowing the USACE to require that all trees within 15 feet of the concrete channel be removed. This would have a significant impact on the biological, visual, and aesthetic resources in the project vicinity. For example, it appears many of the coast redwoods and a few oaks south of the College of Marin's Learning Resource Center may be removed, and this would completely change the character of the planned campus entrance from College Avenue. The District should aggressively pursue keeping trees along the concrete channel, where they have been for decades without damaging the channel or limiting access to it for maintenance. B1-17

Mitigation Measures

MM 3.1-3: Large Tree Planting

Trees need to develop a good root system in place before they put on height and they can't do that in a box. A study reported by Colorado State University (http://csuhort.blogspot.com/2016/10/what-size-tree-should-i-plant.html) states: B1-18

"...if you plant smaller (and less expensive) plant material and wait a few years, you will realize maximum economic gain and greater visual impact from the smaller plants—and they are less

likely to have problems like circling or girdling roots when they are mature trees. But you may have to wait three years for them to catch up with the larger trees."
It may be necessary to include some large box trees to satisfy public concerns. However, Friends recommends that they be considered additional trees to those required by the regulatory agencies. It would also be easier and more fiscally responsible to replace the smaller trees that do not survive the initial, required monitoring period to meet permit requirements. B1-18 cont.

MM 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities
A 10-foot buffer around special-status plants seems barely adequate. Responsiveness to the onsite biological monitor should be adequate to ensure avoidance. B1-19

Cumulative Impacts
Cumulative Project No. 23, should be expanded to include the section of creek between College Avenue and Stadium Way and, importantly, note that it envisions moving the MUP (Route 20) to the other (left) side of the creek. Additionally, the document should include analysis how the preferred project, and Alternative 3, could impact the MUP if and when it is relocated. B1-20

College of Marin's new Learning Resource Center building and its surroundings (landscape and hardscape) should be added as a Cumulative Project. Additionally, the document should include analysis of how the project and Alternative 3, could impact the Learning Resource Center, the planned public entrance at that location, and its greater surroundings. B1-21

Environmental Superior Alternative
Friends does not fully support the finding that Alternative 2 is the "Environmentally Superior Alternative." Yes, restoration of natural creek functions in Allen Park with a boardwalk per Alternative 2 better meets the project objectives than the proposed project or Alternative 1. However, a combination of Alternative 2 and 3 would provide even more benefits, especially when it comes to the environment, public access and recreation, and fiscal responsibility (see discussion above). B1-22

In the event that the Town of Ross does not support the preferred project, Alternative 2, or Alternative 3, Friends recommends the District quickly move forward with a combination of Alternative 1 and Alternative 3. B1-23

There is also the possibility that the Allen Park project, the walls, the pump station, or other project elements, cause delays for one or more reasons. However, the Lower COM Corte Madera Creek Restoration Project could be approved without being subject to any of the issues that create such delays. The District should have a strategy for CEQA approval of the Lower Corte Madera Creek Restoration Project so that it can proceed in permitting and funding in the event that the larger project gets delayed. The Lower COM Corte Madera Creek Restoration Project, as a shovel ready project, will be very attractive to funders and could be realized within two or three years. B1-24

Corrections

Many of these corrections could have been avoided if the authors had used the current 65% design and reviewed the Design Basis Report for the Lower COM Project. All figures should be revised to show the correct footprint for the Lower COM Project. Specifically, the staging area added during preparation of the DEIR should be removed; it is the location of a turn-around for emergency vehicles required by the Kentfield Fire District; it was installed in 2020 and has never been shown as a staging area on any of the project design plans. Second, a planted area beyond the multi-use path on the left bank should be removed from any figure in which it is shown. In addition, other errors could have been avoided if the Admin Draft had been reviewed by someone familiar with the area. B1-25

Page 2-1, Page 3.6-2
Use "San Anselmo Creek and Ross Creek merge to form Corte Madera Creek west of the Lagunitas Road Bridge." B1-26

Page 2-14, Page 3.1-6
Use Stadium Way, not Stadium Avenue B1-27

Page 2-23
Rock and fill energy dissipators, a vegetated bioretention basin, and boulder-lined bioswales would be installed within the newly created ~~channel~~ habitats, including the transition zone.

A vest-pocket park ~~would be created~~ adjacent to the existing multi-use path would be enhanced~~. The upland habitat around the pocket park would be enhanced~~ by planting native ~~understory~~ vegetation ~~beneath the existing trees~~. The two existing trees in the park would be preserved. B1-28

Page 2-25; Page
Figure 2.5-8 The area west of the project should be labeled **College of Marin Maintenance and Operations Facility** B1-29

Page 2-26
Table 2.6-1 Total project area for Lower COM project is 80,419 sq ft B1-30

Page 2-27; Page 3.3-11; Page 3.9-18
Figure 2.6-1; Figure 3.3-3; Figure 3.9-3 Remove staging area shown in COM project area. See Sheet C17 of 65% design plans for designated staging area. B1-31

Page 3.1-8
The wrong photo was used for Figure 3.1-5 B1-32

Friends' Comment letter on CMCFRRP, Phase 1 DEIR
March 15, 2021
Page 7 of 9

Page 3.2-12; 3.10-10
Figure 3.2-2; Figure 3.10-3 The site of COM's M&O Facility is mapped as Park (green). It should be mapped as College Campus (brown). B1-33

Page 3.6-22
Miller Pacific (2020) prepared a geotechnical report for the Lower COM Project. It includes recommendations based on the results of soils samples collected in borings on the site. The soil was also tested for hazardous materials and found to meet safety criteria. Geotechnical investigations are described in the Design Basis Report (GDG 2020) B1-34

Page 3.9-8
Figure 3.9-1
The former main channel of Corte Madera Creek, shown in the southeastern corner of the map, is a cut-off slough. It does not connect to the concrete channel. B1-35

Page 3.9-10
In the middle of the page, this statement is found: "Royston (1977, in (USACE, 2010)) estimated that roughly 20 percent of the total length of bank would be subject to 1 foot of erosion per year." This should be re-evaluated. In the 44 years since this statement was published, bank erosion has been much less. B1-36

Page 3.9-21
At the bottom of the page, high water temperature in Corte Madera Creek is attributed to lack of riparian vegetation. Another cause is low streamflow, caused by pumping of groundwater for irrigation and lack of infiltration caused by extensive impermeable surfaces. This discussion should be improved. B1-37

Page 3.9-36
Table 3.9-5 lists eight projects. Numbers 1 and 2 are on Fairfax Creek; all the others are on San Anselmo Creek, not Corte Madera Creek. B1-38

Page 3.9-42
The description in the first paragraph of the Lower COM action is overly general. Some walls will be lowered, but the channel will not be removed. B1-39

Paragraph 2 calls for soil testing. However, sediments from the project area have been tested and the soil is not hazardous. Test results were presented in the draft Design Basis Report. B1-40

Page 3.9-47
The description of the Lower COM project states that tidal action could mobilize channel and streambed sediments. Sediments are certainly likely to be mobilized by flood events. However, tidal flows are not particularly strong. The statement in the report should be supported by data on water velocities of tidal flows in the Lower COM reach. B1-41

Friends' Comment letter on CMCFRRP, Phase 1 DEIR
March 15, 2021
Page 8 of 9

Page 3.9-48
Mitigation 3.9-1 has been implemented. See above. B1-42

Page 3.12-4
Figure 3.12-2 The COM M&O Facility is mapped as a campus recreation area. Remove that area from the map of recreational facilities. B1-43

Page 3.12-14
Unnamed Paths. Construction of the new wetlands and transition zone would require the temporary closure of unnamed path #3. No walls will be constructed in that area. B1-44

Page 3.13-3
Figure 3-13-1 Unnamed Path #3 is mapped as a bicycle route. It is virtually never used by cyclists and the Marin County Bicycle Coalition does not consider it a bicycle route. B1-45

Page 3.13-4
For clarity, reword:
Bike Route 20, a biking and pedestrian pathway, follows Corte Madera Creek from the Larkspur Ferry Terminal to the Town of Fairfax. Downstream of Stadium Way it is on the left bank of the creek. Moving upstream, it crosses from the left bank to the right bank on the Stadium Way bridge and continues along the right bank as an off-street paved multi-use path, across College Avenue, to the beginning of Unit 4, where it transitions to an on-road bike path adjacent to Unit 4. Throughout its length, Bike Route 20 is heavily trafficked by pedestrians and cyclists, including commuters. B1-46

Page 3.13-8
3.13.6 Impact Discussion
The second paragraph states: "Vehicles traveling the lower College of Marin concrete-channel-removal area would travel on Woodland Road." This is inaccurate. Vehicles traveling to the Lower COM project area would never use Woodland Road. They would travel on Sir Francis Drake Blvd. to College Avenue and into the campus at the entrance to Parking Lot 12, using an easement held by the District across COM property. The Lower COM project would not use Stadium Way or Bike Route 20 to access the project area. The unnamed path #3 would be closed during construction of the Lower COM project. B1-47

Pages 3.15-1 through 3.15-5
Water Supply, Wastewater Management Services, and stormwater

The third paragraph on page 3.15-1 states that a water pipeline crosses the creek at Stadium Way. Note that this pipeline is an above ground pipeline. This paragraph also refers to MMWD's stormwater lines. This is inaccurate: MMWD supplies treated domestic water; towns and the District are responsible for stormwater. B1-48

The first full paragraph on page 3.15-2 states: "An aboveground sewer pipe crosses the creek on the pedestrian bridge at the end of Stadium Way (Figure 3.15-3)." The sewer is a deeply buried pipeline that crosses the creek in an inverted siphon. The aboveground pipeline is a water distribution line.

B1-49

Figures 3.15-1, -2, -3
The legend refers to MMWD stormwater lines. This is inaccurate: MMWD supplies treated domestic water; towns and the District are responsible for stormwater. The Design Basis Report (GDG 2020) describes utilities in the Lower COM project area, most of which are not shown accurately on Figure 3.15-3. Also, the outline of the Lower COM project area is inaccurate. It shows two areas that should be removed from the figure: the inaccurate staging area and an area on the left bank that has since removed from the project. Please use the most recent 65% designs.

B1-50

Conclusion
In conclusion, overall and subject to the comments herein, Friends supports this important project and is in agreement that flood risk reduction, environmental benefits (such as habitat creation and fish passage improvements) and other project objectives are more than worthy. Friends urges the District to increase its public outreach efforts to garner support for the project from the community at large. Countless resources have gone into this project to get it to this stage and we hope that many, if not all, of the project objectives are realized.

B1-51

Sincerely,
Sandra Guldman
Sandra Guldman

2.4.1 Response to Letter B1: Friends of Corte Madera Creek Watershed

B1-1 The commenter states their support for improving channel stability but disagrees that the concrete channel should be made stronger.

This comment is acknowledged. The proposed project would not modify the stability of the concrete channel and would not replace the concrete within the existing channel. However, the District would need to maintain the flood control infrastructure, including the concrete channel, and has an objective of operational reliability to reduce long-term maintenance requirements and costs.

B1-2 The commenter states that when describing the Town of Ross's participating in Section 1.4.4, the term "would" should be used instead of the term "will".

Section 1.4.4 in the Draft EIR has been revised as follows to use "would" instead of "will":

> **1.4.4 Town of Ross**
>
> The Town of Ross owns Frederick Allen Park. The District would ~~will~~ need to obtain Town of Ross approval of an easement for construction and maintenance of project elements on Town property. The District would ~~will~~ enter into a maintenance agreement with the Town regarding maintenance of project elements within Frederick Allen Park. The Town is a responsible agency under CEQA in the review of project elements within Town jurisdiction. In addition, a Town of Ross tree removal permit is required prior to removing trees within the Town of Ross.

B1-3 The commenter states walls should be constructed within the outer edge of the District's right-of-way and should be made of material other than concrete.

Refer to Master Response 2 regarding the feasibility of non-concrete floodwalls and the additional impacts of constructing the floodwall at the outer edge of the District's right-of-way instead of attached to the existing floodwall.

B1-4 The commenter requests that setback walls in Unit 2 not be constructed in the middle of the District's right-of-way.

The floodwall in Unit 2 is proposed to be attached to the existing concrete floodwall, with no setback in the middle of the District's easement.

B1-5 The commenter states that an alternative to building walls in Unit 2 downstream from College Avenue could be to raise the level of the future location of the multi-use path on the left bank of the creek.

Raising the left bank area downstream of Unit 2 in the absence of a floodwall to contain the additional earthen material would not meet USACE engineering criteria as discussed in Master Response 2 and is not a feasible alternative to the proposed floodwall. The proposed project must meet USACE Section 408 requirements, and the proposed floodwall in Unit 2 has been designed to meet those engineering criteria. The taller floodwall in Unit 2 downstream from College Avenue on the left bank adjacent to the floodwall could allow the area to be raised as part of a separate project in the future. The proposed project does not include modifications to the left bank area in Unit 2 for recreational use; raising the elevation of the left bank area for a future multi-use path is not part of the proposed project.

B1-6 The commenter states that the document should consider the greater environmental and fiscal benefits of using natural materials instead of concrete.

The District has considered the environmental benefits and impacts of using natural materials instead of concrete, as discussed under Alternative 3 in Chapter 5 in the Draft EIR. As discussed in Master Response 2, use of engineered streambed material instead of concrete is proposed for protection for the Ross Valley Sanitary District's sanitary sewer line in Unit 4. See Master Response 2 regarding consideration of natural material alternatives.

B1-7 The commenter states that if an ultimate goal is to remove the concrete channel (as much as feasible), construction of the proposed concrete wall would be in direct conflict with that goal.

Removal of the concrete channel is not one of the project objectives listed in Section 2.4 in the Draft EIR. Environmental benefits, which involves the removal of concrete channel, is one of six project objectives but not the ultimate goal of the project. The project will create environmental benefits that extend beyond the concrete channel and the addition of concrete to the existing floodwall to create the flood protection benefits of the project without creating significant adverse environmental impacts is consistent with the project objectives.

B1-8 The commenter states that the location of the wall upstream from College Avenue would be problematic for one of the entrances to the College of Marin campus.

The District met with the College of Marin and discussed the proposed floodwall locations during project planning. The floodwall locations do not appear to be in conflict with any entrance to the College of Marin.

B1-9 The commenter states that the District should work with the College of Marin and Marin County Parks so that any new floodwalls meet the project objectives for public access and recreation.

This comment is acknowledged. The District has met with the College of Marin and Marin County Parks to discuss the floodwalls as it relates to public access and recreation and will continue to work with both of them throughout the design and construction process.

B1-10 The commenter states that the floodwalls will necessitate railings in certain locations.

The floodwalls are not expected to require railings. The floodwalls may require installation of a fence on top of the floodwalls for safety. The fence be similar in appearance and form to the existing fence along both banks of the concrete channel.

B1-11 The commenter disagrees with the characterization of aesthetics and associated simulation for Unit 3 and the impacts of the proposed concrete wall.

The simulation for the floodwall in Unit 3 was prepared using a key observation point from the right bank of the creek. The right bank is the public use location where the Bike Route 20 multi-use path is located, and where public views of the floodwall would be available. A small number of potential viewers would be on the left side of the creek, walking along the unofficial, unnamed pedestrian paths. Given the small number of potential views, these paths were not selected as key observation points. In addition, Figure 3.1-16 shows a visual simulation of the pump station, which is a representative simulation of what the floodwall would like look from the left side of the creek. The floodwall would be approximately 2 to 4 feet in height. Consideration of visual impacts on a future multi-use pathway on the left bank would be speculative because the pathway does not exist in that location today. No design for, or approval of a multi-use pathway relocation to the left bank has occurred.

B1-12 The commenter disagrees with the conclusion that an Alternative 3 floodwall would necessitate closure of the unofficial Path #2.

As discussed in response to comment B1-6 and Master Response 2, the use of natural materials in lieu of the concrete addition to the existing floodwall either would not meet USACE Section 408 criteria for floodwall engineering and design or would require installation of a levee that would have a much larger footprint than a concrete floodwall. A larger levee footprint potentially would block unofficial Path #2.

B1-13 The commenter states that the District should make findings that the floodwalls shown in Figure 3.1-18 in the Final EIR meet the project objectives better than those presented under Alternative 3.

The floodwalls proposed as part of the project meet all project objectives. Alternative 3 meets most of the objectives but may not meet regulatory feasibility because of Section 408 requirements, or the design of the floodwall would result in additional

environmental impacts because of the larger footprint for a levee that would be required to meet Section 408 design criteria. See Master Response 2.

B1-14 The commenter states that the District should work with the College of Marin to explore alternative power sources and locations/treatments for aboveground improvements.

The District has been meeting with the College of Marin to discuss the proposed project and the Granton Park pump station design. The pump station would require energy only when the pump station is running, which would occur only when the water elevation in the creek exceeds the height of the wet well. This would occur only for a few days a year.

B1-15 The commenter states that if the aboveground improvements (e.g., pump station) could not be relocated to College of Marin property, they should be painted a color that would reduce their presence.

The aboveground elements of the pump station would be painted a neutral tone. The pump station elements would be relocated slightly toward College of Marin property. The revised pump station location and neutral color tone are shown in the following revised visual simulation of the pump station, which is included on page 3.1-34 of the Draft EIR:

B1-16 The commenter states that vegetation visually screening the aboveground elements of the pump station most likely would be removed during construction and a mitigation measure should be included to address this removal.

As discussed on pages 3.1-26 and 3.1-27 in the Draft EIR, the stormwater pump station would have a weak visual contrast to the existing view because the area generally is disturbed by the existing road and adjacent development. The impact of the pump station would be less than significant, and mitigation is not required under CEQA for less than significant impacts. However, the District will seek opportunities for on-site replacement plantings to replace trees removed by the proposed project.

B1-17 The commenter states that the USACE policy requiring a 15-foot setback from the channel would have a significant impact on biological, visual, and aesthetic resources in the project vicinity.

This comment is acknowledged. The potential impacts of vegetation removal resulting from the 15-foot setback from the channel are described in the Draft EIR to give a conservative assessment. The USACE policy requiring a 15-foot setback can be exercised at any time by USACE, regardless of whether the project is implemented. The District is advocating to retain trees wherever possible and would apply for a variance to the 15-foot vegetation buffer along the floodwall, to be approved at the discretion of USACE. Proposed project implementation would involve attaching the taller floodwall to the existing floodwall and would avoid removal of trees to construct the taller floodwalls in Units 2 and 3.

B1-18 The commenter states that trees cannot develop root systems in boxes, and therefore could not gain height, and that smaller plant material would contribute to greater economic gain and visual impact.

Mitigation Measure 3.1-3: Large Tree Planting has been proposed to address the significant and unavoidable visual quality impacts related to removal of mature trees in Frederick Allen Park. Although smaller plant material may be a viable option for planting in the park, the visual impact from loss of tree canopy would extend for a longer duration because it would take longer for the trees to establish. Large box trees would include a box size of 24 to 36 inches that would be sufficient for the tree to develop a root system and grow to adequate height. In addition, large box trees would only be used where ecologically appropriate as stated in the mitigation measure. While it would be more expensive than planting small trees, planting with larger box trees would mitigate the impact by reducing the time frame that it would take to replace the tree canopy. The additional cost for the larger trees is within reason to reduce the significant visual impact by reducing the time it takes to re-establish the tree canopy. Refer also to Master Response 1 regarding the recommendation to adopt Alternative 1, which will not involve tree removal or landscaping in Frederick Allen Park.

B1-19 The commenter states that a 10-foot buffer around special-status plants does not seem adequate, and that responsiveness to the on-site biological monitor should be adequate to ensure avoidance.

As stated on page 3.3-70 in the Draft EIR, Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities, would require a biological monitor to be present during construction within a 10-foot buffer of special-status plants, to ensure that impacts would be avoided.

B1-20 The commenter states that Cumulative Project No. 23 should be expanded to include the section of creek between College Avenue and Stadium Way and should note that this project envisions moving Bike Route 20 to the left side of the creek. The commenter indicates that the Draft EIR should analyze how the proposed project and Alternative 3 could impact the relocated Bike Route 20.

The proposed floodwall in Unit 2 would not prohibit the future relocation of Bike Route 20 to the left bank of the creek. Consideration of impacts on a future multi-use pathway on the left bank would be speculative because the pathway does not exist in that location today and no design of, nor approval for a multi-use pathway relocation to the left bank has occurred. The description of Cumulative Project No. 23 on page 4-10 in the Draft EIR has been revised as follows to include the intent to relocate Bike Route 20 to the left side of the bank:

> Corte Madera Creek Project Phase II would include removal of the existing concrete channel from College Avenue <u>to Stadium Way</u> along College of Marin property. The channel bed would be in natural substrate. The right bank would be laid back to create a natural creek slope. The left bank would remain with either an existing concrete wall, a new shorter wall, or large rock embankment to protect an existing Ross Valley Sanitation District owned sewer pipeline that runs parallel to the concrete channel left bank. <u>In addition, the proposed project would relocate Bike Route 20 from the right bank to the left bank of the creek.</u>

B1-21 The commenter states that the College of Marin's new Learning Resources Center building and its surroundings (landscape and hardscape) should be added as a Cumulative Project.

Table 4.3-1: Projects Considered in Cumulative Impact Analysis in the Final EIR has been revised as follows to include the Learning Resources Center Project:

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
<u>34</u>	<u>Learning Resources</u>	<u>The project would construct a three-story, 77,000-square-foot</u>	<u>The project currently is</u>	• <u>The construction would take</u>

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
	Center Project (College of Marin)	replacement facility on the site of the existing building, to address seismic safety and provide upgraded facilities. The associated work would be limited to within the footprint of the existing building, and no alterations would occur to the adjacent pedestrian bridge.	under construction.	approximately 12 months.

Page 4-15 in the Draft EIR has been revised as follows to include the Learning Resources Center Project:

Cumulative Projects

Concurrent construction of the project with cumulative projects proposed within the same viewsheds could result in visual impacts during construction. Projects located within the same viewshed as the proposed project include the access ramp to Corte Madera Creek (#1), Lower Corte Madera Creek Improvement Study (#21), ~~and~~ Corte Madera Creek Project Phase II (#23), and the Learning Resources Center Project (#34).

Page 4-16 in the Draft EIR has been revised as follows to include the Learning Resources Center Project:

The Corte Madera Creek Project Phase II and Lower Corte Madera Creek Improvement Study would be located near the Lower College of Marin Project's concrete channel removal. Additional removal of the concrete channel and flood-control improvements to areas downstream of the concrete channel would appear consistent with the proposed concrete -channel removal and would result in a beneficial aesthetic impact. The Learning Resources Center Project would be constructed before the proposed project and would be in proximity to the floodwall. The new Learning Resources Center would be three stories in height and would appear similar to the existing two-story building at the project site and within the overall context of the college. The proposed increase in floodwall height also would appear similar to the existing floodwall; therefore, the cumulative aesthetic impact from addition of the floodwall and Learning Resource Center would be less than significant. ~~The cumulative aesthetic impact would be less than significant.~~

Toxic Air Contaminants

The only cumulative projects proposed within 1,000 feet of the proposed project include the Access Ramp to Corte Madera Creek (#1), the Cedar Tentative Map (#11), the Corte Madera Creek Project Phase II (#23), ~~and~~ the Sir Francis Drake Boulevard Rehabilitation (#24), and the Learning Resources Center Project (#34).

Page 4-17 in the Draft EIR has been revised as follows to include the Learning Resources Center Project:

Toxic Air Contaminants

The cumulative projects and the proposed project would generate toxic air contaminants (TACs) during construction and operation. The proposed project would include a new generator, but the generator would only be used up to 50 hours per year and would not be a considerable source of TACs. Construction of the Learning Resources Center Project would be completed before the proposed project and would not contribute to cumulative TACs because it would not generate TACs during the same time frame as the proposed project's construction. The Access Ramp to Corte Madera Creek and Sir Francis Drake Boulevard Rehabilitation would be constructed a year prior to the proposed project.

Page 4-21 in the Draft EIR has been revised as follows to include the Learning Resources Center Project:

The only cumulative projects located close enough to the proposed project to result in cumulative impacts on cultural resources are the Access Ramp to Corte Madera Creek (#1) ~~and~~ Corte Madera Creek Project Phase II (#23), and the Learning Resources Center Project (#34). The remaining projects are separated from the project by a considerable distance, with intervening developed areas.

Page 4-23 in the Draft EIR has been revised as follows to include the Learning Resources Center Project:

Cumulative Projects

The Access Ramp to Corte Madera Creek (#1), Cedar Tentative Map (#11), Lower Corte Madera Creek Improvement Study (#21), Corte Madera Creek Project Phase II (#23), ~~and~~ Sir Francis Drake Boulevard Rehabilitation Project (#24), and the Learning Resources Center Project (#34) would occur in proximity to portions of the project.

Page 4-24 in the Draft EIR has been revised as follows to include the Learning Resources Center Project:

Cumulative Projects

The cumulative projects identified in Table 4.3-1 would likely require transport of hazardous materials on Highway 101 and Sir Francis Drake Boulevard during construction. Construction of cumulative projects #1 through #5, #16, #18, ~~and~~ #22 through #25, and #34 would require transport of small volumes of hazardous materials for vehicle and equipment operations during construction.

Page 4-25 in the Draft EIR has been revised as follows to include the Learning Resources Center Project:

Handle Hazardous Materials within 0.25 Mile of Schools

As discussed in Section 3.8 Hazards and Hazardous Materials, the project is located within 0.25 mile of three schools. The only cumulative projects located within 0.25 mile of the same schools include the Access Ramp to Corte Madera Creek (#1), ~~and~~ Corte Madera Creek Project Phase II (#23), and the Learning Resources Center Project (#34).

Page 4-30 in the Draft EIR has been revised as follows to include the Learning Resources Center Project:

Cumulative Projects

The Access Ramp to Corte Madera Creek (#1), the Cedar Tentative Map (#11), the Lower Corte Madera Creek Improvement Study (#21), Corte Madera Creek Project Phase II (#23), ~~and~~ Sir Francis Drake Boulevard Rehabilitation Project (#24), and the Learning Resources Center Project (#34) are located within 1,000 feet of portions of the project.

Noise and Vibration

The proposed project and cumulative projects would only generate substantial noise and vibration during the construction phase. Cumulative noise and vibration impacts would, therefore, only occur if the proposed project and cumulative projects within 1,000 feet of the proposed project were constructed at the same time. The access ramp to Corte Madera Creek, ~~and~~ Sir Francis Drake Boulevard Rehabilitation, and Learning Resources Center Project would be constructed prior to the proposed project and would not cause a cumulative noise impact.

Page 4-34 in the Draft EIR has been revised as follows to include the Learning Resources Center Project:

Cumulative Projects

Several of the cumulative projects will require removal of trees, including the following:

- San Anselmo Creek flood control – nursery basin site (#3)
- Hillview pump station and stormdrain (#5)
- Brownridge tree removal (#12)
- Cooney tree removal (#14)
- Real Equity tree removal (#20)
- Lower Sleepy Hollow Creek Improvements (#22)
- Corte Madera Creek Project Phase II (#23)
- Learning Resources Center Project (#34)

Cumulative Projects

Cumulative projects located within the geographic scope of analysis include the Winship Avenue Bridge Replacement Project (#6), the access ramp to Corte Madera Creek (#1), a number of minor structures, tree removal, and land-use modifications (projects #7 #8, #9, #10, #11, #12, #13, #15, #17, #19, and #20), ~~and~~ the Marin Health Care District, and the Learning Resources Center Project (#34).

B1-22 The commenter states that they do not fully support the finding that Alternative 2 is the "Environmentally Superior Alternative."

The rationale for selection of Alternative 2 as the Environmentally Superior Alternative is provided on pages 5-37–5-46 in the Draft EIR. While Alternative 2 is the Environmentally Superior Alternative, District staff are recommending adoption of Alternative 1 for the reasons discussed in Master Response 1.

B1-23 The commenter states that if the Town of Ross does not support the proposed project, Alternative 2, or Alternative 3, they recommend that the District quickly moves forward with a combination of Alternative 1 and Alternative 3.

See Master Response 1 regarding staff recommendation to adopt Alternative 1.

B1-24 The commenter states that the Lower College of Marin Project's concrete channel removal could be approved, even if the work in Frederick Allen Park, floodwalls, pump station, and other project elements are delayed.

The ability to proceed with construction of the lower College of Marin project element separate from other project components is noted. See Master Response 1 regarding the approach to achieving the project schedule for construction in 2022.

B1-25 The commenter presents various corrections to the Draft EIR, based on the current 65 percent design and Design Basis Report for the Lower College of Marin Project.

Figures 2.6-1, 3.3-3, 3.9-3, and 3.15-3 have been revised as follows to show the correct footprint for the Lower College of Marin Project. These maps do not include a staging area at the location of a turn-around for emergency vehicles required by the Kentfield Fire District nor a planted area beyond the multi-use path on the left bank of the creek:

Figure 2.6-1 Staging, Stockpile, and Temporary Work Areas

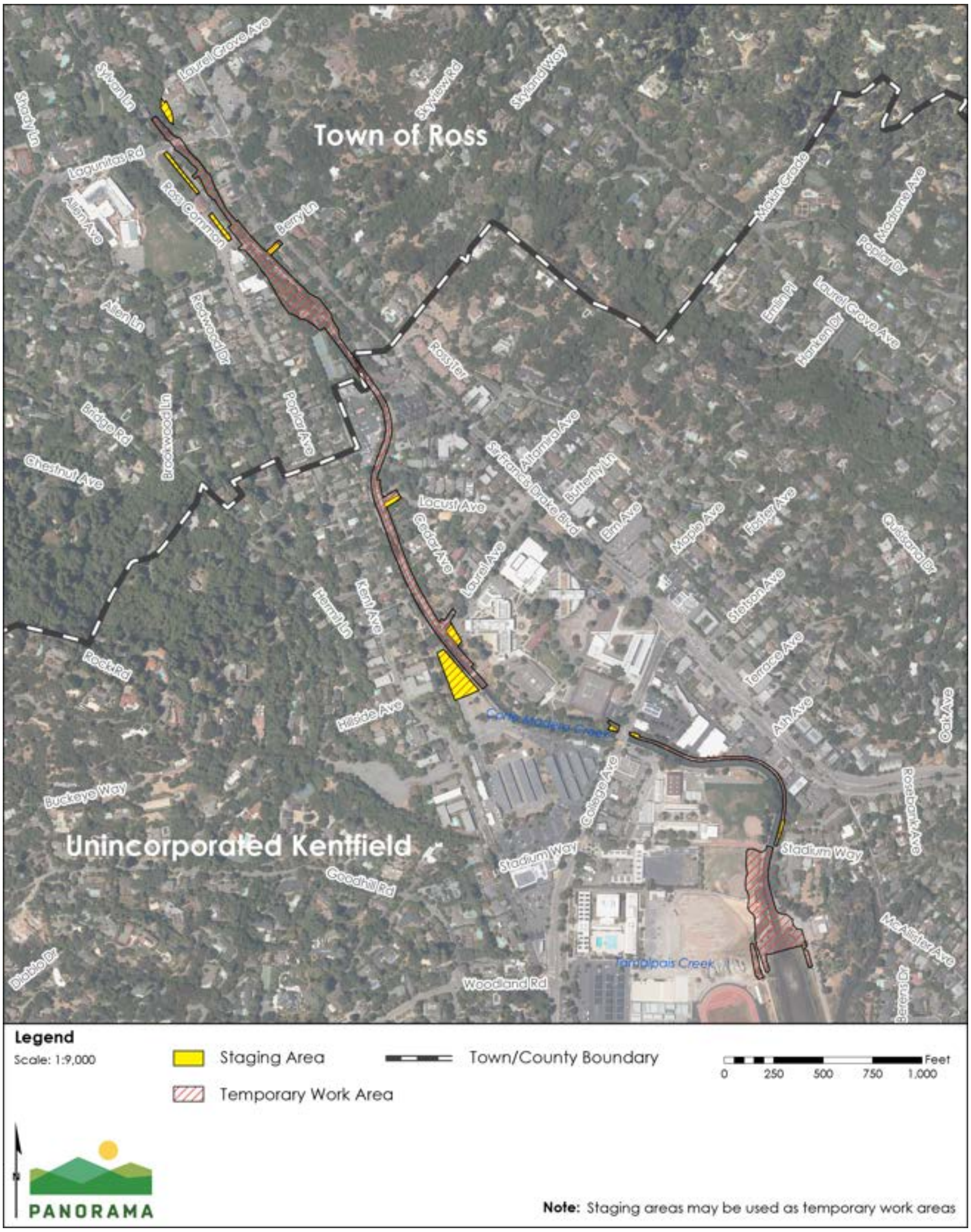

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Figure 3.3-3 Habitat Types within Project Area (Map 3 of 3)

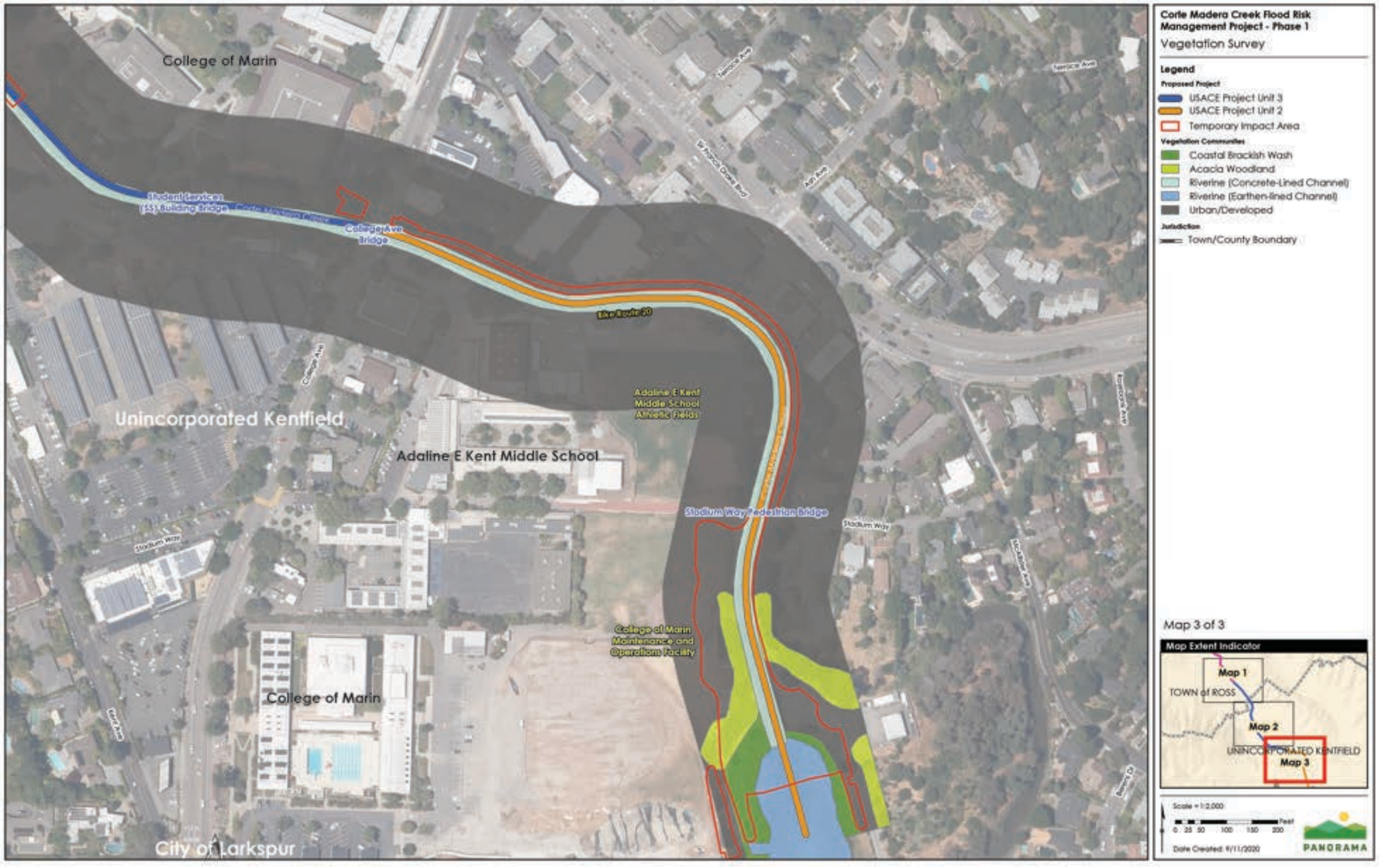
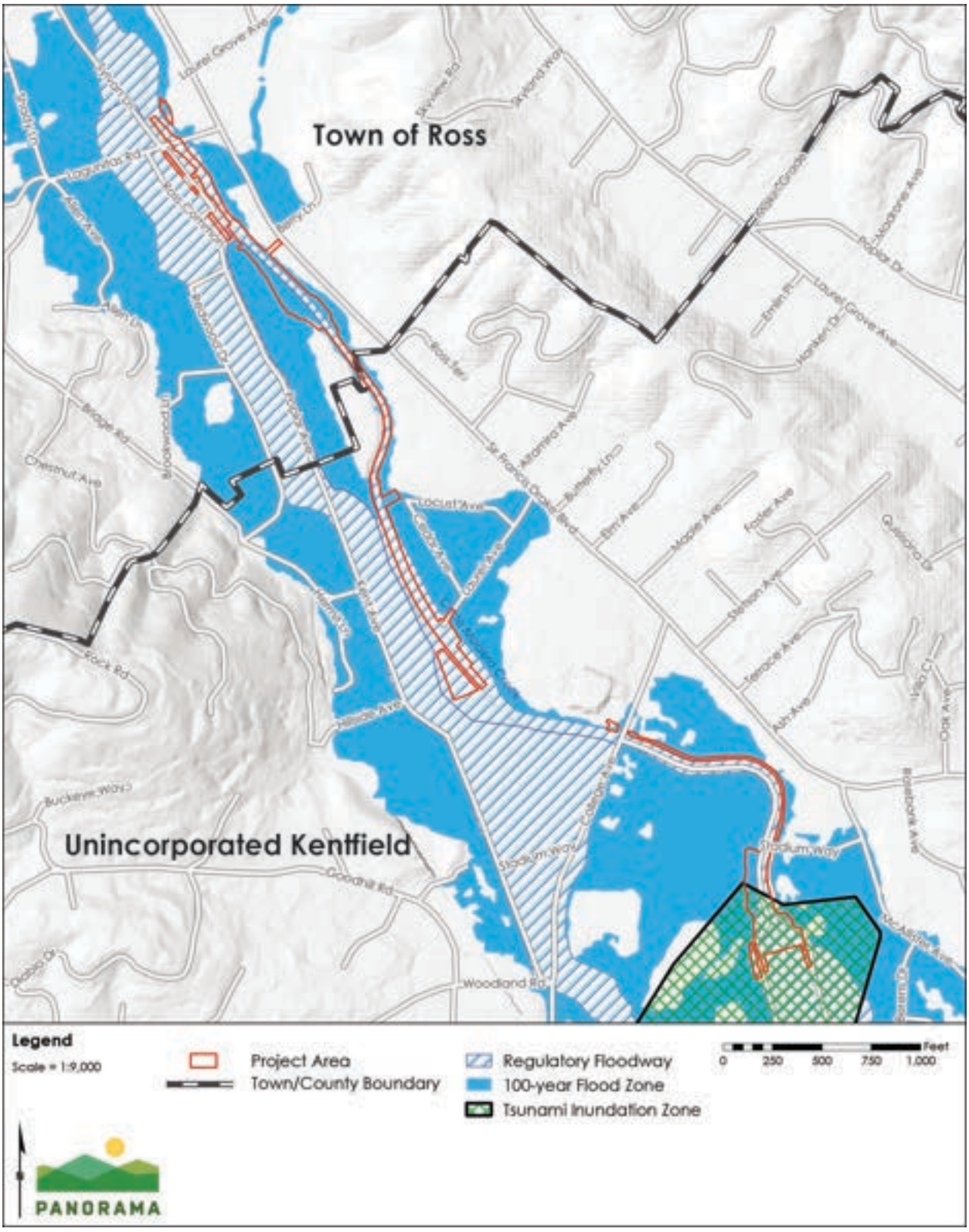


Figure 3.15-3 Utilities and Service Systems in the Project Area (Maps 3 of 3)

Figure 3.9-3 Floodway and Tsunami Inundation Zones



B1-26 The commenter states that text should be updated on page 2-1 and page 3.6-2 in the Draft EIR to say, "San Anselmo Creek and Ross Creek merge to form Corte Madera Creek west of the Lagunitas Road Bridge."

Page 2-1 and page 3.6-2 in the Draft EIR have been revised as follows:

> San Anselmo Creek and Ross Creek merge to form Corte Madera Creek west of the Lagunitas Road Bridge ~~flows into Corte Madera Creek west of Greenbrae at the confluence with Ross Creek~~.

B1-27 The commenter states that the term "Stadium Way" should be used and not "Stadium Avenue."

Page 2-14 in the Draft EIR has been revised as follows to use the term "Stadium Way":

- **Habitat-enhancing elements.** Creek habitat would be enhanced by replacing the concrete channel with an earthen channel and vegetation downstream from Stadium Way. ~~Avenue.~~

Page 3.1-6 in the Draft EIR has been revised as follows to use the term "Stadium Way":

> Lower Unit 3 and Unit 2 within the Kentfield area share similar characteristics as upper Unit 3 within the Town of Ross. Unit 3 extends from Kentfield Hospital downstream to just south of Stadium Way ~~Avenue~~. Bike Route 20 continues through Kentfield adjacent to the right bank of the creek, eventually crossing to the left bank at the Stadium Way ~~Avenue~~ Bridge.

B1-28 The commenter provides direct text edits for page 2-23.

Page 2-23 in the Draft EIR has been revised as follows to respond to the commenter's direct text edits:

> Rock and fill energy dissipators, a vegetated bioretention basin, and boulder-lined bioswales would be installed within the newly created ~~channel~~ habitats, including the transition zone.
>
> A vest-pocket park ~~would be created~~ adjacent to the existing multi-use path would be enhanced. ~~The upland habitat around the pocket park would be enhanced~~ by planting native ~~understory~~ vegetation ~~beneath the existing trees~~. The two existing trees in the park would be preserved.

B1-29 The commenter states that in Figure 2.5-8 in the Draft EIR, the area west of the project site should be labeled "College of Marin Maintenance and Operations Facility."

Figure 2.5-8 in the Draft EIR has been revised as follows to include a label for the College of Marin Maintenance and Operations Facility:

Figure 2.5-8 Lower College of Marin Concrete Channel Removal Habitat Creation

B1-30 The commenter states that the total project area for the Lower College of Marin Project's concrete channel removal is 80,419 square feet.

Table 2.6-1 in the Draft EIR has been revised as follows to note the correct area for the Lower College of Marin Project:

Unit 2	Floodwall (segment #1)	4,750	950	5,700
	Lower College of Marin concrete channel removal	0	80,419~~86,250~~ [a, b]	80,419~~86,250~~

B1-31 The commenter states that the staging area shown in the College of Marin Project area should be removed from Figures 2.6-1, Figure 3.3-3, and Figure 3.9-3.

Figures 2.6-1, Figure 3.3-3, and Figure 3.9-3 in the Draft EIR have been revised to remove the staging area shown in the College of Marin Project area as shown in response to B1-25 above.

B1-32 The commenter states that the wrong photo was used for Figure 3.1-5 in the Draft EIR.

Figure 3.1-5 has been updated with the correct photo in the Draft EIR, as shown in response to comment A5-15.

B1-33 The commenter states that the College of Marin's Maintenance and Operations Facility is mapped as Park (green) and should be mapped as College Campus (brown) in Figure 3.2-2 and Figure 3.10-3 in the Draft EIR.

Figure 3.2-2 and Figure 3.10-3 have been updated as follows in the Draft EIR, to map the College of Marin's Maintenance and Operations Facility correctly as College Campus:

Figure 3.2-2 Sensitive Receptors within 1,000 Feet of the Project Area

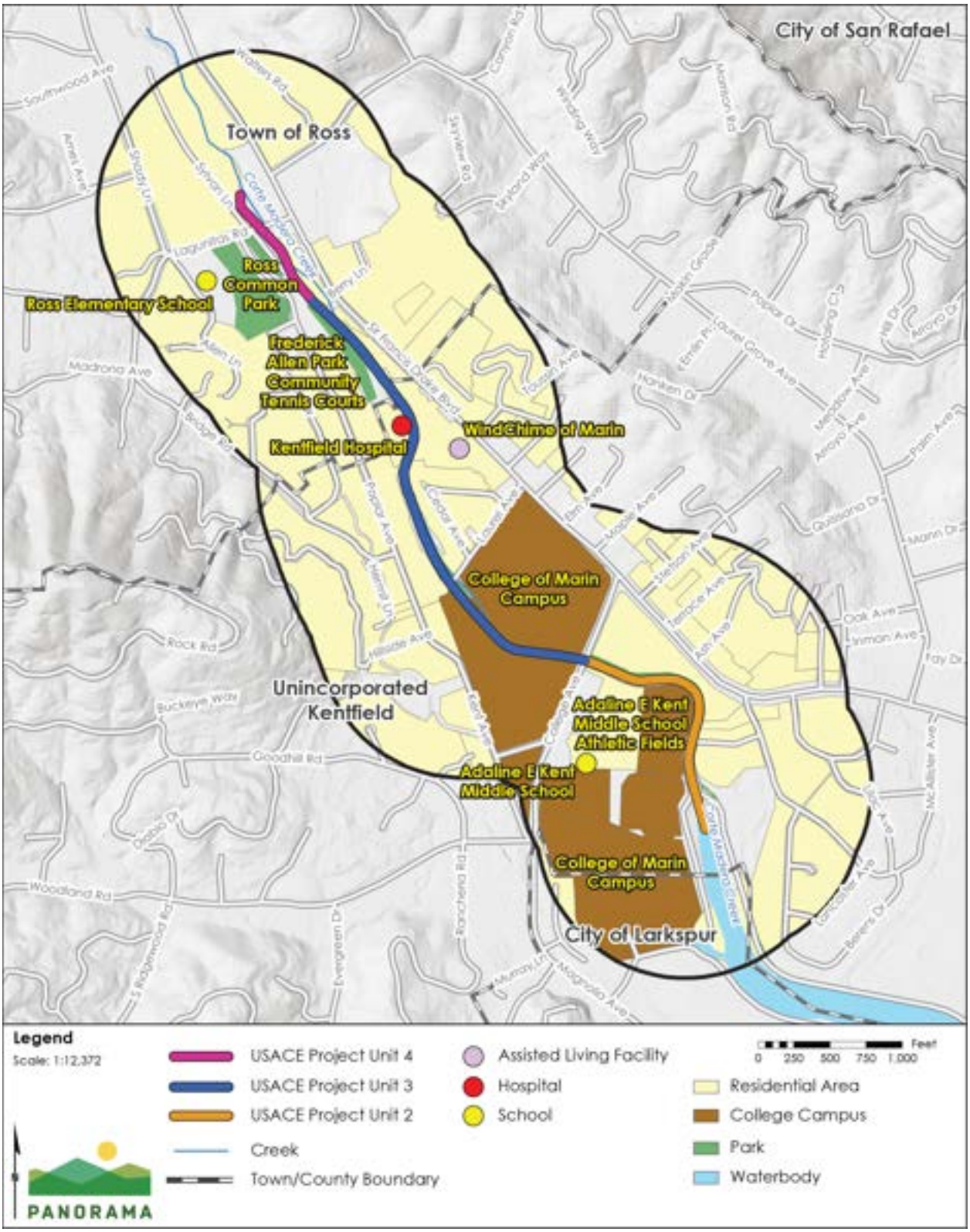
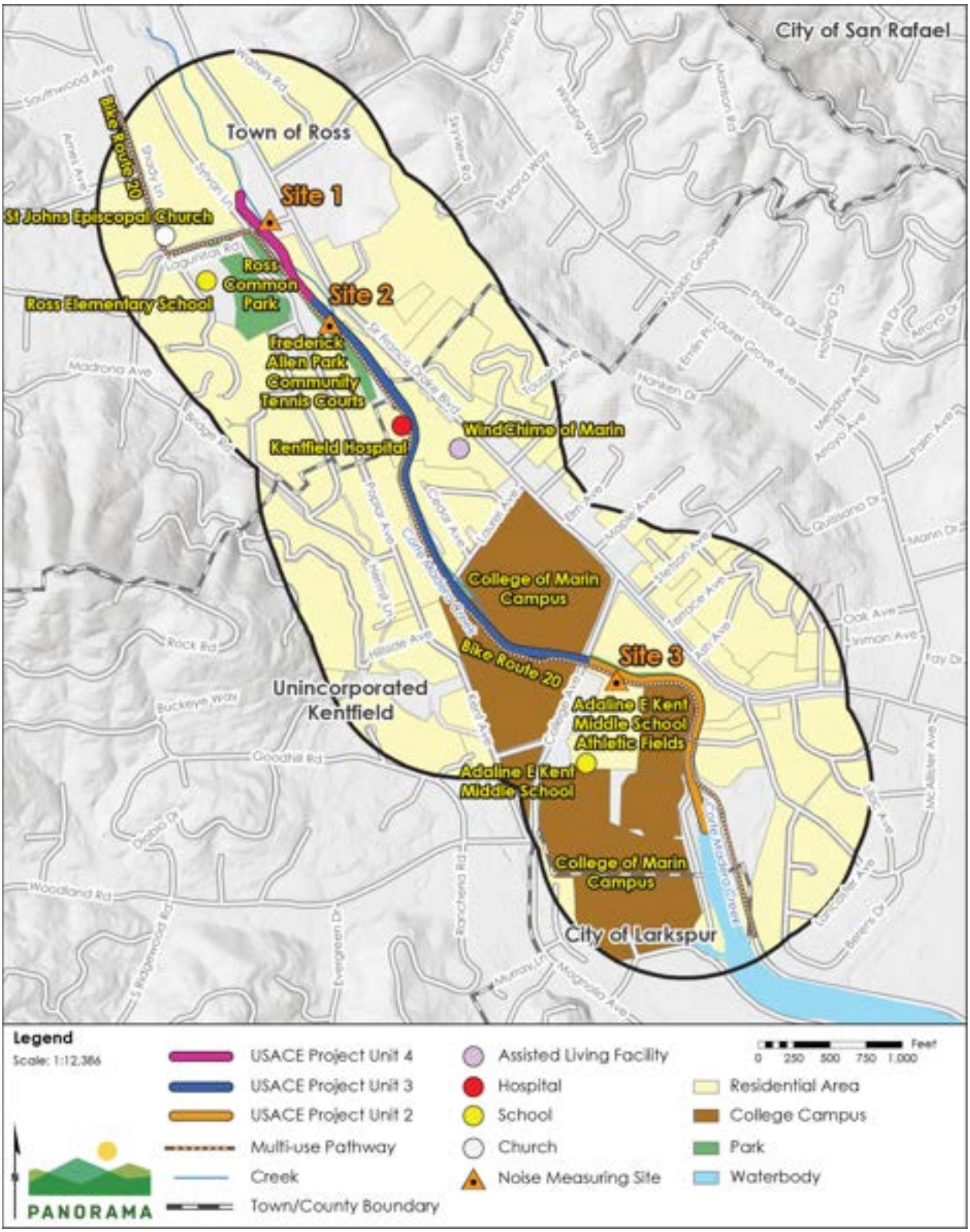


Figure 3.10-3 Noise Measuring Sites and Sensitive Receptors within 1,000 Feet of the Project Area



B1-34 The commenter states that Miller Pacific prepared a geotechnical report for the Lower College of Marin Project and includes recommendations based on the results of soils samples collected in borings on the site.

The Miller Pacific geotechnical report recommends that design of new structures be in accordance with the provisions of the 2019 California Building Code or subsequent codes that are in effect when final design of the proposed project is prepared. As described on page 3.6-21 in the Draft EIR, the Lower College of Marin Project's concrete removal would not introduce any infrastructure that could result in the risk of loss, injury, or death from seismic shaking, and no mitigation is required.

The geotechnical report also recommends that measures be implemented to mitigate the potential for liquefaction that could damage planned improvements in the Lower College of Marin Project area. As discussed above, the proposed project would not include new infrastructure that could be susceptible to liquefaction. As discussed on pages 3.6-21 and 3.6-22 in the Draft EIR, removal of the concrete channel walls would improve stability of the channel banks and reduce the area of concrete structures that could be subject to damage from liquefaction. The impact would be less than significant, and no mitigation is required.

The geotechnical report does not provide mitigation measure recommendations for impacts from fault surface rupture or expansive soils, which is consistent with the analysis in the Draft EIR.

Page 3.6-25 in the Draft EIR has been revised as follows to reference the findings of the Miller Pacific geotechnical report:

> ***Lower College of Marin***
>
> The Bay Mud underlying the Lower College of Marin Project area is weak. The Lower College of Marin Project work involves removal of a portion of the existing concrete channel and riprap, creating a less steeply sloped habitat area and planting the area to establish saltwater marsh and transitional habitat. Riprap would be reinstalled as needed for stability. The reduced slope of the created habitat relative to existing conditions, and use of soil stabilization, including riprap reuse, would generally stabilize the underlying soils. In addition, Marin County Municipal Code requires the Department of Public works to review acceptable soils and geologic reports prior to construction activities located on Bay Mud. ~~Per these regulatory requirements, the geotechnical investigation report for the lower College of Marin concrete channel removal, which is located on Bay Mud, will~~ The Miller Pacific geotechnical report prepared by for the Lower College of Marin Project includes detailed information related to soils matters such as stability, erosion; and settlement, and ~~will~~ includes recommendations for remediating soil instability ~~expansive soils~~, ~~which may includes for example,~~ including removal of these soils and

~~replacement~~ replacing them with ~~engineered~~ imported fill. With adherence to the Marin County Municipal Code, the project would have a less than significant impact due to its location on unstable soil units.

B1-35 The commenter states that the former main channel of Corte Madera Creek, shown in the southeastern corner of Figure 3.9-1, is a cut-off slough and does not connect to the concrete channel.

The McAllister Slough connects to Corte Madera Creek at the earthen channel. The figure shows the extent of McAllister Slough close to the Corte Madera Creek concrete channel in the map scale shown, but it is not connected to the concrete channel as noted in the comment.

B1-36 The commenter states that bank erosion has been much less than the statement from Royston in 1977, indicating that "roughly 20 percent of the total length of bank would be subject to 1 foot of erosion per year."

No recent erosion monitoring data is available. The statement in the Draft EIR reports the findings from Royston. Although the erosion possibly has been less, the findings of Royston do not affect the impact analysis and findings in the Draft EIR.

B1-37 The commenter states that the discussion in the Draft EIR about high water temperatures in Corte Madera Creek should be improved.

Pages 3.9-21 and 3.9-22 in the Draft EIR have been revised as follows to indicate other reasons for high water temperatures in Corte Madera Creek:

> Corte Madera Creek also exhibits high water temperatures. These increased temperatures have been attributed to urbanization of the watershed, specifically the reduction of shaded stream surface area due to loss of riparian vegetation and increased channel width, although less so within Unit 4 (Friends 2008a, in (USACE, 2010). Increased temperatures also have been attributed to low streamflow, caused by groundwater pumping for irrigation, and lack of infiltration, caused by extensive impermeable surfaces.

B1-38 The commenter states that projects 3 through 8 listed in Table 3.9-5 in the Draft EIR are on San Anselmo Creek, not on Corte Madera Creek.

San Anselmo creek is a tributary to Corte Madera Creek, and the future condition hydrologic analysis was conducted to address public scoping comments about the impacts of upstream projects on the hydrology of Corte Madera Creek and the flood control effectiveness of the proposed project.

B1-39 The commenter states that the description about the Lower College of Marin Project on page 3.9-42 in the Draft EIR is overly general. Some walls will be lowered, but the channel will not be removed.

Page 3.9-42 in the Draft EIR has been revised as follows to clarify the concrete removal proposed at the Lower College of Marin Project location:

> ***Unit 2 Lower College of Marin Concrete Channel Removal***
>
> The ~~l~~Lower College of Marin Project ~~concrete channel removal~~ will involve ~~the~~ removal of portions of the concrete-lined flood control channel walls downstream ~~of~~ from Stadium Way to restore natural creek function and create tidal and wetland habitat.

B1-40 The commenter states that sediments from the project area have been tested, and the soil is not hazardous, per the draft Basis of Design Report.

Page 3.9-42 in the Draft EIR has been revised as follows to indicate that the soils in the Lower College of Marin Project area are not hazardous, per the Lower College of Marin Project's Basis of Design Report:

> Much of the exposed area will be revegetated with native vegetation; however, re-exposed channel sediments could be mobilized during tidal flows. The Unit 2 concrete channel removal project area is within the tidal influence of the San Francisco Bay. The Central San Francisco Bay is listed on the 303(d) list for mercury, PCBs, furan compounds, dioxin compounds, pesticides, and other contaminants. Sediments that would be excavated and exposed during construction could potentially be contaminated due to existing known contaminants in the San Francisco Bay, and the construction could result in transport of sediments and associated pollutants into San Francisco Bay. The transport of contaminated sediment to San Francisco Bay would be a significant impact. Soil testing was performed on samples from borings in the Lower College of Marin Project's concrete removal area (Geomorph Design Group, 2020). The soil samples were tested for heavy metals (CAM 17 metals), TPH (gas, diesel, and motor oil), semi-volatile organic compounds and PCBs. No hazardous materials were detected in the samples, and the soil contaminants are within the standard background levels for Marin County. ~~The implementation of Mitigation Measure 3.9-1: Conduct Soil/Sediment Testing, would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized.~~
>
> As mentioned in the analysis of the other project elements construction above, compliance with the Construction General Permit and implementations of the SWPPP and associated BMPs would reduce the potential degradation of surface water quality and potential impacts from construction-related spills or leaks.

Therefore, with the implementation of the SWPPP~~,~~ and associated BMPs, ~~and Mitigation Measure 3.9-1, construction of~~ the ~~l~~Lower College of Marin concrete channel removal would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant ~~with the application of the prescribed mitigation measure~~.

Pages 3.9-47 and 3.9-48 in the Draft EIR have been revised as follows to remove the requirement for Mitigation Measure 3.9-1: Conduct Soil/Sediment Testing:

Following concrete removal, much of the exposed area will be revegetated with native vegetation. However re-exposed channel sediments along the lower banks and streambed could be mobilized during ~~tidal flows or~~ flood events and tidal conditions, possibly building up fine sediment deposition in the reach that could be mobilized during daily tidal cycles, potentially increasing turbidity and transporting associated pollutants into San Francisco Bay. As discussed above, soil sampling in the Lower College of Marin area concluded that the soils are not hazardous, and the proposed project would not expose contaminated soil and sediment. ~~Implementation of Mitigation Measure 3.9-1 would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized during construction.~~ In addition, site-specific bank protection will be installed in areas determined to be at increased risk of erosion or scour and creation and enhancement of vegetated tidal habitat would minimize the risk of erosion and increased turbidity to a less than significant level. Therefore, ~~with the implementation of Mitigation Measures 3.9-1,~~ operation and maintenance in this element would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant ~~with mitigation~~.

B1-41 The commenter states that sediments are likely to be mobilized by flood events in the Lower College of Marin area.

Clarification has been added to the Draft EIR that tidal conditions could build up fine sediment deposition in the reach that could be mobilized during daily tidal cycles. See proposed revisions to the text on page 3.9-47 in the Draft EIR, as provided in response to comment B1-40.

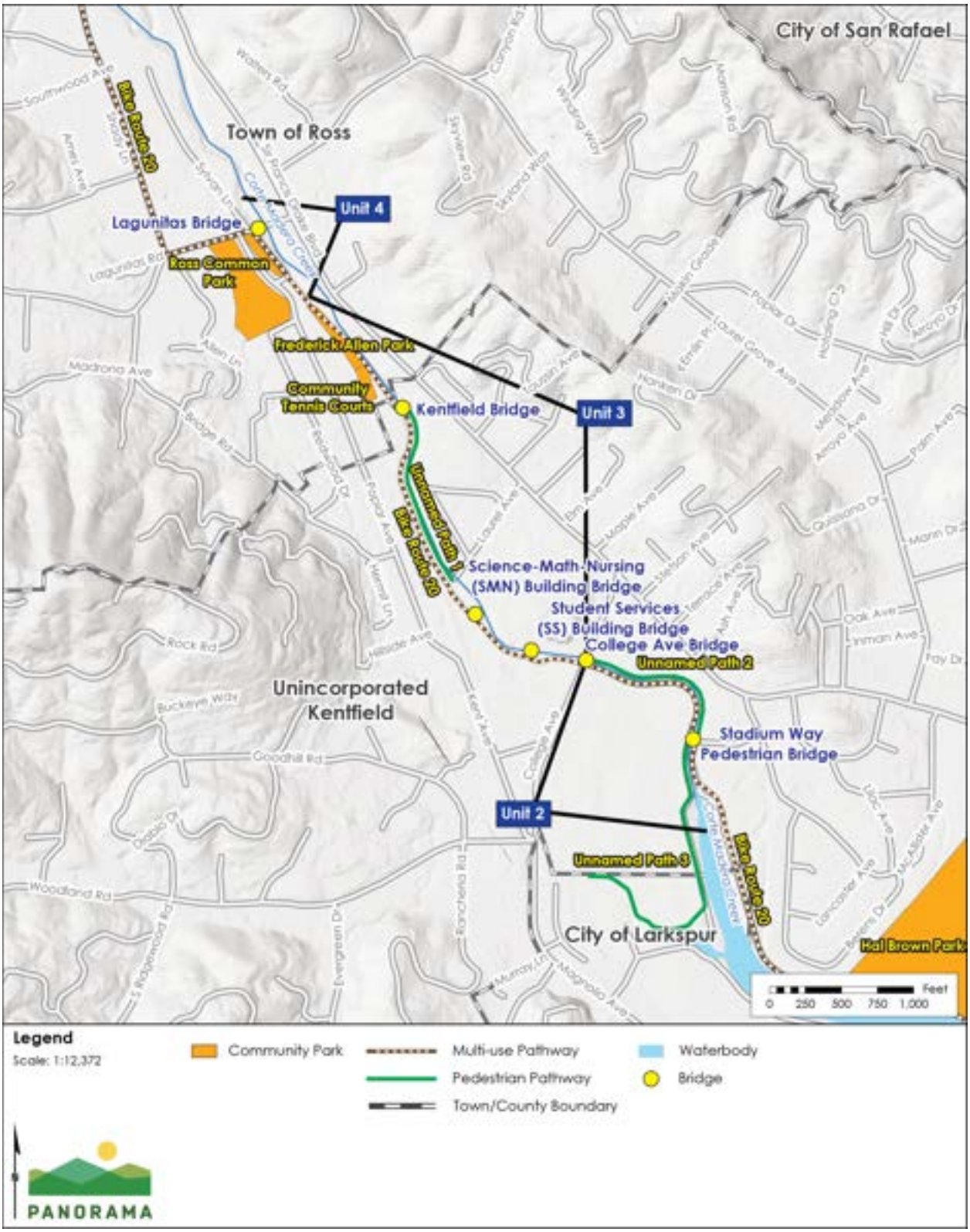
B1-42 The commenter states that Mitigation Measure 3.9-1 already has been implemented.

See the response to comment B1-40. Mitigation Measure 3.9-1: Conduct Soil/Sediment would be required to mitigate operation and maintenance water quality impacts for Unit 3 in Frederick Allen Park, as described on page 3.9-47 in the Draft EIR.

B1-43 The commenter states that the College of Marin Maintenance and Operations Facility should be removed from Figure 3.12-2.

Figure 3.12-2 has been revised in the Draft EIR as follows, removing the College of Marin Maintenance and Operations Facility.

Figure 3.12-2 Parks and Recreational Facilities in the Project Area



B1-44 The commenter states that construction of the new wetlands and transition zone would require the temporary closure of unnamed path #3. No walls would be constructed in that area.

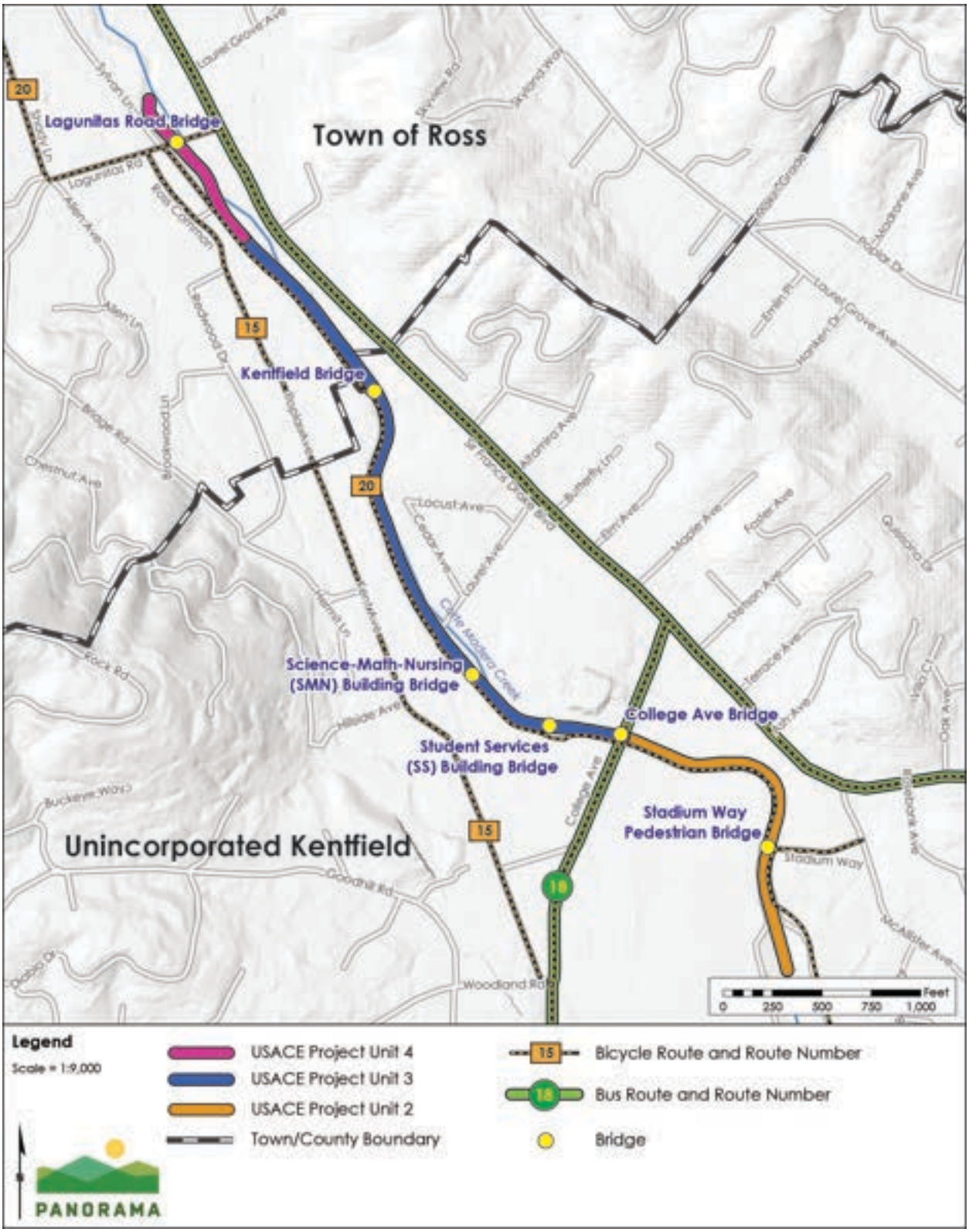
Page 3.12-14 in the Draft EIR has been revised as follows to clarify the reason for temporary closure of unnamed path #3 during construction:

> ***Unnamed Paths***
>
> The project would require temporary closure of unnamed paths #1~~,~~ and #2~~, and #3~~ during construction of floodwalls and temporary closure of unnamed path #3 during removal of the concrete channel and habitat enhancement in Unit 2.

B1-45 The commenter states that in Figure 3.13-1 in the Draft EIR, Unnamed Path #3 is mapped as a bicycle route.

Figure 3.13-1 has been revised as follows in the Draft EIR to remove the bike route from the right bank of the creek south of Stadium Way.

Figure 3.13-1 Local Transportation Network



B1-46 The commenter requests that the text on page 3.13-4 be reworded for clarity.

Page 3.13-4 in the Draft EIR has been revised as follows for clarity:

> Bike Route 20, a biking and pedestrian pathway, follows ~~the right bank of~~ Corte Madera Creek ~~and runs~~ from the Larkspur Ferry Terminal to the Town of Fairfax (Marin County Bicycle Coalition, 2008). ~~Bike Route 20 is a biking and pedestrian pathway.~~ Downstream from Stadium Way, the bike route follows the left bank of the creek. Moving upstream, the bike route crosses from the left bank to the right bank of the creek at the Stadium Way bridge. The bike route continues along the right bank as an off-street paved multi-use path, across College Avenue, to the beginning of Unit 4. The bike route then transitions to an on-road bike path adjacent to Unit 4. ~~The segment of Bike Route 20 within the project area consists of an off-street paved multi-use pathway adjacent to Corte Madera Creek Units 2 and 3. Bike Route 20 transitions to an on-road bike path adjacent to Unit 4. Bike Route 20 crosses over Corte Madera Creek from the right bank to the left bank at the Stadium Way pedestrian bridge and continues along the left bank as an off-street paved multi-use path to Bon Air Road.~~ Bike Route 20~~, within Units 3 and 2,~~ is heavily trafficked by pedestrians and bicyclists, including commuters.

B1-47 The commenter states that vehicles traveling to the Lower College of Marin area would never use Woodland Road and would travel on Sir Francis Drake Boulevard to College Avenue.

Page 3.13-8 in the Draft EIR has been revised as follows to reflect the correct vehicle route to the Lower College of Marin area:

> Vehicles traveling to the lower College of Marin ~~concrete channel removal~~ area would travel on ~~Woodland Road~~ College Avenue and into the College of Marin campus at the entrance to parking lot 12. Limited vehicle access would also occur on segments of Bike Route 20 within Unit 3 and on an informal path within the District's easement on the left bank.

B1-48 The commenter states that the water pipeline that crosses the creek at Stadium Way is an aboveground pipeline, and that towns and the District are responsible for stormwater, not Marin Municipal Water District (MMWD).

The text on page 3.15-1 in the Draft EIR has been revised as follows to clarify that the water pipeline crossing the creek at Stadium Way is aboveground:

> One water pipeline crosses the creek aboveground at Stadium Way in Unit 2.

The text on page 3.15-1 in the Draft EIR has been revised as follows to clarify that MMWD only provides water and not stormwater services.

> Several stormwater lines and MMWD water ~~and stormwater~~ lines are in the project area. There are water supply and stormwater lines that cross the creek just upstream of Lagunitas Road Bridge in Unit 4. Water pipelines are also adjacent to the southern end of Unit 4 and parallel parts of Bike Route 20. Two stormwater lines are near the proposed storm drain pump station in Unit 3. Smaller stormwater lines are scattered throughout Unit 3 and Unit 2. One water pipeline crosses the creek at Stadium Way in Unit 2. See Figure 3.15-1 to Figure 3.15-3 for locations of water pipelines in the project area.

B1-49 The commenter states that the sewer crossing the creek at the end of Stadium Way is a deeply buried pipeline crossing the creek in an inverted siphon.

Refer to response to comment A4-1, which shows revisions to page 3.15-2 in the Final EIR, reflecting the correct alignment of the sewer line.

B1-50 The commenter states that the stormwater lines in Figures 3.15-1, 3.15-2, and 3.15-3 are incorrectly attributed to MMWD, and other utilities are not accurately shown.

Figures 3.15-1, 3.15-2, and 3.15-3 in the Draft EIR have been revised as follows (on the next pages) to reflect the utilities and project components as shown in the Basis of Design Report for the Lower College of Marin area.

B1-51 The commenter states that they support the project.

The District acknowledges the commenter's support for the project.

Figure 3.15-1 Utilities and Service Systems in the Project Area (Map 1 of 3)

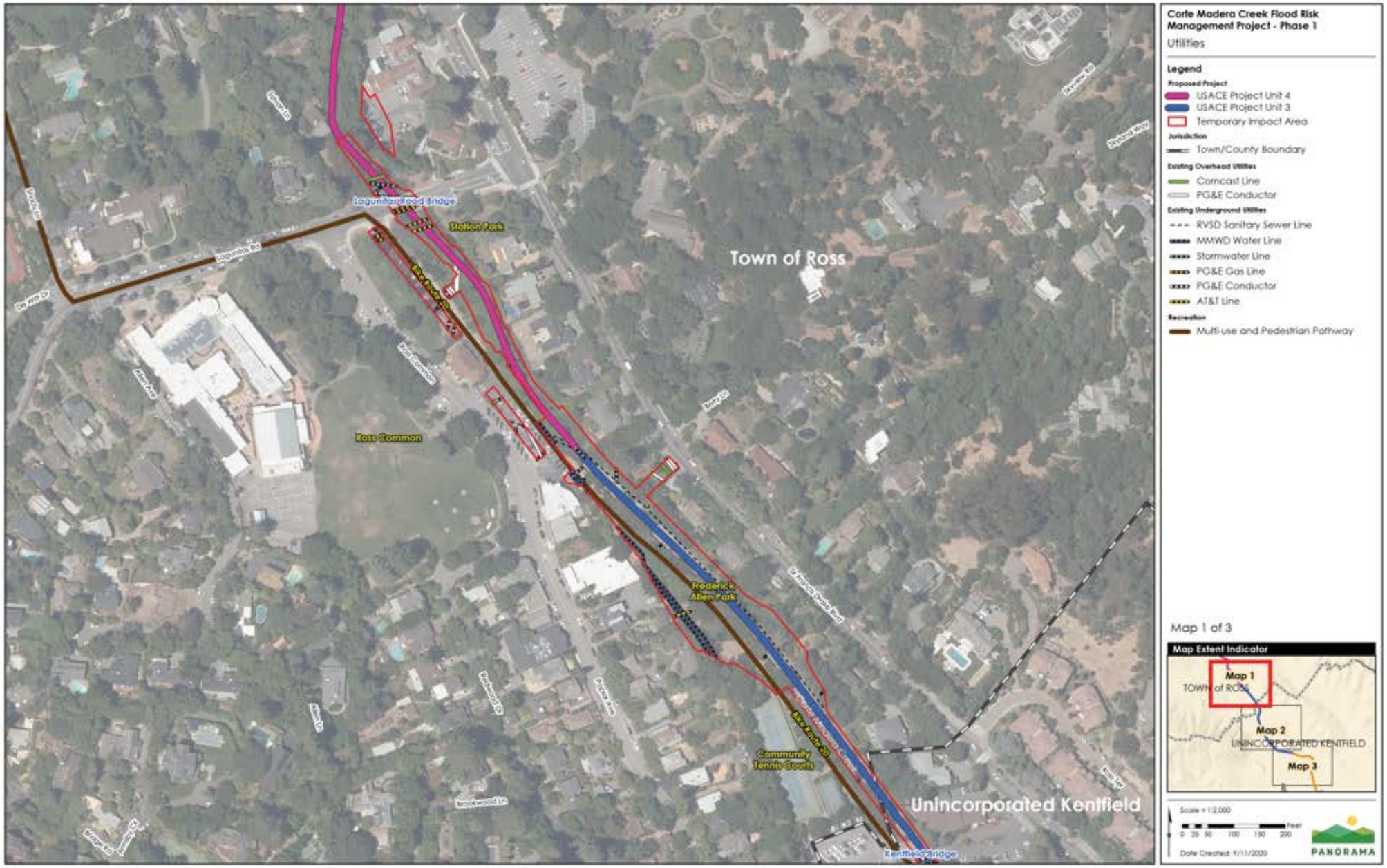


Figure 3.15-2 Utilities and Service Systems in the Project Area (Map 2 of 3)

Figure 3.15-3 Utilities and Service Systems in the Project Area (Map 3 of 3)

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Comment Letter B2

COLLEGE OF MARIN

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835 College Avenue
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415 . 485. 9449

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March 16, 2021

Joanna Dixon
Project Manager
County of Marin – Department of Public Works
3501 Civic Center Drive Suite 304
San Rafael, CA 94903

RE: College of Marin Comments to Corte Madera Creek Flood Risk Management Project, Phase 1 DEIR

Dear Ms. Dixon
Thank you for the opportunity to review the Draft Environmental Impact report for the Corte Madera Creek Flood risk management project prepared by Panorama Environmental Inc. The College of Marin has reviewed the document and we are providing comments in the attached letter.

Please feel free to contact me if you have any questions or need further clarification. I can be reached at 415-485-9449.

Sincerely,

Klaus Christiansen
Director of Facilities Planning, Maintenance and Operations

Attachment

CC:
Greg Nelson, Asst. Superintendent/Vice President College Operations
Isidro Farias, Director of Capital Projects

COLLEGE OF
MARIN

College of Marin Comments to Environmental Corte Madera Creek Flood Risk Management Project Phase 1 Draft Environmental Impact report

Project Description Page 2-20 and 2-23 Floodwalls

The section of floodwall along the left bank of College Ave at the College Ave. Bridge **Figure ES-4** is currently shown on land that is higher than the College Ave. Bridge. This would only serve to guide flows that are high enough to be blocked by the bridges solid wall or funnel flows over College Avenue pavement between the bridge wall and the wing wall if there's a gap between the two. If something is really needed just upstream of the bridge, perhaps raising the existing channel wall a bit higher than the bridge's soffit to contain a bit more flow within the channel. B2-1

The potential setback floodwall along the left bank of Unit three **Figure ES-3** would impact college property preventing future use of the space by the college. B2-2

The potential setback floodwall along the left back of Unit three would create an unsafe hiding space between he new floodwall and the existing fence. B2-3

Project Description Page 2-20 Stormwater Pump Station and Backup Power

The Pump station would encroach on College property preventing any future use of the space by the college. B2-4

The station backup generator as shown in **Figure 3.1-16** would adversely affect the view of Mount Tamalpais from the end of Laurel Ave. B2-5

The potential noise from the equipment could be detrimental to the learning environment. B2-6

Any above ground features should be painted a natural color such as "tree bark warm gray" to blend with the surroundings and reduce their presence. B2-7

Project Description page 2-23 Unit 2 Chanel Improvements

Removal of the existing floodwall would impact college property preventing future use of the space by the college. B2-8

Removal of the existing floodwall would eliminate a heavily used walking path. This path would need to be retained in some fashion. B2-9

COLLEGE OF
MARIN

Project Description Page 2-27 Staging, Stockpile and Temporary Work Areas

The staging area located in Parking Lot 9 on college property **Figure 2.6-1** would take away from parking which is already in limited supply at the college and in Kentfield in general. Any use of college property would need to be returned to equal to or better than their current condition. B2-10

There appear to be five other locations designated for staging that would impact college property. Any use of college property would need to be returned to equal to or better than their current condition. B2-11

Project Description Page 2-28 Tree Removal

Tree Removal Unit 2 **Figure 2.6-4** The Corps appears to have a policy to remove trees within 15' of the channel, if they acted on that they would remove many of the Coast Redwoods and a few Oaks south of the College of Marin Learning Resource Center Project site. This would completely change the character of the potential new campus entrance from College Avenue at the Learning Resource Center project site. B2-12

Project Description Page 2-39 Construction Access

Project access through College of Marin Property **Figure 2.6-6** shows construction traffic using a pedestrian path between the baseball and soccer fields. This path is used by student athletes as well as the public for access to view events. B2-13

Construction access although not clearly shown will need to go through college of Marin parking lots. These lots are generally full of passenger vehicles and are not suited for construction use B2-14

College of Marin parking lots have multiple sub surface utilities including, plumbing, electrical, and geo thermal well that could be damaged by heavy construction equipment. B2-15

Project description Page 2-33 Diversion and Dewatering

Noise from pumps running continuously will have an impact on student learning. B2-16

General comments

Construction activities in the concrete channel will be noisy, has the potential for vibration and shaking on college property. These activities have a negative impact on student learning and should be minimized and/or mitigated. B2-17

Dust concerns affect sensitive groups on campus. B2-18

2.4.2 Response to Letter B2: College of Marin

B2-1 The commenter states that the floodwall along the left bank at the College Avenue Bridge is sited on land higher than the bridge and could result in flows over College Avenue.

The floodwall along the left bank at the College Avenue Bridge is proposed to contain water that overflows the creek bank along the overbank area and back into the concrete channel at the College Avenue Bridge. The area of the proposed floodwall has a lower elevation than College Avenue. A floodwall along the concrete channel edge would prevent flows along the left bank overflow area from re-entering the channel; therefore, this floodwall is proposed as a setback floodwall to direct flows back into the channel. The floodwall location was adjusted slightly in the 60% design, based on the latest survey data. The District will provide the updated floodwall design to the College of Marin for review.

B2-2 The commenter states that the potential setback floodwall along the left bank of Unit 3 would impact college property, preventing future use of the space by the college.

The current design would attach the floodwall to the existing floodwall, with the exception of the short segment of floodwall adjacent to College Avenue (see response to comment B2-1). The District will coordinate with the College of Marin regarding the floodwall location, and it would obtain an easement for any project features on College of Marin property that extend beyond the existing easement.

B2-3 The commenter states that the potential setback floodwall along the left bank of Unit 3 would create an unsafe hiding space between the new floodwall and the existing fence.

As discussed in response to comment B2-2, the current design includes attaching the floodwall to the existing floodwall. In addition, the new floodwall would be approximately 2 to 4 feet high.

B2-4 The commenter states that the pump station would encroach on College of Marin property, preventing any future use of the space by the college.

As stated in Table 2.8-1 of the Draft EIR, The District would obtain an easement from the College of Marin for construction and operation of the stormwater pump station and any additional work within College of Marin property.

B2-5 The commenter states that the station backup generator would adversely affect the view of Mount Tamalpais from the end of Laurel Avenue.

The backup generator would be a maximum of 7 feet in height and located in an area where it would be visible only from the end of Laurel Avenue. The area currently does

not have views of Mount Tamalpais, and the backup generator would not affect views of Mount Tamalpais, as shown in Figures 3.1-15 and 3.1-16 in the Draft EIR.

B2-6 The commenter states that the potential noise from the pump station equipment could be detrimental to the learning environment.

As described on page 3.10-20 in the Draft EIR, the pumps for the stormwater pump station would be installed underground and are not anticipated to create perceptible noise at the College of Marin. The pump station would be operational only during and immediately following storm events, when the pump station is needed to avoid flooding. The only noise produced from the pump station would be from operation of the emergency generator, which would occur only when power is down in the area and up to 50 hours per year. The generator would have a maximum sound level of 82 dBA at 50 feet and would result in noise levels of approximately 76 dBA at 100 feet. Closed windows would provide noise attenuation of 10 to 15 dBA. Students at the nearest College of Marin building (100 feet from the pump station) would experience noise levels from61 dBA to 66 dBA without consideration of noise reduction from other building shielding and ground absorption. This range of noise levels would be equivalent to typical noise levels from normal speech at 3 feet (refer to Figure 3.10-1 in the Draft EIR). The noise is also extremely infrequent and would be isolated to periods when the pump station is running to avoid flooding and there is a power outage requiring operation of the generator. Due to the low level of noise and very infrequent noise generation, the generator would not affect student learning.

B2-7 The commenter states that the aboveground features should be painted a natural color, such as "tree bark warm gray," to blend with the surroundings and reduce their presence.

The aboveground features would be painted a neutral color such as tree bark warm gray. The visual simulation has been updated in the Final EIR to show use of tree bark warm gray paint for the aboveground components, as shown in response to comment B1-15. The raised concrete floodwall would be the same color as the existing floodwall, to blend with the existing color.

B2-8 The commenter states that removal of the existing floodwall would impact college property, preventing future use of the space by the college.

The proposed project would not include removal of an existing floodwall in Unit 2, but rather would involve removal of portions of the existing concrete channel walls. As stated in Table 2.8-1 of the Draft EIR, The District would obtain an easement from the College of Marin for any project areas on its property.

B2-9 The commenter states that removal of the existing floodwall would eliminate a heavily used walking path. This path would need to be retained in some fashion.

As described on page 3.12-11 in the Draft EIR, access along unnamed path #3, located on the right bank of the creek, would be restored after the concrete channel removal is completed. A new informal path segment would be constructed on the right side of the creek, replacing the segment of unnamed path #3 to be affected by the concrete-channel-removal. The new path segment would connect to the existing unnamed path #3 south of the concrete channel removal work area, restoring access along unnamed path #3.

B2-10 The commenter states that the staging area in parking lot 9 on college property would take away from parking space, which already is in limited supply at the college and in Kentfield in general.

Refer to response to comment B1-31. Figure 2.6-1 in the Final EIR has been revised to remove the staging area shown in parking lot 9 on college property.

B2-11 The commenter states that five other locations appear to be designated for staging that would impact college property. Any use of college property would need to be returned to equal to or better than the current condition.

As stated in Table 2.8-1 of the Draft EIR, The District would obtain a temporary construction easement from the College of Marin for any construction activities within College of Marin property. All staging areas would be restored to pre-project conditions following construction.

B2-12 The commenter states that if USACE implements its 15-foot setback policy, many of the coast redwoods and a few oaks south of the College of Marin Learning Resource Center would be removed.

Per USACE's Pamphlet No. 1110-2-18, USACE has the authority to require tree removal within 15 feet of the channel at any time because of the existing floodwalls along Corte Madera Creek. Even if the proposed project is not implemented, USACE could require this tree removal. Tree removal, as required by USACE, is part of existing regulatory requirements and would not be an impact of the proposed project.

B2-13 The commenter states that project access through College of Marin property shows construction traffic using a pedestrian path between the baseball and soccer fields. This path is used by student athletes as well as the public for access to view events.

The path would be used temporarily during the Lower College of Marin project element restoration and planting. The access would occur for a few weeks during initial mobilization and planting.

B2-14 The commenter states that construction access would need to go through College of Marin parking lots, which generally are full and not suited for construction use.

As stated in Table 2.8-1 of the Draft EIR, The District would obtain an easement from the College of Marin for work within College of Marin property.

B2-15 The commenter states that College of Marin parking lots have multiple subsurface utilities that could be damaged by heavy construction equipment.

No proposed project-related construction activities would occur in College of Marin parking lots. The District would obtain an easement from the College of Marin for work within College of Marin property, which would include requirements, as necessary, to prevent damage by heavy equipment traveling through College of Marin parking lots.

B2-16 The commenter states that noise from pumps running continuously would have an effect on student learning.

A dewatering pump would be installed upstream from the Unit 2 work area, approximately 700 feet from Diamond Physical Education Center at the College of Marin (the nearest building to the pump location). The proposed dewatering activities would occur between June 15 and October 15, and the use of dewatering pumps would operate only when in-water work is needed.

Noise from point sources, such as construction equipment, drops off at a rate of approximately 6 decibels (dB) per doubling of distance. For example, a sound level of 80 A-weighted decibels (dBA) at 50 feet from the noise source would be reduced to 74 dBA at 100 feet, 68 dBA at 200 feet, and so on as discussed on page 3.10-4 of the Draft EIR. Pumps would have a maximum sound level of 77 dBA at 50 feet (Table 3.10-7 in the Draft EIR). The dewatering pump would result in noise levels of approximately 53 dBA at 700 feet, assuming no noise attenuations from intervening structures and vegetation. Closed windows would provide noise attenuation of 10 to 15 dB. Students inside the Diamond Physical Education Center would experience noise level close to 38 to 43 dBA (without consideration of noise reduction from other building shielding and ground absorption). This noise levels would be equivalent to typical noise levels in an office (Figure 3.10-1 in the Draft EIR) and would not affect student learning.

B2-17 The commenter states that construction activities in the concrete channel would be noisy and have a negative effect on student learning that should be mitigated.

The closest project component to the sensitive receptors at the College of Marin campus that would involve construction activities in the concrete channel would be the fish pools in lower Unit 3. As described on page 3.10-18 in the Draft EIR, although the overall construction duration at the fish pools would be for several weeks, construction of each pool would last only a few days. Fish pool construction in the area adjacent to the College of Marin would be of short duration, lasting approximately 3 weeks. In addition, noise from the fish pool construction would be reduced by the concrete

channel walls, which would act as a partial noise barrier. For these reasons, construction noise impacts would be less than significant.

B2-18 The commenter states that project dust would affect sensitive groups on campus.

As described on page 3.2-25 in the Draft EIR, Mitigation Measure 3.2-2: Fugitive Dust Measures would be implemented. This mitigation measure would require implementation of BAAQMD-recommended fugitive dust control measures. As described in the Draft EIR, construction activities that are proposed in proximity to the College of Marin would not generate a significant amount of fugitive dust.

Comment Letter B3

Marin Audubon Society

P.O. Box 599 | Mill Valley, CA 94942-0599 | marinaudubon.org

March 17, 2021

Joanna Dixon, Project Manager
Department of Public works
Marin County Center
3501 Civic Center Drive
San Rafael, CA 94903

RE: Comments on Corte Madera Creek Flood Risk Management Project Draft EIR

Dear Ms. Dixon:

The Marin Audubon Society appreciates the opportunity to comment on the DEIR for the Corte Madera Creek Flood Risk Management Plan. This is a multi-benefit project that will go a long way to improve habitat conditions along major lengths of the creek channel. While we strongly support the project we have some concerns about the plan and recommendations for components that should be analyzed in the Final EIR are addressed herein. B3-1

The potential environmental enhancements the project will provide are extensive: restoration of fish passage habitat by removing impediments to flood flows, replacing the inadequate fish ladder, increasing capacity of the channel, creating floodplains, constructing more, larger fish resting pools, restoring natural creek banks and stabilizing slopes which will improve habitats for fish and bird habitat. B3-2

The method of responding to scoping questions is user-unfriendly. It required extensive time to search through the text for the response to our comments. We request that future responses be made directly to comments as is usually done in CEQA processes. B3-3

We request that the following questions and concerns be addressed in the Final DEIR: B3-4

1. Alternatives to concrete - The removal of a large portion of the concrete channel in Unit 2, east of the College we see as a significant ecological benefit to fish, birds and people. However, the plan includes installation of more concrete floodwalls in all units. Hard concrete floodwall structures surface may be cheaper but they provide no environmental benefit.

   We recommend that the DEIR review and evaluate alternative natural materials that could be used, in place of concrete. Wooden planks, logs and other natural materials are a few of the materials that should be considered as alternatives.

   The evaluation should address alternative materials for floodwalls in each of the units, as different materials could be appropriate for different sections. The evaluation should address habitat benefits and bank stability for each.

   We note that the Alternatives Analysis includes alternatives with rock stabilization structures instead of concrete. Rock walls would allow for growth of vegetation, which would be is improvement over concrete walls. Rock walls should be discussed further as to the likelihood of success and ease of growing the vegetation, i.e. evaluated as to the potential for success.

2. Tree Removal - Implementing the Corps of Engineer's requirement that vegetation not be planted within 15 feet of the concrete channel would significantly diminish the habitat value of the creek and lower the environmental benefits of the project. It is urgent that this restriction not be imposed on the project. We urge the County to aggressively pursue an exemption from this requirement. If organizations could be helpful in achieving this goal, please let us know.

   Regarding mitigation for tree loss, since the Habitat Restoration and Monitoring Plan has not been produced and cannot be reviewed as part of this DEIR and the EIR discussion lists only agencies as participating in the Plan development, we express our concern that the interested public would not have an opportunity to comment. We are particularly concerned that the mitigation trees be planted at

B3-4 cont.

B3-5

B3-6

B3-7

Environmentally Superior Alternative. Alternative 1 would reduce the concrete footprint at Frederick Allen Park and replace it with retaining walls made of rock or other natural material. Alternative 3 reduces concrete from Unit 2 and also replaces it with rock to allow plantings to improve habitat

The Environmentally Superior Alternative would combine these features to substantially improve the habitat values of the creek.

B3-7 cont.

Correction: Wildlife Marin Audubon Society has conducted bird counts along Corte Madera Creek from 1978 to 2013, not Friends of Corte Madera Creek (Birds page 3.3-17). Actually, we have conducted the Christmas Count from 1978 to 2019. The Count was not conducted in 2020 due to the pandemic. Clearly the list provided is extensive attesting to the environmental value of the creek. If you would like an updated one, let me know.

B3-8

Sincerely,

Barbara Salzman, Chair
Conservation Committee

2.4.3 Response to Letter B3: Marin Audubon Society

B3-1 The commenter states that they strongly support the project but have some concerns about the plan and recommendations for components that should be analyzed in the Final EIR.

This commenter's support for the project is acknowledged.

B3-2 The commenter states that the potential environmental enhancements the project would provide would be extensive.

These environmental improvements provided by the project are reflected in the project objectives and impact analysis in the EIR.

B3-3 The commenter states that the responses to scoping questions are not user friendly and finding responses is difficult.

The responses to scoping comments are presented in each applicable Draft EIR section, as well as in Appendix A, Notice of Preparation and Scoping Summary Report. Because the comments were considered as the basis for detailed analysis, a reference to the section of the Draft EIR where the comment is addressed is included, rather than providing a detailed response to each comment. This approach is consistent with other Marin County EIRs.

B3-4 The commenter states that future responses to comments and alternatives related to concrete should be addressed in the Final EIR.

The responses to comments in the Final EIR include a detailed response to each comment (provided here).

The concrete floodwalls that are part of the proposed project would be an extension of the existing floodwalls along the creek. The new floodwalls would be installed on top of the existing concrete floodwalls. The proposed project would not install floodwalls in areas where floodwalls do not exist currently and would result in slightly taller floodwalls than current conditions. This type of floodwall extension is needed to comply with the engineering requirements of USACE Section 408 standards. A non-concrete alternative was considered in the Draft EIR as Alternative 3. Refer to Master Response 2 for information on the feasibility of Alternative 3 and non-concrete floodwalls.

B3-5 The commenter states that the alternatives analysis includes alternatives with rock stabilization structures instead of concrete, which would be an improvement over concrete walls.

Refer to Master Response 2 regarding the environmental impacts of non-concrete floodwalls and Alternative 3.

B3-6 The commenter states that implementing the USACE 15-foot setback requirement for vegetation would lower the environmental benefits of the proposed project, and the County should propose an exemption from this requirement.

The USACE policy requiring a 15-foot setback can be exercised at any time by USACE, regardless of whether the project is implemented. The District is proposing to attach the new concrete floodwalls on top of the existing floodwalls, to avoid tree removal behind the floodwalls. The District has discussed the 15-foot setback requirement with USACE and has urged USACE to waive the setback requirement. The District will continue to work with USACE to avoid additional tree removal associated with the 15-foot setback. The District's goal is to avoid and minimize tree removal to the extent feasible.

B3-7 The commenter states that they are concerned about the public not having an opportunity to comment on the Habitat Restoration and Monitoring Plan and on the Environmentally Superior Alternative.

Habitat mitigation requirements cannot be determined until a project alternative is approved; therefore, it is not feasible to develop the Habitat Restoration and Monitoring Plan before County approval of the proposed project or an alternative. Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan specifies the performance criteria and standards that would be applied during plan development and implementation.

Alternative 1 would not reduce the concrete footprint in Frederick Allen Park because Alternative 1 would include only construction of fish pools within Corte Madera Creek adjacent to Frederick Allen Park. No work in Frederick Allen Park is proposed under Alternative 1. Refer to Master Response 1 regarding the staff recommendation to adopt Alternative 1 and Master Response 2 regarding Alternative 3.

B3-8 The commenter states that Wildlife Marin Audubon Society conducted bird counts along Corte Madera Creek from 1978 to 2019, not the Friends of Corte Madera Creek.

Page 3.3-17 in the Draft EIR has been revised as follows to correct the bird count statement.

> Wildlife Marin Audubon Society ~~Friends of Corte Madera Creek Watershed has~~ conducted ~~Christmas~~ ~~Bird Counts~~ bird counts along Corte Madera Creek from 1978 to 2019~~2003~~.

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2.5 Individuals

Comment Letter C1

From: ALAN LUTSKY <LUTSKY@6CALETA.COM>
Sent: Monday, February 1, 2021 1:46 PM
To: cortemaderacreek@marincounty.org
Subject: Caleta Ave Bridge is missing from report

Hi, I noticed that the Caleta Ave Bridge is missing from report? C1-1

Alan Lutsky

Email Disclaimer: https://www.marincounty.org/main/disclaimers

1

2.5.1 Response to Letter C1: Alan Lutsky

C1-1 This comment states that discussion of the Caleta Avenue Bridge is missing from the Draft EIR.

No projects for the Caleta Avenue Bridge are proposed; therefore, Caleta Avenue Bridge is not included in the cumulative projects' discussion in the Draft EIR.

Comment Letter C2

-----Original Message-----
From: Dixon, Joanna <JDixon@marincounty.org>
Sent: Friday, February 5, 2021 2:04 PM
To: Woody Leary <firststreetbooks@yahoo.com>; Corte Madera Creek <cortemaderacreek@marincounty.org>
Subject: RE: Corte Madera Creek Flood Project

Thank you for your comment on the Corte Madera Creek Flood Risk Management Project. If you haven't done so already, please feel free to visit our website to learn more about the proposed project and the alternatives presented in the Draft Environmental Impact Report.

https://www.marinwatersheds.org/resources/projects/corte-madera-creek-flood-risk-management-project

Comments will be accepted through March 17th, 2021.
Thank you,
Joanna Dixon
Associate Civil Engineer
Marin County Flood Control District

-----Original Message-----
From: Woody Leary <firststreetbooks@yahoo.com>
Sent: Friday, February 5, 2021 7:44 AM
To: Corte Madera Creek <cortemaderacreek@marincounty.org>
Subject: Corte Madera Creek Flood Project

I have lived in Kentfield for over 50 years and so much of the joy of the
Kentfield- Ross area is from the beauty of all the lovely trees in our area.
I walk the Creek trail from Kentfield to Ross at least 2 or 3 times at week.
I can't imagine what a disaster it would be to cut down 144 of our mature beautiful trees- Utter destruction to our beautiful creek and path.
My plea is to spare the trees and not destroy our lovely area. I hope the beauty of the area is of primary concern not destruction.
Thank you
Mary Leary
20 Rancheria Road
Kentfield
CA

C2-1

Sent from my iPhone
Email Disclaimer: https://www.marincounty.org/main/disclaimers

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1

You're receiving this message because you're a member of the Corte Madera Creek group from County of Marin.

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2

2.5.2 Response to Letter C2: Mary Leary

C2-1 The commenter expresses concerns about destruction that would be caused by removing trees along the creek as part of the proposed project.

This comment addresses the merits of the project, but not the environmental analysis. The effects of tree removal is analyzed in the Draft EIR in Section 3.1 Aesthetics and Section 3.3 Biological Resources. The Draft EIR found that the aesthetic impact from tree removal would be significant and unavoidable for a period of approximately 10 years, but the proposed landscaping would result in a beneficial aesthetic impact within 20 years. The maximum extent of potential tree removal presented in the Draft EIR is a worst-case scenario that reflects removal of all trees within 15 feet of the existing floodwall. A total of 34 trees would need to be removed to construct the project elements along the channel. The District has proposed attaching the floodwall to the existing floodwall to avoid removal of trees during floodwall construction. The District also would request that USACE not require removal of trees within 15 feet of the existing floodwall. The proposed project would replace all trees removed at the ratios specified in Mitigation Measure 3.3-2b and in accordance with Town of Ross and CDFW requirements for tree replacement. Refer to Master Response 1 regarding staff recommendation to adopt Alternative 1, which would not require removal of trees within Frederick Allen Park.

Comment Letter C3

From: Gary Scales <garrettscales@comcast.net>
Sent: Tuesday, February 9, 2021 5:41 PM
To: towncouncil@townofross.org
Cc: Joe Chinn - Town Manager <jchinn@townofross.org>; Richard Simonitch <rsimonitch@townofross.org>; Patrick Streeter <pstreeter@townofross.org>; Rice, Katie <KRice@marincounty.org>
Subject: Ross Flood Control Project

Dear Mayor and Council-Members,

It is hard for me to believe it was over forty years ago I was a member of the Town Council considering how to improve flood control in Ross. A lot of water has passed under the proverbial bridge. Many millions of dollars have been spend on engineering, environmental and hydrology studies, and yet the channel and fish ladder remain as they were in 1980. C3-1

Actually we did approved a project with community, County and Corps support, but failed to proceed due to lack of funding. It was very similar to what today is being proposed as Option One. C3-2

I strongly support the proposed alternative Option One which will provide flood control and preserve the Frederick S. Allen Park. Allowing the fencing to remain addresses a significant safety issue. Removal of the fish ladder and providing fish resting areas within the channel also are included. Reinforcement of the earthen banks from the end of the concrete channel to the Lagunitas Bridge will provide for a suitable transition zone. The hundreds of studies and water level projections are just estimates and predications. We know Option One will provide a large measure of flood control to the Ross Community. C3-3

I urge you to approve **Option One** and move forward with positive and realistic flood control measures for the Ross community. C3-4

And I am reminded of the wise adage, **Don't let the Perfect be the enemy of the Good.**

Respectfully yours,

Gary Scales
4 Berry Lane
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2.5.3 Response to Letter C3: Gary Scales

C3-1 This comment states that many resources have been spent on engineering, environmental, and hydrology studies. However, the creek and fish ladder remain the same as they were in 1980.

This comment addresses the cost of implementing the project and does not address environmental impacts.

C3-2 This comment states that a project proposal similar to Alternative 1 was approved in the past but failed to proceed because of a lack of funding.

This comment addresses the project history and does not address the environmental impacts of the project.

C3-3 The commenter supports Alternative 1 and summarizes the benefits of implementing Alternative 1.

Refer to Master Response 1 regarding staff recommendation to adopt Alternative 1.

C3-4 The commenter supports Alternative 1.

This commenter's preference for Alternative 1 is acknowledged. See Master Response 1 regarding staff recommendation to adopt Alternative 1.

Comment Letter C4

From: sterling sam <familysam2002@yahoo.com>
Sent: Tuesday, February 16, 2021 6:32 PM
To: Dixon, Joanna <JDixon@marincounty.org>
Subject: Comments on the Draft EIR, Corte Madera Creek Flood Risk Management Project, Phase 1

Joanna,

I have reviewed sections of the Draft EIR for the Corte Madera Flood Risk Management Plan. I have the following comments, and I apologize, ahead of time if the answers are somewhere in the report, which in an online form is difficult to read through and equally difficult to navigate. I live in Ross, along the creek, and have been affected by flooding numerous times.

1) Did the county review past plans for dealing with flood problems in the area, which go back many decades. I believe that the Draft EIR would benefit greatly from incorporating some of those ideas, none of which came into fruition. I reviewed the Friends of Corte Madera Creek Watershed plan from 2017 (prepared by Sandy Guldman), which calls for the removal of the existing concrete channels; they only mentioned the flood of 1982. The huge flaw in their plan is that it depends on all property owners affected to agree to the plan. There was also no plan on compensation for property land lost even if all property owners agreed to the plan. And what of the homes? They would soon be undercut, which is what happened with 1 Sir Francis Drake Boulevard, with partial collapse of their property. Only because it is immediately adjacent to the fish ladder did the county come in to restore the property. C4-1 C4-2

2) The EIR calls for removal of the concrete channel in Allen Park and constructing a restored natural channel and floodplain and aligned pathway. How do you plan on preventing the erosion of this "geomorphically restored channel and floodplain"? Perhaps "grade control structures and bank stabilization"? To the point where it will undermine the courts and cause their collapse. Also, how do you plan on 'funneling' the floodwater from Allen Park back into the Kentfield concrete channel? This presents a huge problem in traditional flood-control channelization, converting natural stream floodwater from a high point (the south end of the Ross post office parking lot) to the low 'floodplain' area of Allen Park and then to a uniform channel cross section, in this case, the concrete channel in Kentfield. What would you do, soil cements on the steeper slopes and vegetation on the shallower ones? I have never seen that successfully done anywhere! C4-3 C4-4

1

a) I see there is no plan to lower the banks in the area NW of Allen Park, that is, in the area of the parking lot for the Ross Post Office. Why not? You will note the vertical drop from the sidewalk behind (east) of the parking lot is much higher than the banks on the other side of the creek. By maintaining the artificially high banks on the west side (where there was a train trestle) you cause the floodwater to increase velocity going into Allen Park and the other side of the bank where the homes are, NW of Allen Park. The post office is an old building, but not one of any historic significance. It could easily be replaced with a modular unit in the 'park' owned by Ross at the corner of Lagunitas and SFDB. C4-5

b) Anything resembling a natural 'floodplain' would have Corte Madera Creek many times wider than it currently is, north of the Stadium Way pedestrian bridge. That cannot be done without wiping out many homes on both sides of the creek, the post office, Allen Park, etc. C4-6

3) Were any of your three hydrology consultants actually out during the middle of the night on New Year's Eve 2005/New Year's Day 2006 to see the floodwater, as I was? I know they weren't because I was the only one out there that night. It is not just the flow depth, not just the flow velocity, but the volume of water, duration of flow, and flow circulation patterns that can only be understood by first-hand observation. And the floods of 1982 and 2005/2006 were relatively mild floods compared with those 60+ years ago. C4-7

4) I see that on May 25-29, 2020 that a two-person crew located and identified existing trees. Did the crew from Stillwater Sciences carry out a survey of the other plants in the creek corridor on July 15, 2020? I read of your plan to replant trees given that many will have to be removed, from Allen Park for example. Many non-native trees are there, Liquidambar styraciflua (Altingiaceae), of the American southeast. There is also Acacia dealbata (Fabaceae) of Australia/Tasmania, and Eucalyptus camaldulensis (Myrtaceae), also of Australia, in the area. Will you be replanting such non-natives/ornamentals again (I hope not), or natives to the riparian community within the temperate redwood rainforest? C4-8 C4-9

5) The plan calls for taller and/or new floodwalls in units 2 and 3 to control flood flows. Have you considered the increased hydraulic roughness caused by large quantities of debris, sediment, rock, etc. causing a reduction in flood conveyance? C4-10

6) None of these many, many plans that have been put fourth over decades have towns assisting homeowners to raise their homes out of the flood zone. Sonoma County has a 'Flood Elevation Mitigation Program', which covers up to 75% of raising a flood-prone residential structure above the 100-year flood level. Perhaps rather than generating more problems with your 'geomorphically restored channel and floodplain', Marin County could do the same. C4-11

a) What plans do you have to restore homeowner's property, both horizontally and vertically, lost from many floods? The NW corner of my property extends well into the middle of the creek. Are there plans for property reassessment & a reduction in property taxes for loss of such property? C4-12

7) Removing the fish ladder should have been done decades ago, but in full flood mode, the water level is many feet above it; that is, it is but a minor impediment to floodwater. C4-13

a) Will these 'fish resting pools' consist of channel-spanning weirs or headwalls? Or will they be of the vertical slot type, creating pools for fish? C4-14

Overall, your plan is largely a waste of money. There are flood walls from Allen Park southeast. There are flood walls on Sylvan Lane (nw of Lagunitas Bridge), a concrete one at 27 SFDB and a newly-installed rip-rap floodwall at 25 SFDB. You should install new concrete channels in unit 4 on resident's property lines and north of Lagunitas Bridge to join these disparate entities. These need to be higher on the upstream side (at least 6.5 feet above BFE at my location), slightly lower in unit 3, and lower in unit 2. Doing that should mitigate the vast majority of flood events. C4-15

Regards,

Sterling Sam @ 415-215-9805
(fmr) Chief, Environmental Division
Department of Defense, Hawai'i, HI
Professor of Botany

2.5.4 Response to Letter C4: Sam Sterling

C4-1 The commenter asks if the County has reviewed past plans related to flood control and suggests incorporating ideas from past plans into the Draft EIR. The commenter also mentions a plan prepared by the Friends of Corte Madera Creek Watershed in 2017 and refers to a flaw in that plan.

The District reviewed past proposals for flood control in developing the Draft EIR for the proposed project. The Draft EIR was written following decades of USACE involvement in developing a flood control project for the area.

C4-2 This comment states that no compensation plan was proposed in the Draft EIR for property or home loss.

In accordance with CEQA, the Draft EIR evaluated the physical environmental effects of the proposed project. Economic effects (e.g., financial liability, property values) are not considered environmental impacts under CEQA, unless a physical impact on the environment would occur (see Master Response 5). The project has been designed to provide channel stability and avoid impacts on slope stability to protect residences adjacent to Corte Madera Creek.

C4-3 This comment summarizes project activities proposed to occur in Frederick Allen Park and expresses concerns about potential erosion issues with implementation of project activities.

As discussed in Chapter 2, Project Description, in the Draft EIR, the proposed project would include construction of retaining walls in Frederick Allen Park. The project-specific analysis of erosion (starting on page 3.9-49 in the Draft EIR) includes an evaluation of potential erosion impacts from the proposed project in Frederick Allen Park. Substantial hydrologic modeling has been undertaken as part of the project design and engineering process, and the proposed project would be implemented in accordance with best engineering practices to address channel stability. The District understands the need to protect residential properties and the tennis courts along the channel, and new retaining walls are proposed adjacent to the tennis courts, to transition the natural channel back to the concrete channel and protect channel stability as well as the multi-use path and tennis courts. See also Master Response 1 regarding staff recommendation to adopt Alternative 1, which does not involve activities in Frederick Allen Park.

C4-4 This comment asks how flood water is going to be directed to the concrete channel from the natural channel in Frederick Allen Park.

As discussed in Chapter 2, Project Description, in the Draft EIR, the proposed project would include retaining walls to connect the floodplain in Frederick Allen Park to the concrete channel, as shown in Figure 2.5-1 (see also response to comment C4-3). As discussed under Impact 3.9-2 beginning on page 3.9-50 in the Draft EIR, the proposed project would result in beneficial impacts and reduced flooding by keeping a larger

volume of flood waters in the concrete channel and out of the Ross Valley community. See also Master Response 1 regarding staff recommendation to adopt Alternative 1, which does not include the floodplain in Frederick Allen Park.

C4-5 This comment expresses concerns about a higher bank on the west side of Corte Madera Creek than on the east side at the parking lot and concerns that this grade differential would cause increased velocity in floodwaters entering Frederick Allen Park, and it suggests replacing the Post Office building.

Replacement of the Town of Ross Post Office is not part of the proposed project. The project design has included substantial hydraulic analysis to address the channel configuration. Refer to Section 3.9 of the Draft EIR and Master Response 3. Replacing the Post Office with a new building would not meet any project objectives and is therefore not considered as an alternative in the EIR.

C4-6 This comment states that implementing the proposed project would include removing many homes on both sides of the creek.

As discussed in Chapter 2, Project Description, in the Draft EIR, the proposed project would not include removing homes or the Post Office (see Section 2.5, Project Elements and Design, in the Draft EIR, for more information regarding the description of project elements and design).

C4-7 This comment asks whether the project hydrology consultants were in the field observing the 2005 storm event.

While the consultants who prepared hydrology section were not present during the New Year's 2005/2006 flood, the hydrology data from the 2005 storm event were used to calibrate the hydraulic modeling for the proposed project (see Section 3.9, Hydrology and Water Quality, starting from page 3.9-34, for more information regarding development of the hydraulic modeling for the proposed project).

C4-8 This comment asks whether staff from Stillwater Sciences conducted plant surveys in the creek corridor on July 15, 2020.

A supplemental tree survey was conducted by GHD on July 15, 2020. No other plant surveys were conducted on that date.

C4-9 This comment discusses non-natives trees that currently are on site and asks whether they would be replanted after tree removal.

The proposed project would involve planting native trees, as stated in Table 2.6-4 in Chapter 2, Project Description, in the Draft EIR. In addition, trees that would be planted as part of Mitigation Measure 3.3-2b would include native trees as replacement for the non-native trees removed.

C4-10 This comment asks whether the District has considered the possibility that large quantities of debris, sediment, and rock would cause reduction in flood conveyance.

The hydraulic analysis that forms the basis of design is based on the hydraulic model calibrated with observed high-water marks from various flood events in the area. The design of the floodwalls considered sediment effects on the channel hydraulics.

C4-11 This comment suggests implementing a program to raise residential structures above the 100-year floodplain.

This comment proposes a new program that would not be applicable for the proposed project. Raising residential structures above the 100-year floodplain would not achieve any of the project objectives. The cost to implement a program to raise residential structures above the 100-year floodplain and the logistics to implement such a program make it infeasible within the timeframe for the proposed project.

C4-12 This comment asks whether plans exist for property reassessment and property tax reduction for property losses caused by many floods.

This comment is unrelated to the proposed project and the Draft EIR (see also Master Response 5).

C4-13 This comment states that the fish ladder should have been removed decades ago and it is a minor impediment to floodwater.

As discussed in Section 3.9, Hydrology and Water Quality, in the Draft EIR, the existing Denil fish ladder is a primary flow constriction for the Unit 4 reach that causes extensive overbank flooding along Corte Madera Creek (on page 3.9-12 in the Draft EIR). As discussed in Chapter 5, Alternatives, in the Draft EIR, removing the Denil fish ladder would remove a constriction, increasing the amount of water that stays within the flood control channel below the fish ladder. The water surface elevation within the concrete channel below the fish ladder would increase because more water would stay within the flood control channel and would not be directed out of the bank after the fish ladder has been removed.

C4-14 This comment asks what type of fish resting pools would be constructed for the proposed project.

The design of the fish resting pools is discussed on page 2-23 in Chapter 2, Project Description, in the Draft EIR. The fish resting pools would be 1.5 to 3 feet deep and spaced approximately 150 feet apart in the channel. The downstream end of the pools would have a gradual transition to steadily accelerate flow out of them. The upstream end of the pools would be vertical, to help promote scouring and minimize sedimentation in the head of the pools (see Figure 2.5-7 on page 2-24 in the Draft EIR, which shows the proposed fish pools).

C4-15 This comment requests installation of new concrete channels in Unit 4 on residents' property lines.

The original USACE flood control project that was constructed in the 1970s included installation of concrete flood control channels in Unit 4. While that project was under construction, the Town of Ross challenged USACE and stopped the concrete channel construction at Unit 4. No support from the Town of Ross or the regulatory agencies has been given for extending the concrete channel into Unit 4, and any plans to extend the concrete channel are considered to be infeasible, based on the history of litigation over the concrete channel extension. Extension of the concrete channel into Unit 4 also would result in substantially greater environmental impacts than the proposed project and would not reduce any environmental effects of the proposed project.

From: Gilboy - Haven <cherilyng@prodigy.net>
Sent: Friday, February 26, 2021 1:41 PM
To: cortemaderacreek@marincounty.org
Subject: Flood Control plans - Granton Park

Comment Letter C5

Joanna Dixon and staff,

I cannot attend the March 2d meeting, thus my comments below.

RE: Pumphouse at end of Laurel Avenue:
I would appreciate receiving more information about the pumphouse.
- I am concerned that it may function when heavy storms, despite no flooding risk - how will this be handled? what triggers the pumps? C5-1
- The noise from the pumps are hopefully well insulated due to their proximity to residences. C5-2
- Planting of more Trees and other shrubbery is requested to buffer the close residences. Consider more new planting along right side of end of Laurel Ave. C5-3
- Can the fuel or motor or other topside parts be placed underground instead? to reduce size of cement pad. C5-4
- Can the vault and pumphouse be located further away from residences? Extend drainpipes as done in Hillside neighborhood. Other pumphouses seem to be located further away from houses by extending drainpipe, so an area closer to College Avenue would be more appropriate. C5-5
- Trees - Keep all trees not along cement fence - do not cut down trees between pumphouse and residences on Laurel Ave. C5-6

RE: The Swale & COM parking lot
- Will "The Swale" be fixed so that it functions as it did historically taking overflow into the 1st pond at end of Laurel Ave.? C5-7
- COM parking lot at Laurel Ave was to direct all surface water into drainpipes to overflow ponds, instead all surface water drains onto Laurel Avenue. Keeping surface water on their property was mandated when COM constructed Science Building in 2009. That issue has never been fixed by COM, please address to COM. C5-8

RE: Trees
- College of Marin had a nursery adjacent to creek and there are some very special mature trees that should Not be cut down. C5-9
- EIR does not sufficiently consider the substantial environmental effects of tree removal - pollution from saws, pollution from truck traffic, noise from saws/grinding/trucks hauling, and disruptive truck traffic through neighborhood. Also the loss of beneficial effects of trees, i.e. buffering noise and their healthful properties. C5-10
- Some trees that are tagged are on private property or property line - those trees and shruberry should not be cut down. There are 3-4 tagged trees around 1 Cedar and many more along the back of Granton Park properties that should not be removed. C5-11

If there is an on-site meeting involving the pumphouse and trees in the end of Laurel Ave area, please let me know. C5-12
Thank you,

-Cherilyn Gilboy
Owner (48 years), 1 Cedar Ave
P.O. Box 592, Kentfield CA 94914

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2.5.5 Response to Letter C5: Cherilyn Gilboy

C5-1 This comment asks how the stormwater pump station works, and the commenter expresses concerns that the pump station would run when no flooding risk exists.

Page 2-20 of the Draft EIR describes the stormwater pump station and backup power in detail. Additional information on the design of the stormwater pump station is presented next, for clarity about the pump station operation.

The pump station would include submerged stormwater pumps and a subsurface valve vault. The pumps have been designed to run only when needed because of a high-water level in the receiving channel (Corte Madera Creek), concurrent with a storm event. The wetwell design includes a bypass channel that would allow stormwater to bypass the wetwell when the water level in the creek is low enough for flow to exit into the channel. In this manner, water would bypass the pump station, and the pumps would not run when water elevations in the creek are below the elevation where water would back up into the Granton Park neighborhood. When the creek conditions keep water from exiting the system via gravity flow because of high creek water surface elevations, the bypass channel would overflow into the wetwell. When the wetwell level increases, the pumps would be activated and pump the stormwater into the outlet structure.

The size of the wetwell would influence the amount of time that the pumps run to lower the water level in the wetwell. Pumping to lower the water level in the wetwell to the shut off elevation should take less than 10 minutes, so that the pump would start and stop only up to 6 times per hour. The dimensions of the wetwell were selected so that the bypass channel could convey the design flow under gravity flow conditions when permitted by the water level at the outfall in the creek.

The pump station has been designed with 25-year storm capacity when the largest pump in the pump station is off and at the 100-year-storm maximum capacity.

C5-2 This comment expresses concerns about noise impacts resulting from the stormwater pumps during operation.

Discussion of noise impacts related to operation of the stormwater pump station is included on page 3.10-19 in Section 3.10, Noise, in the Draft EIR. The stormwater pumps would be installed underground and are not anticipated to create perceptible noise at the nearest residence. A generator would provide emergency backup power in the case of power failure when the stormwater pump station needs to operate. Operation of the backup generator would occur only during emergencies and during testing of the generator. Operation of the stormwater pumps and backup generator would be temporary and would not result in a permanent increase in noise.

C5-3 This comment requests planting more vegetation along the end of Laurel Avenue.

Refer to response to comment B1-16 regarding replanting of trees on site.

C5-4 This comment asks whether the top parts of the stormwater pump station could be placed underground.

As discussed on pages 3.1-26 and 3.1-27 of the Draft EIR, most of the pump station components would be installed underground, to minimize aesthetics impacts. An 80-square-foot concrete pad with a 150-kW backup power generator and a motor control center would be mounted aboveground, because aboveground access would be necessary for these components for control and maintenance purposes and these features cannot be located underground.

C5-5 This comment asks whether the stormwater pump station could be placed further away from residences.

The current pump station was sited and designed to balance the available space in the District's easement, align with the existing storm drain system and Corte Madera Creek pipe outfall, and minimize impacts on adjacent properties. The pump station facilities would be underground, with the exception of the pump control cabinet and backup generator. The backup generator would be idle most of time, except for annual maintenance and when the pump station does not have power from the electrical line and needs to operate. As discussed in the Draft EIR and responses to comments B1-15 and C5-2, neither construction nor operation of the stormwater pump station would result in significant impacts. Relocation of the pump station would not meet CEQA criteria for consideration as an alternative because it would not reduce or eliminate any significant impacts of the project.

C5-6 This comment requests not removing trees between the stormwater pump station and residences on Laurel Avenue.

Tree removal would be limited to the extent required for construction equipment access and to the extent required by USACE in the Section 408 permit. Several trees would remain on site in this area, and eight trees would need to be removed where below-grade elements would require tree removal to construct and operate the stormwater pump station (see Figure 2.6-3 on page 2-30 in the Draft EIR). As described on page 3.3-81 of the Draft EIR, under Mitigation Measure 3.3-2b: Tree Mitigation, the District shall replant trees as mitigation for removal of any native trees in the project area and any trees greater than or equal to 6 inches diameter at breast height located within the riparian corridor.

C5-7 This comment asks whether the swale would be fixed so that overflow would be directed into the first pond at the end of Laurel Ave.

The swale connecting Laurel Avenue and the basin on the College of Marin property would be modified to accommodate the pump station footprint. The swale would continue to function as a drainage path from Laurel Avenue to the basin. In addition, the

pump station also would collect surface runoff along Laurel Avenue and discharge the surface runoff to Corte Madera Creek.

C5-8 This comment states that the College of Marin parking lot at Laurel Avenue should direct surface water into drainpipes to overflow ponds. However, the surface water drains into Laurel Avenue. The comment requests that the District address this issue to the College of Marin.

This comment addresses the existing condition, not a project impact. The pump station is designed to intercept the overland flow on Laurel Avenue, as described in response to comment C5-7.

C5-9 This comment states that mature trees in the College of Marin nursery should not be cut down.

The College of Marin nursery is not within the project area, and the project would not remove trees from the nursery area.

C5-10 This comment states that the Draft EIR does not address the environmental effects related to tree removal adequately, including air pollution, noise, and transportation and traffic.

Impacts 3.2-2 and 3.2-3 and the mitigation measures in each in Section 3.2, Air Quality, in the Draft EIR address the fugitive dust and pollutants impact related to project construction. Impact 3.3-2 and Mitigation Measure 3.3-2b in Section 3.3, Biological Resources, in the Draft EIR address the impact of tree removal. Impact 3.10-1 and Mitigation Measure 3.10-1 in Section 3.10, Noise Draft, in the Draft EIR address the temporary noise impacts related to project construction. Impacts 3.13-1, 3.13-3, 3.13-4 and Mitigation Measure 3.13-1 in Section 3.13, Transportation and Circulation, in the Draft EIR address the temporary construction impacts related to pedestrian and bicycle traffic, traffic hazards, and emergency access. With the exception of the tree removal in Frederick Allen Park and temporary aesthetic impact from loss of tree canopy, the Draft EIR finds that the impact from tree removal would be less than significant with the mitigation included in the EIR. The Draft EIR concludes that the aesthetic impact in Frederick Allen Park would be significant and unavoidable for a period of approximately 10 years following landscaping.

C5-11 This comment states that some trees on private property or on private property lines are marked to be removed.

The tree removal analysis presented in the Draft EIR is very conservative and assumes a maximum level of tree removal based on USACE policy, which requires a 15-foot buffer between the floodwalls and trees. The trees that are indicated for removal are trees that are within 15 feet of the existing floodwall, where the proposed project would increase the height of the floodwall. During discussions with USACE about the proposed project,

USACE stated that trees on private property would not be removed, and that trees within 15 feet of the existing floodwall may not need to be removed, but the final determination would be provided in the Section 408 permit authorization.

C5-12 The commenter would like to be informed when an on-site meeting occurs to discuss the stormwater pump station and tree removal in the Laurel Avenue area.

No on-site meetings have been planned; however, if an on-site community meeting is planned in the future, the District would notify residents adjacent to the project area in advance of the meeting.

Website
Newsletter
Facebook
@Supervisorllice

Comment Letter C6

----- Forwarded Message -----
From: County of Marin Board of Supervisors <noreply@formresponse.com>
To: "propertymanagersllc@yahoo.com" <propertymanagersllc@yahoo.com>
Sent: Tuesday, March 2, 2021, 09:26:41 AM PST
Subject: We have received your Board of Supervisors Contact Form

Board of Supervisors Contact Form

Your Name:	Suzanne Mabardy
Your Email Address:	propertymanagersllc@yahoo.com
Subject:	Corte Madera Creek Project
Select a Routing Method (optional):	District
What District Do You Live In (optinal)?	District 2 - Katie Rice
Message:	I am the owner of 1135 Sir Francis Drake, Kentfield (immediately upstream from Kentfield Hospital Bridge, Kentfield side).This property is adjacent to the concrete channel and has NEVER FLOODED...thanks to good STRUCTURAL engineering. I have read the EIR and have these objections: 1) The project's primary objective is to improve flood management This objective is NOT met per the Hydrology Study (page 3.9-60. The study "shows either a reduction of flooding OR NO significant increas...," AND it shows increased flooding in areas around COM. This project simply does not adequately achieve it's primary purpose! 2) The Seismic Study only targets the channel wall in Ross/Fredrick Allan Park. Page 3.6.20 states, "The

C6-1

C6-2

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existing flood control channel wall is a concrete structure this a prone to damage under stone seismic events, whereas the proposed natural vegetated channel in FAPark would be less prone to damage or loss under a strong seismic event." This study totally ignores the full integrity of the entire concrete channel system. If there is such a seismic event, the entire channel would be "prone to damage"...NOT JUST IN ROSS.

C6-2 cont.

3) This project is heavily weighted as A BEAUTIFICATION PROJECT FOR THE TOWN OF ROSS PAID FOR BY MARIN COUNTY TAX PAYERS. If there is fear that ONY the Ross' concrete wall is failing...then let's get that justification. Otherwise, if you tear down the ROSS/ Park concrete channel AND beautify it...THEN it is logical that the entire concrete wall should be treated in the SAME method.

C6-3

Thank you for your attention to my comments.
Suzanne Mabardy 415-302-4383

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2.5.6 Response to Letter C6: Suzanne Mabardy

C6-1 This comment states that the proposed project would not meet its primary objective to improve flood management.

The proposed project has multiple objectives, including flood risk reduction, as stated in the Executive Summary and Chapter 2, Project Description, in the Draft EIR. The project would reduce flooding on residential, commercial, and municipal parcels in Ross, unincorporated Kentfield, and Larkspur as presented in Section 3.9 of the Draft EIR. The proposed project flood reduction benefits are discussed on page 3.9-60 in the Draft EIR. As discussed in Master Response 1, the District staff are recommending adoption of Alternative 1. Additional details about the Alternative 1 flood risk reduction benefits are presented in Master Response 3.

C6-2 This comment states that the seismic study targets the channel wall in Ross/Frederick Allen Park and ignores the full integrity of the entire concrete channel system.

This comment addresses the existing condition and not the impacts of the project. The Draft EIR includes a discussion of the analysis of the potential impacts of the proposed project, as required by CEQA. The proposed project would not remove the existing concrete channel in areas outside Frederick Allen Park. The comparison of existing conditions and proposed project conditions in the Draft EIR focuses on the area where the concrete channel would be removed. The concrete channel in all areas would be prone to potential impacts from strong seismic events because concrete is more at risk to damage from strong seismic shaking than natural earthen material and vegetation. The risk of seismicity to the existing concrete channel is the existing condition, and the vulnerability of the existing concrete channel to strong seismic shaking events would not change because of the project implementation in areas where the concrete channel would remain. A USACE will evaluate the risk of the taller floodwall on the structural stability of the concrete channel as part of the Section 408 authorization process and would not authorize modifications to the structure that would place the structure at risk. The proposed fish pool construction within the concrete channel has been evaluated by GHD as part of the 60% design process and the USACE will perform a risk evaluation as part of the Section 408 authorization process. The fish pools have been designed to avoid increased risk of damage to the concrete channel during strong seismic events.

C6-3 This comment states that the proposed project is a beautification project for the Town of Ross. The comment further states that if the concrete wall in the Town of Ross is removed, then the entire concrete wall in the project area should be removed as well.

The project objectives are identified in Section 2.4, Project Objective, in the Draft EIR. The project objectives do not include beautification but do include increasing environmental benefits and enhancing recreational experience. Improving environmental benefits and enhancing recreational experience could enhance aesthetic

appeal of the project area, including the project elements proposed within the Town of Ross.

Chapter 5, Alternatives, in the Draft EIR presents descriptions and evaluations of alternatives to the proposed project (beginning on page 5-1), including Alternative 1 that would involve no modifications to Frederick Allen Park (see Master Response 1 regarding the preference for Alternative 1). Other alternatives to the proposed project, including removal of the concrete channel in other areas, were considered in Chapter 5; however, the alternatives that would remove additional sections of the concrete channel would require substantially greater sources of funding than others available to implement the proposed project that would meet the criteria for economic feasibility. These alternatives also would involve actions in other areas and would not meet CEQA criteria for alternatives because they would not reduce any significant environmental impacts of the proposed project. Alternatives that would remove the concrete channel in other areas could be implemented as a separate project in the future, if landowner support exists for the alternative and new funding sources are available to implement the concrete channel removal.

Comment Letter C7

---------- Forwarded message ---------
From: **Andy Avins** <aavins@gmail.com>
Date: Fri, Mar 5, 2021 at 6:24 PM
Subject: Corte Madera Creek Flood Risk Management Project Input
To: <cortemaderacreek@marincounty.org>
CC: Miriam Kuppermann <miriam.kuppermann@ucsf.edu>

We are writing to express our strong support for the full range of the Corte Madera flood-mitigation efforts currently under consideration. As residents living on Kent Ave. in Kentfield, and having lived through the devastating flood of 2005, we are well aware of the potential for future flooding and its very serious consequences. We believe the advantages of proceeding with implementing all flood-control options far outweigh any negative consequences and we congratulate the Marin County Flood Control and Water Conservation District on their careful and thoughtful proposal. C7-1

We understand that proceeding with the most comprehensive flood-control options proposed would result in some temporary negative effects on the esthetics of Frederick Allen Park. However, we believe this is a relatively small price to pay for the benefits of the full project, given the increasing vulnerability of Ross Valley to future and worsening flooding as climate change continues. Furthermore, the effects on the Park's esthetics would be temporary (lasting a few years), resolving as newly planted trees mature, but the benefits of the project will last many decades. The overall environmental improvements also argue strongly in favor of proceeding with the full risk-reduction plan. C7-2

We thank the District for its hard work and we strongly voice our support for implementing the full range of flood risk-reduction options under consideration. C7-3

Sincerely,

Andrew Avins
Miriam Kuppermann
307 Kent Ave.
Kentfield, CA 94904
Email Disclaimer: https://www.marincounty.org/main/disclaimers

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2.5.7 Response to Letter C7: Andrew Avins and Miriam Kuppermann

C7-1 The commenters support the proposed project and believe that project benefits would outweigh any negative consequences.

This commenter's support for the proposed project is acknowledged.

C7-2 The commenters state that they understand the temporary negative aesthetics effects that would occur in Frederick Allen Park resulting from project implementation, but that this would be a small price to pay. The commenters express strong support for the proposed project.

The commenter's support for the proposed project is acknowledged. Refer to Master Response 1 for a discussion of the reasons for staff's recommendation to adopt Alternative 1.

C7-3 This comment expresses support for the proposed project.

The commenter's support for the proposed project is acknowledged.

Comment Letter C8

From: Hugh Barron <hughbarron@comcast.net>
Sent: Friday, March 12, 2021 11:46 AM
To: cortemaderacreek@marincounty.org
Subject: Ross Flood Control project - Comments

To whom it may concern:

I live at 43 Poplar Ave. in Ross, CA next to tennis courts and Allen Park. I spoke with Rich Simonich from Town of Ross this week who informed me on the trees' removal and replanting mapping for the Ross Flood Control Project. C8-1

I wanted to write to say that I'm in support of the project. My wife wrote to the mayor saying she's concerned about losing our privacy but it seems to me that our house at 43 Poplar will be in good shape based on the drawing showing our back fence trees staying and some bigger trees being added next to the path. C8-2

I'm thinking that access to a naturally flowing creek will create a very cool and natural space back there. Steelhead do actually run and then spawn up in Green Park below Phoenix lake, some years better than others. I'm kind of a fish conservation nut so think that removing the channel and fish ladder is a positive. C8-3 Also, it seems that if we don't lose privacy and the larger basin serves to mitigate flood risk then it's a good solution. C8-4

Best regards,

Hugh D. Barron

43 Poplar Avenue
Ross, CA 94957-1369
Cell: (415) 250-9919

Email Disclaimer: https://www.marincounty.org/main/disclaimers

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2.5.8 Response to Letter C8: Hugh D. Barron

C8-1 This comment states that the commenter has been informed about the proposed tree removal and planting plan related to the proposed project.

This commenter's knowledge of the tree removal and planting plan is acknowledged.

C8-2 This comment expresses support for the proposed project.

This commenter's support for the proposed project is acknowledged.

C8-3 This comment states that the commenter supports the project elements related to creating access to the creek, removing the concrete channel, and removing the fish ladder.

This comment addresses the merits of the project and not environmental impacts. Refer to Master Response 1 regarding the reasoning for staff recommendation to adopt Alternative 1.

C8-4 This comment states that the proposed project would be a good solution to mitigate flood risk if privacy is not lost.

This comment addresses the merits of the project and not environmental impacts. See Master Response 4 regarding privacy.

Comment Letter C9

John C. Crane

86 Sir Francis Drake Blvd., San Anselmo, CA 94960
415.847.5054 | john@johncranefilms.com | www.johncranefilms.com

March 15, 2021

Joanna Dixon
Associate Civil Engineer
Project Manager, Public Works
Marin County

RE: Corte Madera Creek Flood Risk Management Project Draft Environmental Impact Report (Draft EIR) Comments

Joanna:

Thank you for the opportunity to submit my comments for the Corte Madera Creek Flood Risk Management Project Draft Environmental Impact Report (Draft EIR).

I am in favor of Alternative 1: Reduced Footprint – Avoid Frederick Allen Park. C9-1

Frederick Allen Park is home to an urban forest that is currently flourishing and thriving, and it should be left alone. Moving forward with the proposed project will destroy the environment and disrupt the habitat for years - without significant flood benefit, and questionable objectives such as the Public Access and Recreational Quality which only provides marginal benefits, if any. In short, the proposed project is a waste of finite public resources. There are more pressing needs for DWR grant money in the State of California C9-2

Ripping out mature trees, displacing wildlife, removing the concrete channel, building flood walls, building a new park, and then waiting for at least 20 years for the trees to mature and replace the shade that now exists makes no sense whatsoever. The good news is that this can be entirely avoided by *not* giving Frederick Allen Park an *unnecessary makeover* and adopting Alternative 1: Reduced Footprint – Avoid Frederick Allen Park instead. C9-3

There are other concerns as well. At the March 2, 2021 Marin County Flood Control and Water Conservation District Board of Supervisors meeting, Raymond Wong made it clear that the hydrological modeling is still under development, and that the models need more complete analysis and verification. Once verified they will need to be provided to stakeholders and residents so they can evaluate and assess the true benefits of the EIR. Trying to pass a half-baked EIR is a sure-fire way to run into trouble, and the San Anselmo Flood Risk Reduction is proof that incomplete modeling, after the fact surveying, ignoring FEMA guidelines, inexplicable mitigation measures and ignoring common sense creates a nightmare of epic proportions. A mess that is still being dealt with, years after the EIR was passed. There is no reason to repeat this mistake. C9-4 C9-5

At the same meeting Katie Rice raised the question as to whether or the models "talk to each other or potentially not to each other." The fact that this question went unanswered by staff, should concern everyone interested in flood control. To move forward without a verified C9-6

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hydrological model, and one that works for the entire watershed, will only lead to disaster and result in unnecessary damage to the environment, homes and properties. It is not worth the risk. C9-6 cont.

Also, of concern, is that the Corte Madera Creek Flood Risk Management Project, Phase 1: Project Update presented on June 30, 2020 states that the "All construction tied to the DWR grant funds must be completed by December 31, 2022." This deadline has now become unrealistic, and it is pointless to continue to spend more money on high priced consultants. C9-7

Project Construction Schedule

Phase	Timeline
Construction Start	April 1, 2022
In-creek Construction Work	June 15 – October 15
Flood Wall (Segment #1) Construction	April 1 – July 7
Flood Wall (Segment #2) Construction	July 8 – August 25
Flood Wall (Segment #3) Construction	April 1 – July 14
Lower Channel Concrete Removal	June 8 – September 6
Fish Pool Construction	June 15 – October 11
Granton Park Storm Drain Pump Station Construction	April 1 – May 26
Channel Access Ramp Construction	April 1 – July 14
Frederick Allen Park Construction	June 1 – October 25
Fish Passage Transition Grading	June 15 – August 30
Construction End	October 25, 2022

All construction tied to the DWR grant funds must be completed by December 31, 2022.

The truth is that the genesis of the Frederick Allen Park makeover was to grab grant money. In other words, this is not a project that needed funding, it is funding that needed a project. C9-8

Thank you for the opportunity to provide my comments, which include my letter to you dated September 20, 2020, my letter to the Town of Ross dated March 10, 2021 who as the major stakeholder plays a vital role in this process. They are included below.

Thank you.

John Crane

Attachments: September 20, 2020 to Joanna Dixon, P.E. and March 10, 2021 to Mayor and Council Members, Town of Ross September 20, 2020

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Joanne Dixon. P.E.

RE: Corte Madera Creek Flood Risk Management Project Environmental Impact Report (Project) Scoping Meeting.

Thank you for the opportunity to provide comments on the scope of the Corte Madera Creek Flood Risk Management Project Draft EIR.

1. FISH LADDER REMOVAL ONLY PROVIDES MOST OF THE FLOOD BENEFIT

C9-9

Removal of the Fish Ladder provides most of the flood benefit to the Town of Ross and, by comparison, at a relatively modest price. The County must provide a Fish Ladder Only Alternative, and eliminate the redo for Frederick Allen park portion.

The Frederick Allen Park makeover provides very little flood benefit to Ross, yet it comes at a very high price. Despite the fact that it is largely comprised of a DPW grant, the County has not clarified the percentage of overall budget vs. flood risk reduction benefit, but it is clear it uses a disproportionate number of resources to achieve very little additional Flood Benefit.

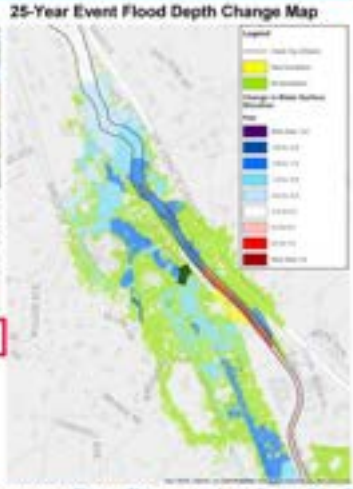
C9-10

Preliminary Floodplain Analysis (Work-in-Progress)
25-Year Event - Downtown Ross

25-Year Event Future Condition	Allen Park Action	Water Depth
No Project	No Action	12" to 14"
With Project*	Left Bank Improvement	8" to 10"
	Right Bank Improvement	6" to 8"
	Full Improvement	6" to 8"
	Fish Ladder Removal Only	6" to 8"

* Fish passage improvement is currently in concept design and will be added into the analysis.

25-Year Event Flood Depth Change Map



Corte Madera Creek Flood Risk Management Ross Presentation June 30, 2020

2. CUTTING DOWN 200 MATURE TREES IS A MISTAKE THAT ELIMINATES SHADE AND HARMS BIRDS, SQUIRRELS, FISH AND OTHER CREATURES INCLUDING HUMANS

C9-11

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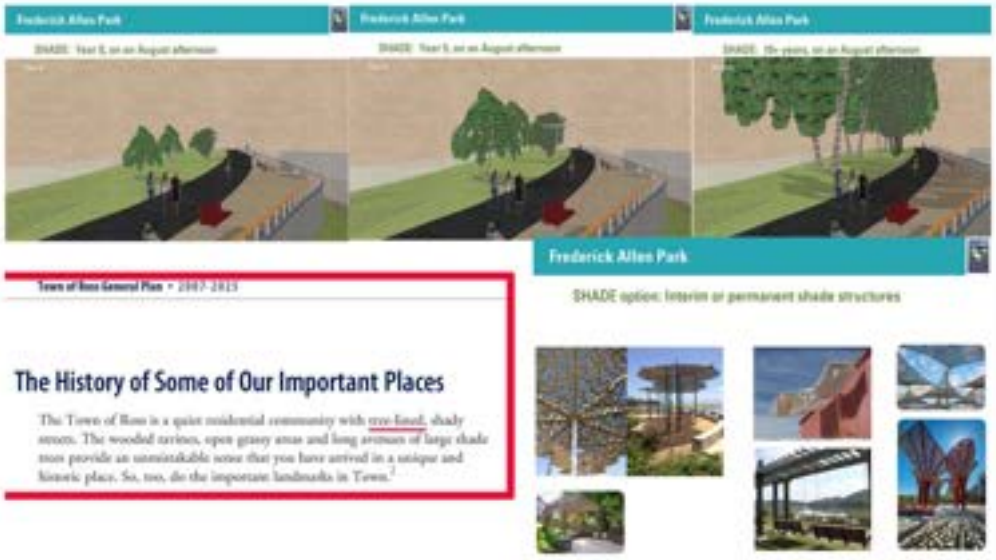
The proposed designs for Frederick Allen Park are out of step with the character and natural beauty of Ross. It is NOT environmentally sound to cut down 200 mature trees only to replace them with much smaller trees and manmade umbrellas to restore the shade that already exists. Especially when they need to be setback 15' from floodwalls.



C9-11 cont.

Corte Madera Creek Flood Risk Management Ross Presentation June 30, 2020

3. THE GENERAL FUND IS CURRENTLY FACING INCREASING OPERATING SHORTFALLS IN EACH OF THE NEXT FIVE YEARS

At a recent scoping meeting one of the Project Goals & Objectives presented was:

> **6. Fiscally Responsible.** Implement a flood risk reduction project that can be accomplished with local and grant funding and reasonably foreseeable grant funding opportunities.

C9-12

Now that we are in the middle of a huge financial crisis, as the link Marin County Staff Report for next Tuesday's BOS Meeting 9.22.20, begs the question: Why County is continuing to spend taxpayer money on nonessential projects as if there was no crisis? This is reckless and misguided – it is far from Fiscally Responsible.

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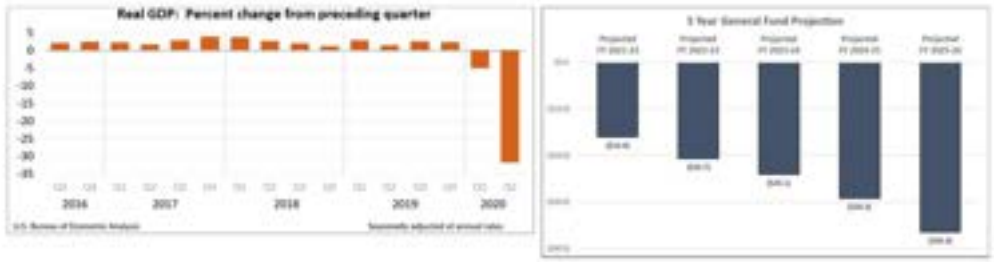

"...there are several uncertainties that can substantially impact budget projections."

Marin County Board of Supervisors SUBJECT: First Quarter Budget Update 9.22.20

Marin County Board of Supervisors SUBJECT: First Quarter Budget Update 9.22.20

C9-12 cont.

4. ALT J DIVERTED WATER FROM UNIT 4, BUT NOW THERE IS NO FLOOD PLAN FOR UNIT 4 AT ALL

Susanne Heim of Panorama Environmental, Inc. stated that the new EIR was basically the USACE's Alt. J from the previous Corte Madera Creek Project EIR - except with no bypass tunnel. The Bypass Tunnel was designed to divert significant cfs, but now there is no plan and the water will simply continue to flood homes in this section.

C9-13

Instead of engineering new solutions, Unit 4 from Sir Francis Drake Bridge to the Fish Ladder has no flood protection, and has been excluded from this project entirely. It is also excluded from the San Anselmo Flood Risk Reduction Project and has become a "no mans" land for flood protection. This is denial, and it is not a solution. And it cannot be overlooked.

5. FLOOD WALLS NEED PUMPS TO REMOVE OVERLAND WATER FROM BEHIND THE WALLS

The floodwalls being proposed are designed to prevent to flooding from the creek, there are no plans to remove the water that will be trapped behind them from overland flow. There is no plan to for pumps or other methods to remove the overland water that will be trapped behind them. This will create new problems for homeowners.

C9-14

IN SUMMARY

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It is time to hit the reset button. We need a project that works from the bottom up instead of the other way around. I put the County on notice that homeowners, such as myself, need the County to provide flood controls that protect residents – not harm them. The County needs to adhere to its goal and promise to: *"implement mitigation measures to reduce or avoid the possibility of increasing downstream flooding."*

That is the standard that the County set for itself, and they should be held accountable and responsible for mitigation measures that actually achieve that.
The goal is to solve existing problems, not create new ones.

C9-15

Thank you for your consideration.

John Crane

March 10, 2021

Dear Mayor and Council Members, Town of Ross:

RE: Corte Madera Creek Flood Risk Management Project Draft Environmental Impact Report (Draft EIR) Comment Letter

Don't assume the County is using current hydrological models.

As the March 15th, 2021 comment letter states, the Town of Ross, as a major stakeholder in the Project, and a responsible partner is now in a position to demand that County's ensure that information and analysis in the Draft EIR is accurate and reliable so it can evaluate potential impacts that are likely to occur within the Town. The Town Council of Ross should demand that the County demonstrate that they have a viable hydrological model that actually works, and one that has outcomes or outputs that can be trusted. We're not there yet.

To that end, I believe that the letter should also specify a requirement for up-to-date hydrological models that are consistent with the upstream projects that will actually be implemented. In my opinion, the Town of Ross should not only add this to the March 15, 2021 comment letter, but require this information be provided upfront - *before* the Final EIR is certified – not *after* the fact. This is common sense.

With all the recent and significant developments and changes to projects, the need for accurate up-to-date modeling has become increasingly important. Especially since there can be no doubt that some of the current information in Draft EIR is no longer accurate or valid due to recent changes for upstream projects. Minor changes are one thing, but major changes need to be carefully studied.

C9-16

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In the Draft EIR, Table 3.9-5 lists Projects Included in Future Condition Scenarios. Currently there are nine projects listed, but given recent developments are they all going to move forward? It is also clear that, in addition, many projects are still being developed and/or undergoing modeling and design modifications, making it even more challenging and even harder to evaluate their impact downstream. On page 3.9-38 under Impact Analysis Methods, it is made clear the future upstream projects will affect the baseline hydraulic conditions of Corte Madera Creek, and that an analysis would be misleading if it does not include information for upstream projects that have been planned or approved.

C9-17

The importance of having current information cannot be overlooked, because the accuracy of the hydrological modeling is critical to the success for this project and all flood projects in the County. And needless to say, changes to velocities and water surface elevations need to be accurately modeled and fully considered. And the projects are linked together so whatever happens downstream impacts upstream, and vice versa.

C9-18

Do the models "talk to each other?"

At the March 2, 2021 Marin County Flood Control and Water Conservation District Board of Supervisors meeting, Supervisor Katie Rice asked a question that goes to the heart of **one of the biggest problems** facing this project and other watershed projects by asking the following:

> KATIE RICE: …WITH REGARDS TO THE MODELING THAT WAS USED IN THE ANALYSIS FOR THIS PROJECT VERSUS THE MODELS OR MODELING THAT WAS USED FOR PROJECTS UPSTREAM, AND HOW DO THOSE TALK TO EACH OTHER OR POTENTIALLY NOT TO EACH OTHER?

Katie Rice hit the nail on the head. And she showed leadership by asking a tough direct question of her staff. And Liz Lewis gave a response that did not directly answer the question or inspire confidence:

C9-19

> LIZ LEWIS: …WE USED THE SAME MODEL THAT WAS USED WITH SOME REFINEMENTS, SO RAYMOND, DO YOU WANT TO TOUCH UPON THE REFINEMENTS FOR THIS PROJECT?

When Raymond responded, he revealed some important information that shed light on the process that the County is using. And in doing so he left no doubt that that the "base of the model" is based on the 2017 model developed by USACE. That in his view there is a combination of "two models has been linked together" and that it "the objective is to make sure the model we running here is synchronized with the upstream model."

And Raymond made it clear that this model is a work-in-progress, and it is far from "refined" as "the project team is working of the 35% and continue to update with the new design information." It appears that one model doesn't exist or is still in preliminary stages, and the

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other – the upstream models are still evolving undergoing recalibration and design modification. This is not very reassuring and it is a big problem because the goal of using *one model* has been stated clearly: *"to ensure consistency in the hydraulic analyses and CEQA documents across all flood projects."*

I hope the Town Council will review the Full Transcript attached below and/or use this link to view this portion of the March 2, 2021 video: https://vimeo.com/521090660. It is a telling exchange that will make you question if County has valid outcomes to use from the model(s), and whether or not the model(s), in fact, do not talk to one another. Keep in mind that the SAFRR EIR was passed in 2018, and the modeling is not settled in 2021. At least not yet.

C9-19 cont.

Actual Number of Homes Being Put at Greater Flood Risk.

The distance between Winship Bridge to Lagunitas Bridge is approximately one-half mile. And yet in this extremely vulnerable area virtually nothing will be done to protect property owners in Unit 4 which begins at Sir Francis Drake Bridge with the Corte Madera Creek Flood Risk Reduction Management Project.

Between Winship Bridge and Sir Francis Drake Bridge there are 12 homes that are part of the San Anselmo Flood Risk Reduction Project (SAFRR). Although SAFRR "artificially" ends at Sir Francis Drake Bridge, the water keeps flowing downstream.

There are, I believe, another 32 homes between Sir Francis Drake Bridge and Lagunitas Bridge including 5 that are repetitive loss properties according to Richard Simonitch. That's a lot of homes – many of which will be put at increased risk - and that is in just one one-half mile of the proposed project.

C9-20

The Town of Ross should demand that these homes be surveyed.

The homes above should be surveyed, and so should the homes on Sylvan Lane, Shady Lane, Bolinas Ave., etc. because some will also be impacted by flooding. Removal of Bridge Building 2 abutments adds 4" *inside* the channel and 4" *outside* the channel. Hugh Davis has told me and my neighbors between Winship Bridge and Sir Francis Drake Bridge that we are *more likely* to be flooded from the street *than the creek* due to SAFRR. And that water will *continue* to flow down the streets – it doesn't stop where the SAFRR project *artificially* ends.

And as the Town of Ross knows, there are additional homes downstream of Lagunitas Bridge. 10 more in Ross to the end of Frederick Allen Park and countless more in Kentfield.

C9-21

Ross Should Demand That The Board of Supervisors Tour the Project Site

C9-22

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If we could use a boat it would be wise to give the Board of Supervisors a real-world tour and look at *all* the various sections of the Projects, potentially impacted homes, and then take a walk in the park – for those Supervisors who have never even been to Frederick Allen Park.

The Town of Ross should insist in its comment letter that the Board of Supervisors garner a first-hand understanding of the various elements before they certify the project. They should see the trees that will be cut down, the shade that will be gone, the animals that will be displaced, the complexity of removing the concrete channel and the privacy that homeowners currently enjoy that will be removed – along with the inability to plant new trees within 15' of flood barriers.

C9-22 cont.

What is the Benefit of the Frederick Allen Park Makeover? Recreationally or otherwise?

I would like to point out that the proposed park does not significantly add more recreational use. On any given day in Frederick Allen Park now - there are bikers, dog walkers, families with kids. Any increase in recreational use is likely to be marginal, and it comes with an enormous price tag to the environment, wildlife, along with a huge disruption for current use for the entire community – for years to come.

C9-23

Even the layout of the path would not change significantly - maybe a curve or two. The big changes are removing the chain link fence to "providing access to the creek, which does not currently exist" creating a potential safety hazard, and removing a huge number of mature trees and replanting trees that will take 20 years to provide the shade that currently exists.

Significantly, giving Frederick Allen Park a *makeover* adds no additional flood protection benefit. It offers the same benefit as Alternative 1: Reduced Footprint – Avoid Frederick Allen Park, but it comes at an exorbitant cost.

Years and years of disruption.

In the Draft EIR it says the proposed park will take 7 months to construct. But how many years will it actually take to rip out all the trees, displace wildlife, build a new park, and remove the channel? You can bet that the disruption will take years and years – not months.

C9-24

The County constantly says it "will get to it" when it doesn't have answers, but I hope the Town of Ross will not buy this excuse when it comes to protecting the Town and its residents. That is why I hope the Town Council will take a "buyer beware" approach, and finally hold the County to a higher standard that includes a viable plan with verified, reliable hydrological models.

C9-25

Recent events have made it clear that County doesn't follow FEMA guidelines, or their own inexplicable mitigation criteria, or Marin County ordinances or provide accurate, clear, and verified hydrological models that adhere to their stated goal of consistency. The County has shown a disregard for the process, following their own policies, and/or respecting the properties for the Town and its residents. The Town Council of Ross should demand better.

C9-26

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Thank you for your consideration.

John Crane

Attachment: March 2, 2021 Marin County Flood Control and Water Conservation District Board of Supervisors meeting Transcript

March 2, 2021 Marin County Flood Control and Water Conservation District Board of Supervisors meeting | Transcript From Captions

KATIE RICE: AND THE LAST QUESTION, AND THIS WAS RAISED BY SOME OF OUR COMMENTERS VIA EMAIL WAS WITH REGARDS TO THE MODELING THAT WAS USED IN THE ANALYSIS FOR THIS PROJECT VERSUS THE MODELS OR MODELING THAT WAS USED FOR PROJECTS UPSTREAM, AND HOW DO THOSE TALK TO EACH OTHER OR POTENTIALLY NOT TO EACH OTHER?

SUZANNE HEIM: YEAH, LIZ DO WANT TO ANSWER THAT QUESTION OR MAYBE RAYMOND?

LIZ LEWIS: YEAH, RAYMOND DO YOU TO SPEAK TO – WE USED THE SAME MODEL THAT WAS USED WITH SOME REFINEMENTS, SO RAYMOND, DO YOU WANT TO TOUCH UPON THE REFINEMENTS FOR THIS PROJECT?

RAYMOND WONG: SURE, YES. CAN EVERYONE BE ABLE TO HEAR ME? SO GOOD AFTERNOON. THIS IS RAYMOND. SO THE MODEL THAT IS USED FOR THIS – TO USE FOR THIS PROJECT IS BASED ON THE U.S. ARMY CORP ENGINEER MODEL THAT WAS DEVELOPED, CORPS OF ENGINEER IN 2017. SO THE BASE OF THE MODEL IS IDENTICAL TO START – TO BUILD FOR THE PROJECT AND ALSO FOR THIS PROJECT. FOR THIS MODEL, IT DOES INCLUDE ALL THE IMPROVEMENT, THE PROPOSED IMPROVEMENTS UPSTREAM ON THE SAFRR PROJECT, AND THEN IN COMBINATION WITH THIS PROJECT. THIS TWO MODEL HAS BEEN LINKED TOGETHER AND REFLECTING THE EFFECT FROM THE RESPECT PROJECT. THIS ANALYSIS IS BASED ON THE CONCEPT DESIGN RIGHT NOW THE PROJECT TEAM IS WORKING OF THE 35% AND CONTINUE TO UPDATE WITH THE NEW DESIGN INFORMATION COME IN FOR THE UPSTREAM PROJECT TO INCORPORATE.

THE OBJECTIVE IS TO MAKE SURE THE MODEL WE ARE RUNNING HERE IS SYNCHRONIZED WITH THE UPSTREAM MODEL, AND SO IN THE END OF THE DAY IT WILL BE A COMBINED WATERSHED MODEL REFLECTING THE EFFECT OF BOTH THIS PROJECT AND ALSO THE UPSTREAM PROJECT.

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(Here is the link to this portion of the March 2, 2021 video: https://vimeo.com/521090660)

2.5.9 Response to Letter C9: John C. Crane

C9-1 The comment states support for Alternative 1.

Support for Alternative 1 is acknowledged. See Master Response 1 regarding staff recommendation to adopt Alternative 1.

C9-2 This comment states that Frederick Allen Park is an urban forest, and the proposed project would create only marginal recreational benefits, would disrupt the habitat for years, and would be a waste of DWR grant funding.

As discussed in Section 3.3, Biological Resources, in the Draft EIR, the areas in Frederick Allen Park are mapped as landscaped vegetation with a mix of native and nonnative plants and trees (on page 3.3-14). Frederick Allen Park does not contain native habitat; it is a landscaped park. Existing landscaping in the park is not connected to the creek because of the floodwall, and the existing trees and vegetation in the park do not provide shading of the creek or riparian vegetation for fish and wildlife. The proposed project would create natural riparian habitat in the park by restoring the earthen channel and planting native riparian vegetation in the floodplain, which would provide a connected creek and floodplain habitat. See Master Response 6 for additional information regarding the existing conditions and proposed improvements in Frederick Allen Park.

The District received matching grant funds from DWR to support project construction. DWR chose to fund the proposed project because of project benefits to aquatic resources, including flood risk reduction and habitat improvement. The proposed project would provide broad benefits to both flood risk reduction and habitat improvement, consistent with the grant terms. These benefits are discussed in the Executive Summary, Chapter 3.3, Biological Resources, and Chapter 3.9, Hydrology and Water Resources, in the Draft EIR.

C9-3 This comment states that project construction would result in impacts on mature trees, wildlife, and shade in Frederick Allen Park, and that these impacts would be avoided with implementation of Alternative 1.

The commenter's support for Alternative 1 is acknowledged. Project construction impacts in Frederick Allen Park are addressed in the Draft EIR. The impacts that are discussed in the comment would be temporary, and the proposed project would

enhance habitat conditions, as discussed in response to comment C9-2. See also Master Response 1.

C9-4 This comment expresses concerns regarding the hydraulic modeling that still is being developed and would need verification.

Refer to Master Response 3 regarding the design process and additional details on hydraulic modeling for Alternative 1, based on a 60% level of design. The hydraulic modeling used for the proposed project was developed in USACE HEC-RAS v5.0 modeling software, refer to page 3.9-34 of the Draft EIR for a detailed discussion of hydraulic modeling used for the proposed project. The HEC-RAS software is a standard and broadly accepted tool for the kind of modeling and analysis that were performed to inform the project's design and environmental impacts analysis.

C9-5 This comment compares the proposed project to the San Anselmo Flood Risk Reduction Project.

The proposed project would be separate from the San Anselmo Flood Risk Reduction Project. This comment does not address the adequacy or accuracy of the Draft EIR. Refer to Master Response 3 regarding the design and modeling process. The Draft EIR addresses FEMA guidelines and acknowledges the need for a conditional letter of map revision (CLOMR) as listed in Table 2.8-1 of the Draft EIR. The FEMA approval process is separate from CEQA. It would be conducted for the proposed project after the CEQA process has been completed.

C9-6 This comment states that the question raised by Supervisor Katie Rice about the hydraulic modeling was not answered by staff during the public hearing on March 2, 2021. The comment further states that without a verified hydraulic model that works for the entire watershed, the proposed project will result in necessary damage to the environment.

The question raised by Supervisor Katie Rice during the public hearing was answered by Raymond Wong, the hydrology consultant to the District. As explained in Section 3.9, Hydrology and Water Quality, in the Draft EIR, the hydraulic model considers the upstream projects, including the San Anselmo Flood Risk Reduction Project, and the proposed project in the future condition scenario modeling. See page 3.9-35 of the Draft EIR for more information regarding development of the hydraulic model and cumulative projects that were considered in the future condition analysis.

C9-7 This comment expresses concerns about meeting the schedule for project construction in 2022.

The District is continuing to work with the project stakeholders to meet the schedule. The construction schedule is shown in Table 2.6-5 on page 2-38 in the Draft EIR. After publication of the Draft EIR, a public workshop was held in Ross, and the proposed

project was discussed at a Town Council meeting in May. Based on the results of the Council meeting, the District staff are recommending adoption of Alternative 1 rather than the proposed project, to meet the 2022 construction schedule. See Master Response 1 for further details.

C9-8 This comment states that the purpose of the project element in Frederick Allen Park is to obtain grant funding.

The mission of the District is to reduce the risk of flooding for the protection of life and property while using sustainable practices. The District does not seek grant funding for projects that are not needed. The District seeks grant funding for projects that are compatible with its mission. See Master Response 1.

C9-9 This comment proposes an alternative that is reflected as Alternative 1 in the Draft EIR.

See Chapter 5, Alternatives, in the Draft EIR for more details about Alternative 1: Reduced Footprint-Avoid Frederick Allen Park. Also see Master Response 1 and Master Response 3.

C9-10 This comment states that the project element in Frederick Allen Park provides very little flood benefit to the Town of Ross.

The Fish Ladder Removal Alternative is one of the alternatives considered but rejected for further analysis because this alternative would not meet most project objectives and would not be technically feasible. Removal of the fish ladder in the absence of other hydrologic modifications would create hydrologic instability in Corte Madera Creek and could cause scour at the transition to the concrete channel, as discussed in Chapter 5 of the Draft EIR. The Fish Ladder Removal Alternative would result in significant hydrologic impacts because it would not provide protection for Kentfield, leading to increased flooding in Units 3 and 2. The flood benefits of the Frederick Allen Park project element, as compared to Alternative 1 that would avoid modification to Frederick Allen Park, are discussed in Chapter 5, Alternatives, in the Draft EIR. As discussed on page 5-26 in the Draft EIR, Alternative 1 would have less flood reduction benefits and would result in increased water surface elevation compared to the proposed project during a 100-year storm event. See Chapter 5 in the Draft EIR for more detailed information regarding the flood benefits of the Frederick Allen Park project element. See Master Response 1.

C9-11 This comment states that the project would remove 200 mature trees in Frederick Allen Park and result in impacts on wildlife and humans.

USACE could require removal of any trees located within 15 feet of the existing floodwall based on USACE policy regardless of the project implementation. The proposed project would remove up to 144 trees in the Frederick Allen Park reach of the Corte Madera Creek channel. This analysis reflects the worst-case scenario where

USACE would require at 15-foot vegetation setback. Approximately 113 trees would be removed if a setback is not required (refer to Table 2.6-2 of the Draft EIR). The urban/developed area in Frederik Allen Park currently is separated from the creek by a 10-foot-tall concrete wall and does not provide riparian habitat. See Master Response 6 regarding the habitat benefits of the proposed project.

C9-12 This comment states that the proposed project would not meet the objective of being fiscally responsible because we currently are in the midst of financial crisis and the project is not essential.

The proposed project would be funded by existing funding that is available for flood control, and it would be funded with matching grant funds from the California Department of Water Resources, if the project can be constructed by the end of 2022. Flood control projects are considered to be essential services because they provide essential protections for public safety, water quality, fisheries, and wildlife habitats. If the District does not implement the proposed project by the end of 2022, the District will not be able to meet the grant funding deadline, and the matching DWR funding no longer will be available for project implementation. Chapter 5, Alternatives, in the Draft EIR includes an analysis of the No Project Alternative, which represents the expected future conditions if no change would occur in the current channel conditions.

C9-13 This comment states that no flood plan is proposed for Unit 4 because the project would not include a bypass tunnel, and no flood protection would be provided by the proposed project or the San Anselmo Flood Risk Reduction Project.

The project would include regrading in Unit 4 above the fish ladder, to lower the channel bed and create a smooth transition to Unit 3. The project also would install streambank stabilization elements, including planted rock, vegetated soil lifts, erosion-control fabric, and engineered streambed material in Unit 4. The project elements proposed in Unit 4 are shown in Figure 2.5-1 on page 2-9 in the Draft EIR. Flooding from creek overtopping would be reduced in Unit 4 because of the proposed project, as shown in Figure 3.9-7 to Figure 3.9-9 on pages 3.9-55 to 3.9-57 in the Draft EIR, and in the graphics provided in Appendix E.

Chapter 5, Alternatives, in the Draft EIR includes discussions of the alternatives proposed for the area upstream from the fish ladder and Lagunitas Bridge. However, these alternatives would not meet the feasibility criteria for the proposed project because they would require acquisition of properties by the District, which would be cost prohibitive. See Table 5.2-1 on page 5.7 in the Draft EIR for more information regarding the alternatives considered during project planning and preparation of the Draft EIR. The proposed project would not preclude future flood control projects in Unit 4 or upstream, but additional flood control actions upstream would not be possible within the constraints of the available funding and timeline of the proposed project.

C9-14 This comment states that the floodwalls would need pumps to remove the overland water behind them, and the proposed project would create flooding behind the floodwalls.

As described in Draft EIR Chapter 2, Project Description, the primary function of the proposed floodwalls in Units 2 and 3 would be to minimize the extent that the creek flow overtops the creek channel and inundates the floodplain. New storm drain inlets with backflow preventers are proposed along the new floodwall segments, to drain surface runoff from behind the floodwall into the creek. At the Granton Park pump station, a new storm drain inlet also would be installed, to capture runoff behind the floodwall.

C9-15 This comment states that the County should provide flood project controls that protect residents, not to harm them, and implement mitigation measures to reduce or avoid the possibility of increasing downstream flooding.

The proposed project has been designed to reduce Corte Madera Creek flooding of residential and commercial areas. As discussed in Section 3.9, Hydrology and Water Quality, in the Draft EIR, the proposed project would reduce flooding in the Town of Ross and unincorporated Kentfield (see the discussion beginning from page 3.9-54 and the summary of impacts on page 3.9-60 in the Draft EIR). The areas where flooding would increase would be limited to parking lots, playgrounds, and an elevated trailer near College Avenue (with no permanent structures affected), and no significant increase in flooding would occur on residential properties. The model projected increase in water surface elevation of 0.02 to 0.2 feet in the area east of Unit 2 and south of Stadium Way is within the range of model uncertainty, and thus the impact would be less than significant. Model precision and the significance threshold for change in water surface elevation are discussed on page 3.9-35 and page 3.9-39 in the Draft EIR. Because no significant increase in water surface elevation would occur at any structures, no mitigation is proposed. See Master Response 3 regarding the potential need to prepare a Supplemental EIR if the proposed project is shown to cause new significant impacts on flooding in subsequent design revisions. The proposed project would not cause a significant increase in flood risk at any structures. In addition, after the proposed project is approved, the District would need to obtain FEMA's Conditional Letter of Map Revision for changes in the water surface elevation in the regulatory floodway (concrete channel).

C9-16 The comment assumes that the hydraulic model used for the proposed project is not up-to-date and suggests that the Town of Ross request information about the hydraulic model before certification of the Final EIR. The comment also states that the information in the Draft EIR no longer is accurate or valid because of recent changes for upstream projects.

The hydraulic model used for the proposed project is up-to-date. See page 3.9-34 in the Draft EIR for information regarding the hydraulic modeling used for the proposed project. The hydraulic model incorporates the planned and/or approved upstream projects in the future condition analysis. See Table 3.9-5 on page 3.9-36 in the Draft EIR for a list of projects that were considered in the future condition analysis, and see the Impact Analysis Methods on page 3.9-38 in the Draft EIR for details regarding the approach for the future condition analysis.

The Town of Ross hired an independent consultant (Schaaf & Wheeler) to verity the hydraulic modeling. The consultant concluded that the hydraulic model for the proposed project is a complex, robust model that appears reasonable. See response to comment C9-4 for information regarding the modeling and design process.

C9-17 This comment states that many projects included in the hydraulic modeling are still under development or planning phases, which makes it difficult to evaluate their impacts downstream.

The intent of the future condition scenarios is to estimate the projected flood inundation in the project area, with consideration of projects that are planned to be implemented in the future, and with a combination of the projected sea-level rise. The input for the future condition analysis is based on the best available planning and design information currently available. After Board of Supervisor approval of the proposed project or an alternative in the future, more detailed engineering and design would be completed and additional hydraulic analysis would be prepared as part of that detailed engineering and design process. The detailed engineering and design would continue to consider the upstream projects that are proposed or being implemented. See Master Response 3 for additional details on the process.

C9-18 This comment states that current information is important for hydraulic modeling and changes need to be accurately incorporated into the modeling because upstream projects and the proposed project would be linked together.

Three scenarios are analyzed in the Draft EIR: 1) existing conditions, 2) future conditions with upstream projects and moderate sea-level rise, and 3) future conditions with upstream projects and increased sea-level rise. In all scenarios, the proposed project would produce flood reduction benefits and would not cause increased flooding at any structure. Because the District has considered a range of scenarios with different baseline conditions and the results have been consistent regarding the creation of flood reduction benefits and lack of increased flooding on residential properties, the model results are not sensitive to the upstream projects or sea-level rise. See Section 3.9, Hydrology and Water Quality, in the Draft EIR, starting from page 3.9-35 for more information regarding the scenarios considered in the hydraulic modeling, and starting from page 3.9-54 for the discussion of project impacts by conditions and area. See also Master Response 3 regarding updated hydraulic modeling for the 60% design.

C9-19 This comment includes a section of the transcript from the public hearing on March 2, regarding the question about how the hydraulic modeling for the proposed project and upstream projects are linked together. The comment questions the validity of the hydraulic modeling outcomes.

The hydraulic model used for the proposed project is consistent with the model used for the upstream projects. Both models are built on the same underlying hydraulic model that was developed and calibrated by USACE and Stetson Engineers, Inc. As the project design is refined through the design and engineering process, hydraulic modeling is updated at each iterative level of engineering and design. See Section 3.9, Hydrology and Water Quality, from page 3.9-35 in the Draft EIR for more information regarding how the hydraulic was developed and refined. Also see Master Response 3 for more information regarding the modeling and design refinement process.

C9-20 This comment states that many homes in Unit 4 would be put at increased flood risk from the San Anselmo Flood Risk Reduction Project.

Figure 3.9-7 to Figure 3.9-9 on pages 3.9-55 to 3.9-57 in the Draft EIR show that the proposed project would result in reduced water surface elevation and associated flood risk reduction benefits at residential areas along Sylvan Lane in Unit 4. No increased flood risk would occur upstream from Lagunitas Road Bridge because of the proposed project. The San Anselmo Flood Risk Reduction Project along with the proposed project, and other bridge replacement and development projects in the watershed would reduce the frequency and severity of flooding in the watershed resulting in a cumulatively beneficial impact. Although the proposed project would not include flood risk reduction elements in the area upstream from Lagunitas Road Bridge, the proposed project would not preclude future flood risk reduction projects in the area, if funding is available and community support exists for flood control. See Master Response 1 regarding lack of community support for the portion of the proposed project in Frederick Allen Park.

C9-21 This comment suggests that the Town of Ross should demand that the District survey homes in Unit 4 along Sylvan Lane, Shady Lane, and Bolinas Avenue because some homes would be affected by flooding.

As discussed under Impact 3.9-5 on page 3.9-54 in the Draft EIR, the proposed project would not result in increased water surface elevations in areas along Sylvan Lane, Shady Lane, and Bolinas Avenue. The proposed project either would have no effect or would result in reduced water surface elevations at properties above Lagunitas Bridge along Sylvan Lane, Shady Lane, and Bolinas Avenue. The Town of Ross could survey every property in the town, but this would be cost and time prohibitive for the District to do. Surveying the elevation of the finished floor for all properties in this area would add no value to the evaluation of the project impacts because no adverse effect has been identified in the area, regardless of the structure elevation.

C9-22 This comment suggests that the Town of Ross should demand that the Board of Supervisors tour the project site with a boat. The comment also suggests that the Board of Supervisors should view the trees that are proposed to be removed, so that the Board understands the potential impacts that would be caused by tree removal.

The concrete channel has minimal flow for the majority of the year. When substantial water exists in the creek, it is fast moving, and it is not safe to tour the area by boat. The flood control channel was designed for flood control rather than for navigation. Chapter 2, Project Description, in the Draft EIR discusses the approach to replace trees that would be removed with riparian trees and shrubs. The current tree canopy does not support an understory. The proposed project would restore natural vegetation in the area, which would support increased biological diversity of plants and wildlife. See Section 2.6.9 on page 2-36 in the Draft EIR regarding the approach to replace removed trees. Also see Mitigation Measure 3.3-2b on page 3.3-81 in the Draft EIR for specifics on tree replacement.

The impacts of tree removal on views also are addressed in the Draft EIR. See the analysis of aesthetic impacts and visual simulations, shown in Figures 3.1-11 through 3.1-21 on pages 3.1-30 through 3.1-32 in the Draft EIR, concerning the conditions immediately after project implementation as well as approximately 10 and 20 years after landscaping. Also see Master Response 1 regarding Alternative 1.

C9-23 This comment asks what the benefits would be for the project elements in Frederick Allen Park. The comment states that the project elements in Frederick Allen Park would not change the recreational use of the park but would create potential safety hazard because of the removal of the chain-link fence. The commenter states that Alternative 1 would offer the same flood protection benefits as the proposed project.

The project elements in Frederick Allen Park would improve biodiversity, by creating riparian habitat and improving water quality, which would be supported by the regulatory agencies, including the San Francisco Bay Regional Water Quality Control Board, National Marine Fisheries Service, and California Department of Fish and Wildlife. The project elements in Frederick Allen Park would also meet the project objective to improve environmental benefits and meet the District's mission to reduce flooding risk with sustainable practices. As explained in Section 3.8, Hazards and Hazardous Materials, in the Draft EIR, the risk of public hazards from flooding in Frederick Allen Park would not increase because the Town of Ross closes access to the park and streets before storm events as part of their normal procedures for flood control in the area. The District also would post signs, notifying the public about the risk of flooding (see page 3.8-13 in the Draft EIR). The proposed project would have increased flood reduction benefits over Alternative 1, as shown in Figure 5.3-8 on page 5-33 in the Draft EIR. The parcels that would experience increased flood reduction benefits are discussed in Master Response 1. As described in Master Response 1, the District staff is

recommending adoption of Alternative 1 because of Town of Ross's preference for Alternative 1.

C9-24 The comment states that it would take years to construct the proposed project.

The proposed project would be constructed within the time frame stated in the Draft EIR (see Table 2.6-5 on page 2-38 in the Draft EIR regarding project construction timelines). The Frederick Allen Park components would be constructed within 7 months; however, as discussed in Section 3.1 of the EIR it would take several years for the trees to fully mature and grow to a canopy height of 30 feet, similar to the existing conditions.

C9-25 The comment suggests for the Town of Ross to hold the District to a higher standard and include a plan with verified and reliable hydraulic models.

The hydraulic models have been verified independently by consultants under contract to the Town of Ross, as discussed by Richard Simonitch at the Ross Town Council meeting on March 11, 2021. See response to comment C9-16 regarding the findings of the Town's independent model verification.

C9-26 The comment states that the District does not follow FEMA guidelines.

The District is not exempt from federal regulations and must comply with FEMA guidelines. The proposed project would undergo FEMA review, as discussed in Section 3.9, Hydrology and Water Quality in the Draft EIR. The proposed project would require permits and approvals from federal, State, and local agencies. See Table 2.8-1 on page 2-44 in the Draft EIR for a list of required permits or approvals for the proposed project, including required FEMA review and approvals.

Comment Letter C10

Comments of the CORTE MADERA CREEK PROJECT EIR

Submitted by: Suzanne Mabardy, 415-302-4383

3-15-21

The following comments are added to those given submitted on March 2, 2021 to all Marin County Supervisors, Joanna Dixon and Liz Lewis.

Comments added on March 16, 2021 are in italics.

TO: ALL MARIN COUNTY SUPERVISORS, Joanna Dixon, Liz Lewis

I am the owner of 1135 Sir Francis Drake, Kentfield (immediately upstream from Kentfield Hospital Bridge, Kentfield side) and across the concrete channel from Fredrick Allen Park. This area has NEVER FLOODED...thanks to good STRUCTURAL engineering.

I have read the EIR and have these comments and objections:

- 1) The project's primary objective is to improve flood management. This objective is NOT met. It is stated in the EIR page 3.9-60 that the **Hydrology Study** "shows either a reduction of flooding OR NO significant increase..." AND it shows increased flooding in areas around COM. This project simply does not achieve it's primary purpose! C10-1
- *The EIR is incomplete and should NOT be approved until the cost analysis for ALL action alternatives is made public, including the itemized cost for each feature within each alternative and each feature's ability and inability to achieve any significant level of flood protection.* C10-2
- *Further: The Hydraulics Report Appendix A, page 55, 8.3 "Optimization of Alternative J" states a preliminary economic analysis was conducted supporting Alternative J (4% AEP) as providing the "maximum benefit with consideration of the non-federal sponsor's preference." Further, it is highly probable that Alternative F, G and J allocate significant funds for the modification and beautification of Fredrick Allen Park, Town of Ross. AND it is highly probable that this expense (for the Town pf Ross) can instead be allocated toward achieving the primary purpose of this project: FLOOD MANAGEMENT.* C10-3

- ***Therefore, ALTERNATIVE B (and including the Bypass Culvert) may better achieve the primary objective, with proper use of funds for the proper purpose.*** C10-4

- 2) The EIR includes unsubstantiated statements regarding seismic concerns specific to the concrete channel only at Fredrick Allan Park, page 3.6.20. "The existing flood control channel wall is a concrete structure this a prone to damage under strong seismic events, whereas the proposed natural vegetated channel in FAPark would be less prone to damage or loss under a strong seismic event." C10-5

- *All content within the EIR suggesting seismic concerns exist and justifies the remove of the concrete wall at Fredrick Alan Park should be struck.* C10-6

- *It is unsubstantiated that the concrete channel at Fredrick Allen Park/Ross is the ONLY section "prone to damage" in a seismic event.* C10-7

- *a) Further, there is no seismic report.* C10-8

- *b) Further, the EIR omits available information relative to seismic conditions specific to creek banks at the Town of Ross:*

- *- Appendix N Geotechnical states, "There are no mapped active surface or subsurface faults crossing the Corte Madera Creek; page 4, 3.2.1*

- *- Appendix A: Hydrauloics, page 17, 18. discusses the evaluation of soil condition in the banks and creek bottom of the Town of Ross. This study determined the "subsurface materials consist predominantly of clays, sandy clays, and clayey sands…were **firm and stiff.**"*

- *- Appendix N Geotechnical page 8, 5.1 makes a comment on the soil condition, "The soil condition for the project indicates a relatively **stiff soil profile**."* C10-9

- *- Appendix N Geotechnical, page 5, 3.2.3 discusses seismically induced liquefaction hazard: "…soils most susceptible to liquefaction are loose, clean sands and silt." **NOTE: the subsurface soil on the banks in the Town of Ross are "firm and stiff."***

- *- Appendix N Geotechnical, page 7, 4.2.2, "Soil Conditions" for Unit 4, Town of Ross: it is reported "Groundwater was not encountered in boreholes." NOTE: This can suggest limited liquefaction hazard potential in a seismic even*

- 3) This project is heavily weighted as A BEAUTIFICATION PROJECT FOR THE TOWN OF ROSS PAID FOR BY MARIN COUNTY TAX PAYERS. There is no seismic nor scientific justification that Fredrick Allen Park must be redesigned and manicured. This feature is strictly for the benefit of the residence of the Town of Ross. If the Allen Park Corridor feature prevails (in Alternatives F, G, J)...THEN it is logical that the entire concrete wall should be treated in the SAME method and all communities along the Corte Madera Creek should have these same beautification benefits as the Town of Ross. C10-10

a) *The EIR fails to state the environmental impact with the elimination of the "Allen Park Corridor" feature from Alternatives F, G, J.* C10-11

b) *The EIR omits discussion on HOW Alternative J fails to achieve improved flood management yet it supports the costly secondary project: beautification of Fredrick Allen Park:* C10-12

Hydraulics Report Appendix A, page 52, 7.5.6 ***"Alternative J"*** *details the failings for flood management of Alternative J, while supporting beautification of the Allen Park Corridor without justification:* ***"...does not include creek widening at College of Marin or Kent Middle Schoo..uses a flood wall instead...and does not include bypass culverts at the College Avenue Bridge...and uses maximum flood wall height around Allen Park Corridor would be 2 feet."*** C10-13

4) The EIR omits discussion of the BASIC FUNCTION of the project as effected by the removal of the Dentil Fish Ladder. C10-14

a) *Neither the* ***CAUSE NOR the RELATIONSHIP*** *between the Dentil Fish Ladder and the project's primary goal (to improve flood management) is emphasized within the EIR.*

Hydraulics Report Appendix A, page 49, 7.4.1 states, ***"As a result of removing the fish ladder, channel modification would be necessary to accommodate the change in flow dynamic..creates the need to modify and lower the channel floor...widening portions of Unit 4...to increase hydraulic conveyance capacity."*** C10-15

b) *The EIR fails to clarifying the environmental impact with the elimination of this feature (the removal of the fish ladder) from all the Alternatives A, B, F, G, J.* ***If the fish ladder remains intact, the channel does NOT require modifications to increase hydraulic conveyance capacity, per the Hydraulics quote above.*** C10-16

2.5.10 Response to Letter C10: Suzanne Mabardy

C10-1 This comment is a repetition of comment C6-1.

See response to comment C6-1.

C10-2 This comments states that the Draft EIR is incomplete and should include cost analyses for all alternatives and for each feature. The comment also states that the Draft EIR should include each feature's ability or inability to achieve significant level of flood protection.

The CEQA process does not include consideration of economic or cost analysis, as described in Master Response 5. The USACE process, unlike CEQA, includes a cost-benefit analysis because that is a USACE regulatory requirement for projects that are funded by USACE. The proposed project would not be funded by USACE. Hydraulic modeling is produced for an alternative as a whole and is not produced on an element-by-element basis, because it would be misleading to propose modeling for elements that would be implemented only in combination and would not be implemented independently. Separate modeling was provided for the proposed project and Alternative 1, to provide the public and decision makers with the ability to evaluate the different flood risk reduction benefits of the proposed project and alternatives (also see Master Response 1 and Master Response 3).

C10-3 This comment states that significant funds are allocated for the modification and beautification of Frederick Allen Park, and this expense for the Town of Ross can be allocated for flood management.

The proposed project would not be funded by the Town of Ross but rather by grant funding and the District through Flood Zone 9 fees. The comment discusses alternatives that were considered in the previous USACE Draft EIS/EIR. Those alternatives are not relevant to the current Draft EIR and were screened-out in Chapter 5 of the Draft EIR. The alternatives that are discussed in the comment do not meet CEQA criteria for evaluation because they would not reduce any significant impact of the proposed project. The alternatives discussed in the comment would result in increased environmental impacts and would not be economically feasible to implement. See Table 5.2-1 on page 5-7 in the Draft EIR regarding the alternatives screening results.

C10-4 This comment expresses support for Alternative B.

Alternative B does not meet the feasibility criteria of the proposed project and is not considered in the Draft EIR. See Table 5.2-1 on page 5-7 in the Draft EIR regarding the alternatives screening results.

C10-5 This comment is a repetition of comment C6-2.

See response to comment C6-2.

C10-6 This comment states that the Draft EIR suggests the seismic concerns only exist in the Frederick Allen Park portion of the concrete channel.

See response to comment C6-2, which addresses the seismic concerns related to the concrete channel.

C10-7 This comment states that the statement regarding only the concrete channel in Frederick Allen Park being subject to a seismic event is unsubstantiated.

See response to comment C6-2, which addresses seismic concerns related to the concrete channel.

C10-8 This comment states that no seismic report exists.

Faults and seismicity are well documented in the project region. As discussed in Section 3.6 on page 3.6-5 in the Draft EIR. the project site is in an area subject to perceived severe to violent ground shaking and could be expected to cause moderately heavy to heavy damage to structures from a San Andreas Fault earthquake. The potential impacts from seismic shaking and seismically induced ground failures (e.g., liquefaction, lateral spreading, and/or landslides) at the project site are evaluated under Impact 3.6-1 on page 3.6-18 in the Draft EIR. As discussed under Impact 3.6-1, the District would implement Mitigation Measure 3.6-1 to conduct a site-specific geotechnical investigation and implementation of the geotechnical recommendations in final design of the flood walls, to address potential seismic impacts on the concrete channel stability from implementation of the proposed project or an alternative. Implementing Mitigation Measure 3.6-1 would reduce the impact from seismic shaking during operation to a less-than-significant level.

C10-9 This comment lists information related to seismic conditions that the commenter believes are missing from Appendices A and N in the Draft EIR.

The information that is provided in the comment is not relevant to the Draft EIR and is instead related to discussions in the USACE 2018 Draft EIS/EIR.

C10-10 This comment states that the proposed project would be a beautification project for the Town of Ross and suggests the entire concrete wall along Corte Madera Creek should be treated the same way if the Frederick Allen Park Corridor in Alternatives F, G, and J prevails.

This is a comment on the USACE 2018 Draft EIS/EIR and not on the current Draft EIR. See Table 5.2-1 on page 5-7 in the Draft EIR regarding the alternatives screening results and consideration of alternatives that would remove additional portions of the concrete channel in Units 3 and 2. The proposed project would achieve the objectives discussed in the Draft EIR. The proposed project would provide flood risk reduction benefits throughout portions of the town of Ross, unincorporated Kentfield, and Larkspur near Corte Madera Creek. The project flood reduction benefits and habitat improvement

benefits are well documented in the Draft EIR, and the proposed project would not be a beautification project.

C10-11 This comment states that the Draft EIR fails to address the environmental impacts with the elimination of the Allen Park Corridor feature from Alternatives F, G, and J.

This is a comment on the USACE 2018 Draft EIS/EIR and not on the current Draft EIR. Alternatives F, G and J are not considered but rejected for the purposes stated in Table 5.2-1 in the current Draft EIR. See Chapter 5, Alternatives, in the Draft EIR.

C10-12 This comment states that the Draft EIR fails to discuss how Alternative J achieves improved flood management.

This is a comment on the USACE 2018 Draft EIS/EIR and not the current Draft EIR. Alternative J is not considered in the current Draft EIR. See Chapter 5, Alternatives, in the Draft EIR.

C10-13 This comment states that the Hydraulic Report provided in Appendix A in the Draft EIR describes Alternative J failing to manage flood risk.

This is a comment on the USACE 2018 Draft EIS/EIR. Alternative J is not considered in the current Draft EIR. See Chapter 5, Alternatives, in the Draft EIR. The project benefits for flood risk reduction are discussed in Section 3.9, Hydrology and Water Quality, in the Draft EIR.

C10-14 This comment states that the Draft EIR omits discussion of the proposed project's basic function as affected by removal of the fish ladder.

The fish ladder removal is discussed and analyzed throughout the Draft EIR, from Section 3.1, Aesthetics and Visual Resources to Section 3.16, Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics. An alternative that would not modify Frederick Allen Park but would remove the fish ladder in the Town of Ross is considered to be Alternative 1. See Chapter 5, Alternatives, in the Draft EIR, and Master Response 1.

C10-15 This comment states that the Draft EIR does not emphasize the cause or the relationship between the fish ladder and the proposed project's primary goal to improve flood management.

The project benefits of flood risk management are discussed in Section 3.9, Hydrology and Water Quality, in the Draft EIR. Chapter 5, Alternatives, in the Draft EIR discusses the flood risk management benefits of Alternative 1, which would include the removal of the fish ladder but no construction in Frederick Allen Park. See Section 3.9 from page 3.9-54 regarding the project flood risk management benefits and Chapter 5 on page 5-26 in the Draft EIR regarding the flood risk management benefits of Alternative 1. Also see Master Response 1.

C10-16 This comment states that the Draft EIR fails to clarify the environmental impacts with the elimination of fish ladder removal from Alternatives A, B, F, G, and J.

This is a comment on the USACE 2018 Draft EIS/EIR. Fish ladder removal is discussed and analyzed throughout the current Draft EIR. See Section 3.1 to Section 3.16 of the current Draft EIR for a discussion of environmental impacts related to the fish ladder removal. The comment on the previous Draft EIS/EIR is not relevant to the current Draft EIR because the proposed project and alternatives under consideration have changed. Also see Master Response 1.

Comment Letter C11

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16 March 2021

Joanna Dixon, Project Manager
cortemaderacreek@marincounty.org

Submitted via email

Corte Madera Creek Flood Risk Reduction Management Project Draft EIR

Dear Ms. Dixon:

We are submitting this letter in opposition to the current Proposed Project, including the proposed removal of the concrete channel, the removal of the grove of trees between the channel and Sir Francis Drake homes such as ours, and the creation of a floodplain park, including substantial alterations to Frederick Allen Park. C11-1

Our family resides at 15 Sir Francis Drake Boulevard (on the "left bank" of Corte Madera Creek – the southwest side of the street, downstream from the Lagunitas Street Bridge). As discussed further below, our home, as well as others along the left bank, would be adversely affected in multiple ways by the current Proposed Project: C11-2

- The Proposed Project, with its removal of the existing functioning concrete channel, is more likely to increase rather than abate our risk of flooding. C11-3
- The Proposed Project would involve the gratuitous destruction of an existing mature habitat and offers only the dubious promise of creation of another habitat from scratch, which would likely take decades to grow and mature. The aesthetic loss – especially for those of us on the left bank – would be substantial. While we currently look upon a grove of trees, shrubbery, and other vegetation, we would instead have bare ground for the foreseeable future and would be looking at the back of businesses on the other side of the creek. C11-4 C11-5
- The elimination of the grove of trees currently abutting the channel and the removal of the channel itself would also result in a grievous loss of privacy, since our home would be exposed to everyone walking along the C11-6

path on the opposite side of the creek. C11-6 cont.

As the Board will recall, a very similar proposal was before the County and the U.S. Army Corps of Engineers in 2018. Through our attorney (Todd W. Smith), we submitted extensive comments on the Draft EIS/EIR for that prior proposal. (Nov. 27, 2018, ltr attached.) There are only two significant differences between the proposal now before this Board and the one considered in 2018-2019: 1) the Army Corps has effectively pulled out, so the current proposal is for a county project only; and 2) the current proposal drops the "Unit 4 Bypass" included in the 2018 proposal. Otherwise, however, the current Proposal Project poses the same problems detailed in our attached November 2018 comments on the prior proposal. We incorporate the November 2018 comment letter by reference and will only briefly reiterate the principal problems in this letter. With the exception of those directed to the Bypass, that letter's other comments are equally applicable to the most current iteration of this proposal. C11-7

Also, one feature that the current Proposed Project shares with the 2018 Bypass proposal is that our property, 15 Sir Francis Drake, will be uniquely impacted. Our house is immediately adjacent to the District-owned parcel of land that is likely to be used as a staging area for construction. Construction impacts (noise, exposure to toxic air contaminants, etc.) from the proposed destruction of the concrete channel, removal of the grove of trees, and other actions requiring heavy equipment will be concentrated in the area immediately adjacent to our home – which is also where we currently access our property from Sir Francis Drake and park our cars. As with the now-defunct Unit 4 Bypass proposal, the construction activities – and associated noise, dirt, toxic materials, and fumes – will likely render our home uninhabitable for at least several months, and possibly longer. Because the construction activities will require our family to relocate for an unknown number of months, the comments in our Nov. 27, 2018, letter related to the need for funding temporary relocation to local hotels remain applicable. C11-8

Removal of the Concrete Channel – Flood Risk. The Proposed Project (like its 2018 precursor) would remove the most effective flood abatement measure currently in place – the concrete channel. The concrete channel did not overflow during the flood of December 31, 2005 – or during the several "close calls" we have experienced over the 17½ years we have resided here. We are highly skeptical of the county's assurance that the Proposed Project will somehow abate the flooding risk for left bank properties such as ours. The county has altered its models several times over the long history of various iterations of a project along C11-9

-2-

these lines. In the December 31, 2005, flood and the several other near-floods we have experienced, water flowed through the left bank properties both from upstream at the bridge and from the opposite side (the northeast side) of Sir Francis Drake (particularly from the area of Marin Arts and Garden Center). C11-9 cont.

Although we raised the issue of overland water coming from the northeast side of Sir Francis Drake at the public scoping meeting, the Draft EIR entirely fails to address that topic. During the Dec. 31, 2005, flood, and several "close call" events over the years, the water flowing onto our property did not come exclusively from the Lagunitas Bridge area on the creek-side of Sir Francis Drake. There was also a heavy flow of water coming from the other side of Sir Francis Drake (from the vicinity of Marin Arts & Garden Center). In the Dec. 31, 2005, flood that overland water crossed Sir Francis Drake onto our property, joined with the creekside flow from the area of the Lagunitas Bridge, and inundated our property. The other near-flood events such as early 2017, the overland water from the other side of Sir Francis Drake came most of the way across the street and was on the verge of flooding our property again (as it had in 2005). The county's models entirely ignore this risk of flooding from overland water altogether and are based on the incorrect assumption that the flooding risk to our property comes exclusively from overflow at the bridge on the creekside of our property. Because the Proposed Project contemplates flood walls between the SFD homes and the creek, the Project presents a risk that, rather than protect the homes, those walls would effectively trap the overland water forcing it closer to the homes themselves. C11-10

The Draft EIR lacks clarity on the extent and impact of widening the creek upstream of the removed fish ladder. ("Segment of the new channel upstream of the removed fish ladder would be widened and provide a smooth grade transition that would support long term channel stability and reduce erosion potential. " (EIR/EIS, p. 3.9-12) How wide and how far upstream? Will this affect the Lagunitas Bridge?) We note that a peer review study prepared at the request of the Town of Ross, refers to a substantially lengthened New Lagunitas Bridge (which was recently rebuilt) for both the Proposed Project and Alternative #1. We do not have sufficient expertise on that subject to state ourselves whether the Proposed Project would require replacement, lengthening, or other redesign of the Lagunitas Bridge. But as members of the public who will be especially impacted by the Proposed Project, we are entitled to look to the Draft EIR for an authoritative analysis of the likely consequences of the proposed widening of the creek immediately upstream from our home. But the current Draft EIR wholly fails to address that subject. C11-11 C11-12

-3-

The funding grant requires that all construction be completed by the end of 2022. Although the Draft EIR does not need to address funding, how likely is it that this project can be completed in such a short period of time? What is the impact if this project is begun – a reliable existing section of the concrete channel removed, a habitat destroyed – and the project is then suspended? A commenced-but-suspended project would surely represent the worst of both worlds because the irreparable consequences of the project will come from its earliest stage – the destruction of the concrete channel and the removal of the grove of trees. A commenced-but-suspended project would leave our home (and others on the left bank) without the current protection of the concrete channel and unquestionably exposed to much greater flooding risks than under current conditions. Moreover, a commenced-but-suspended (or delayed) project would mean removal of the existing habitat of trees and other vegetation between our home and the creek but with no certainty when, if ever, the county will take any remedial efforts. On its face, the projection of completion of construction by the end-of-2022 appears highly unrealistic. Anyone with any familiarity with public works projects of this scale and complexity should have grave doubts where all the pieces will fall into place perfectly and vindicate that highly optimistic assumption. But, as addressed here, since all the adverse consequences from the project will be front-loaded – due especially to the destruction of the concrete channel – accurate assessment of the environmental consequences of the Proposed Project requires a realistic projection of its completion schedule, backed up by hard data.

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Removal of Existing Habitat and Resulting Aesthetic Loss. There is an existing mature habitat of trees and other foliage on the rise between the concrete channel and the residences on the left bank. While a putative purpose of the Proposed Project is restoration of the area around the creek to a more "natural" environment, the project would destroy an existing mature, rich habitat. Moreover, while one of the stated objectives of the Project is protection of fish, removal of the existing mature habitat on the rise alongside the creek would have the opposite impact. The existing mature trees provide shade along the creek and also moisture, both of which are essential to the overall ecosystem of the creek.

C11-20
C11-21

While we are told that new trees are to be planted, it would almost certainly be decades, not just a few years, before they would grow to the extent of the existing habitat. For a considerable time, there would be little but bare earth. Moreover, because Army Corps standards require a significant setback, the county would likely only be able to plant a narrow ribbon which would never replace the

C11-22
C11-23

-4-

existing grove it is proposing to raze. In sum, despite its stated object of creating a "riparian" corridor, the project would needlessly destroy an existing mature and rich habitat, and it presents only a highly doubtful promise of fabricating a new (but less extensive and diverse) habitat, which is unlikely to grow to maturity for decades (if ever). C11-23 cont. C11-24

Beyond the environmental consequences of the removal of this existing habitat of the grove of trees and other foliage, it is impossible to overstate the aesthetic impact of that loss. Currently, those of us on the southeast side of SFD look upon that greenery, which provides a foreground for the Marin hills in the distance. But removal of those trees would leave these homes with (for the first several years) a view of little more than bare earth and the backs of the businesses in downtown Ross. C11-25

Loss of Privacy. In addition to the loss of existing mature habitat, the elimination of the rows of trees and other foliage would significantly impact our privacy, as well as that of our neighbors on the south side of Sir Francis Drake. Currently, those trees shield our home from viewing those along the bike path on the opposite side of the creek. But the Proposed Project would remove that protection and leave our homes and others on our side of SFD exposed to everyone running, biking or hiking on the creek path, who would be able to look directly into our yard and house. Moreover, with the removal of the concrete channel, there would no longer be any physical barrier shielding our homes. This is a concern for all families along the street, especially those with children. C11-26 C11-27

Alternative #1

The county's "Alternative #1" would remove the existing fish ladder, but would not include the other significant features of the Proposed Project. It would not remove the concrete channel, remove the existing trees and foliage, or alter Frederick Allen Park. While Alternative #1 may seemingly be less ambitious than the Proposed Project, it appears more closely tailored to the principal object of flood reduction and would not entail the many adverse consequences associated with the Proposed Project – including the removal of the protections of the existing concrete channel, destruction of an existing mature habitat (the trees and foliage along the left bank), the aesthetic harm from the loss of that habitat, and the diminution of the privacy of the families residing along the left bank. C11-28

While the concrete channel has functioned well in preventing events like the C11-29

-5-

2005 flood from being even worse, the existing fish ladder is another matter. The current draft EIR/EIS states: "The Denil fish ladder, in its current condition, is a primary flow constriction for Unit 4 reach and upstream that causes extensive overbank flooding along Corte Madera Creek." (EIR/EIS, p. 3.9-12) Assuming that is so, then removal of the fish ladder would presumably alleviate that constriction and would reduce or abate the risk of such "overbank flooding."[1]

C11-29 cont.

A close comparisons of the Draft EIR's projections for the Proposed Project and for Alternative #1 indicates that removal of the fish ladder alone, while retaining the concrete channel, woud achieve virtually the same level of abatement of flood risks as the Proposed Project. Even according to the Draft EIR's projections, the asserted great flood risk reduction of the Proposed Project, as compared to Alternative #1, would be almost negligible – a fraction of one foot. But the environmental price from this promised additional increment of abatement would be enormous in both the short term and the long term.

C11-30

Alternative #1 would certainly be preferable to the Proposed Project because it would not entail the other adverse impacts – destruction of a mature habitat, aesthetic impairment, and diminution of privacy – described earlier.

C11-31

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We suggest that, in considering the Proposed Project, the county should consider the age-old medical adage, "First, do no harm." However, laudable some of its stated objectives may be, the Proposed Project would do substantial harm: While attempting to abate some flood risks, it would aggravate others. It would destroy

C11-32

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[1] Unfortunately, we must add a caveat to our discussion of Alternative #1. We are aware that some concerns have been raised concerning the accuracy of the models used by the county. Because we have no expertise regarding hydrological modeling, we cannot offer any opinion on that point. All we can say is this: If the county is correct in its assessment that the fish ladder has obstructed and impeded water flow and thus has contributed to flooding and if its removal does not create new water flow problems, then its removal presumably would help abate flood risks. The Draft EIR is required to provide sufficient detail on Alternatives for a reasonable comparison to the Proposed Project. The Draft EIR did not provide Alternative #1 Water Surface Elevation Maps for Current Conditions, or other information that would have been helpful in making this comparison.

C11-33

existing mature habitat – resulting both in damage to an ecosystem and significant aesthetic harm. And it would strip away the privacy which the existing trees and foliage provide to the families along this side of Sir Francis Drake. Indeed, in every respect, the Proposed Project would impose substantial costs – flood risk, aesthetic loss, and diminution of privacy – on the several families along this portion of Sir Francis Drake. The Proposed Project will do more harm than good, and we strongly urge the county to decline that proposal. C11-32 cont. C11-34 C11-35 C11-36

In contrast, Alternative #1 – removal of the fish ladder but without the other elements of the Proposed Project – will apparently make a positive contribution to abatement of flood risk, but without the several adverse consequences of the Proposed Project detailed here.[2] Additionally, of course, Alternative #1 would be far less disruptive to the daily lives of residents during execution of the project, would be less expensive for the county, and would not appear to pose the greater legal and liability uncertainties of the Proposed Project . C11-37 C11-38

We appreciate this opportunity for input on a proposal which would have a very significant impact on the families along this stretch of Sir Francis Drake. Thank you for considering these comments. Please feel free to contact us if any further information would be helpful.

Sincerely,

Leslie O'Connell, laoconnell@sbcglobal.net
James Bradley O'Connell, jboc@fdap.org

Attachment (Nov. 27, 2018, letter re EIS/EIR on prior proposal)

[2] Again, our comments on Alternative #1 are subject to the caveat that we are not in a position to assess the accuracy of the county's hydrological models and its assessment that the fish ladder has constricted water flow and contributed to prior flooding incidents and that its removal would not introduce new problems. C11-39

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November 27, 2018

Via U.S. and Electronic Mail

Cynthia Jo Fowler
Corte.Madera@usace.army.mil
U.S. Army Corps of Engineers, San Francisco District
ATTN: Cynthia Jo Fowler,
1455 Market Street, San Francisco, CA 94103-1398

Re: Corte Madera Creek Flood Risk Management Project Draft EIS/EIR

Dear Ms. Fowler:

This letter provides the comments of James Bradley O'Connell and Leslie A. O'Connell, Ph.D., on the Corte Madera Creek Flood Risk Management Project Draft Environmental Impact Statement/Environmental Impact Report ("Draft EIS/EIR") prepared by the U.S. Army Corp of Engineers ("USACOE") and the Marin County Flood Control and Water Conservation District ("District") (collectively, "Agencies"). The O'Connells own and reside at 15 Sir Francis Drake Blvd., Ross, CA 94957. As described in further detail below, their home will be directly impacted by the Project and as such the O'Connells have a significant interest in ensuring that the USACOE and the District have fulfilled their respective legal obligations under the National Environmental Policy Act ("NEPA")[1] and the California Environmental Quality Act ("CEQA")[2]. Unfortunately, the Draft EIS/EIR is legally deficient in numerous ways, not least of which are: an inadequate project description, in particular as it relates to core elements of Alternative J, designated the "Agency Preferred Alternative;" inadequate analysis of the Project's potentially significant impacts; and inadequate mitigation to address the Project's environmental impacts.[3] The Project should not proceed until the issues raised in this letter are addressed and the Draft EIS/EIR is revised and recirculated for further public review and comment. Otherwise, the USACOE and the

[1] 43 U.S.C. §§ 4321 et seq. NEPA is implemented pursuant to regulations promulgated by the Council on Environmental Quality ("CEQ"), codified at 40 C.F.R. §§ 1500 et seq. ("CEQ Regulations").
[2] Cal. Pub. Res. Code §§ 21000–21189; CEQA is implemented pursuant to California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000– 15387 ("CEQA Guidelines").
[3] For purposes of this letter, we use the term "Project" to refer to Alternative J since this alternative has been identified as the Agency Preferred Alternative and the Tentatively Selected Plan. The broader elements of the Risk Management Project and the other alternatives are separately referenced as such.

District will have failed in fulfilling their fundamental obligation to inform the public and decisionmakers of the potential environmental consequences of the Project.

BACKGROUND

The O'Connells' home is located on Sir Francis Drake Blvd. on a relatively narrow strip of land between the street and Corte Madera Creek. Their house abuts the existing concrete culvert and is (roughly) across the creek from the far-eastern end of Ross Commons. The O'Connells' property also immediately abuts the District-owned parcel of land where the Unit 4 Bypass is shown to terminate. See Draft EIS/EIR, Figure 3-5c. With permission from the District, the O'Connells - whose home lacks a driveway or garage - have used this parcel for off-street parking since they purchased the home in 2003.

The O'Connells' lived in their home during the 2005 Flood Event, which resulted in fast-flowing water surrounding their home on all sides for several hours and their basement being flooded. Importantly, during this event, the existing concrete channel did not overflow and was therefore not the source of the flooding on their property or the immediate surrounding area. Rather, the flooding came from the upstream overflow of Corte Madera Creek starting at Lagunitas Bridge, as well as from the eastside of Sir Francis Drake Blvd. in the area surrounding the Marin Art and Garden Center. Without the channel operating as designed, the flooding of the O'Connells' home and surrounding areas would likely have been significantly worse. The O'Connells have significant concerns that the Project proposes to remove the one element of the existing flood management system – the concrete channel – that did not fail during the 2005 flood and subsequent events and replace it with a vaguely described "Riparian Corridor." This concern is exacerbated by the fact that the Project will result in the Unit 4 Bypass emptying significant volumes of diverted water into this new, untested "Riparian Corridor" directly adjacent to their home.

Making matters worse, the Agencies have now identified Alternative J as the Agency Preferred Alternative and Tentatively Selected Plan despite the fact that this version of the Project, including in particular the creation of the Allen Park Riparian Corridor, was never disclosed in the Notice of Preparation/Notice of Intent ("NOP/NOI") for the Project or during the numerous community scoping meetings that occurred. To the O'Connells and numerous other members of the community, it feels as if the Agencies have pulled a bait and switch, promising a flood control project that would address the significant flooding problems that have plagued the Ross Valley community for decades, only to deliver a project that looks nothing like what has been discussed over the past several years.

NEPA and CEQA share a fundamental purpose: to inform the public and decision-makers about potentially significant environmental effects of proposed projects before they are carried out. See CEQA Guidelines § 15002(a)(1); 40 C.F.R. § 1500.1(b). Here, the public process that lead to the publication of the Draft EIS/EIR, and the document itself, fundamentally fail in this regard.

6.5

COMMENTS

1. The Description of Alternatives Fails to Comply with NEPA or CEQA.

While NEPA and CEQA are substantially similar, the two laws differ in important aspects. Whereas NEPA has been described as "essentially procedural" (*Stryker's Bay Neighborhood Council, Inc. v. Karlen* (1980) 444 U.S. 223), CEQA imposes substantive duties on local agencies to protect the environment and mitigate significant impacts when feasible. In serving these substantive mandates, courts have held that "an accurate, stable, and finite project description is the *sine qua non* of an informative and legally sufficient EIR." *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 197-200. The project must be described accurately to allow reviewers and decision makers to balance the project's benefits against its environmental costs, to consider mitigation measures, and to assess the advantages of the no-project and other alternatives. *Id.*; see also 40 C.F.R. § 1502.14 (description of alternatives including the proposed action "is the heart of the environmental impact statement" that "shall … (b) Devote **substantial treatment** to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.") (Emphasis added). C11-40

Here, while the "Description of Alternatives" has the trappings of the sufficient project description, it fails to provide sufficient detail to allow the public and decision-makers to understand to true scope of the Project. Specifically:

a. Construction of the Unit 4 Bypass is a fundamental component of the Agency Preferred Alternative. Nevertheless, the Draft EIS/EIR admits that the "[c]onstruction methodology of the bypass under Sir Francis Drake Boulevard has not yet been determined." Draft EIS/EIR, p. ES-8. The potential disruption to the Ross Valley community from construction of the Unit 4 Bypass cannot be overstated. Sir Francis Drake Blvd. is a heavily trafficked, two-lane major thoroughfare that provides the sole direct access to and from Highway 101. It also provides the sole eastbound access to the Kentfield Hospital. Disrupting traffic on the identified stretch of Sir Francis Drake Blvd. for any duration of time has the potential to, *inter alia*, cause significant traffic delays, increase response times for public safety vehicles in the area, limit eastbound access to Kentfield Hospital, and significantly increase exposure to toxic air contaminants from idling vehicles. The Draft EIS/EIR may not simply defer this issue to some future, unspecified time because the methodology chosen to construct the Unit 4 Bypass has the potential to directly affect the level of impact associated with these and other potentially significant environmental impacts, which then directly affects the viability and wisdom associated with approving Alternative J. The Description of Alternatives must be revised to specifically describe the various construction methodologies under consideration, and a comparison of impacts associated with the various methodologies must then be promulgated throughout the Draft EIS/EIR. C11-41

The description of the Unit 4 Bypass is also improperly vague concerning the transitions from Corte Madera Creek to Sir Francis Drake Blvd. The Description of Alternatives provides merely that "the bypass would exit and re-enter the creek at properties on Sir Francis Drake Boulevard that are owned by the District." Draft EIS/EIR p. 3-7. While this is true, it does not acknowledge that the parcel where re-entry to the creek will occur is immediately adjacent to the O'Connells residence. The failure to describe the close proximity of the re-entry parcel to an existing residence undermines the subsequent impact analysis, in terms of both construction impacts (e.g., noise, exposure to toxic air contaminants) and operational impacts (e.g., soil subsidence and erosion associated with the re-introduction of significant volumes of water directly adjacent to the O'Connells' residence). The Draft EIS/EIR must be revised to acknowledged and address these issues. C11-42

b. The Draft EIS/EIR provides that "the use of a temporary shoring system will need to be evaluated as sheet piles may not be sufficient to excavate to the depths currently anticipated for the bypass. Additional geotechnical investigations will be needed to better understand the subsurface soil and rock characteristics along the bypass alignment. This could have significant cost impacts during Project construction." By their own admission, the Agencies are deferring in-depth consideration of a fundamental component of the Project-construction methodology. As in Comment 1.a, this is legally inadequate. The Draft EIS/EIR must be revised to describe the potential scenarios and outcomes associated with this issue, and to compare the environmental impacts associated with those outcomes throughout the EIR. C11-43

c. The description of the Allen Park Riparian Corridor is wholly deficient. Initially, the Draft EIS/EIR fails to describe the existing environment in sufficient detail to allow the reader to understand what physical changes will occur with construction of the Allen Park Riparian Corridor. The Draft EIS/EIR states that Riparian Corridor will be constructed at Frederick P. Allen Park. Remarkably, the Draft EIS/EIR is completely silent about what will happen to the existing park setting. There is no description or estimate of the number of trees that may need to be removed, for example, or the potential loss of useable recreation area. Further, the Description of Alternatives provides that the Riparian Corridor "would include a widened, native substrate channel that allows higher flows to spread over a larger area ...." Draft EIS/EIR p. 3-7. Presumably, implementation of a "native substrate channel" involves removal of the existing concrete channel in this area, though this is not described anywhere. C11-44

The various tables describing the construction activities provide no additional information. Table 3-3 – Construction Measures for Each Alternative identifies the following as the "Phase 1 (Unit 3)" construction activities: "Prepare site (grade changes, clearing and grubbing, tree removal); Construct Allen Park Riparian Corridor; Remove existing Denil fish ladder and replace with smooth transition between Units 3 and 4." Each of these activities sounds benign enough, if vague, until compared to Table 3-5, which notes C11-45

(without explanation) that these activities will require use of, e.g., articulated haulers, earth moving dozers, dump trucks, and various types of excavators, loaders, and soil compactors. The Description of Alternatives must be revised to properly describe the scope of construction associated with the Allen Park Riparian Corridor, as well as the alleged "operational" benefits of removing an existing concrete channel that has not overflowed in the past and replacing it with an incomplete alternative. See Draft EIS/EIS, App.A, p. 50 ("Further refinements are being developed for the Allen Park Riparian Corridor by the District and could be incorporated into the Recommended Plan. As a result, some design elements (e.g. floodwalls) may change prior Preconstruction Engineering and Design (PED) for the Recommended Plan. The Recommended Plan will be updated based on the R&U analysis that will be conducted.

C11-45 Cont.

d. The Draft EIS/EIR states that funding has yet to be secured for the Unit 4 Bypass, which means that, if Alternative J is selected as the Project, there is a legitimate possibility that only "Phase 1" of the Project will be constructed. Phase 1 includes the removal of the Denil fish ladder and the construction of the Allen Park Riparian Corridor only. Since the Draft EIS/EIR has expressly acknowledged the possibility that only Phase 1 will be constructed, it must separately analyze and mitigate the potential environmental effects of Phase 1. Otherwise, the Draft EIS/EIR fails to inform the public and decision makers of the potential consequences and tradeoffs of selecting Alternative J. This is particularly important here because, absent the Unit 4 Bypass, the upstream conditions that have resulted in the most significant flooding during past flood events will remain unaddressed while the one component of the existing flood management system that has not failed during past flood events – the concrete channel in Unit 3 – will be removed and replaced by a new and untested Riparian Corridor.

C11-46

2. The Description of the Existing Setting is Inadequate.

Pursuant to CEQA Guidelines § 15125(a), an EIR "must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." See also 40 C.F.R. § 1502.15 ("The environmental impact statement shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration."). The Draft EIS/EIR fundamentally fails in this regard.

C11-47

Generally, the Draft EIS/EIR fails to identify the number of buildings and habitable structures that are impacted under the current conditions in the event of a 10-year, 25-year, or 100-year flood event. The failure to include this information means that the environmental analysis fails to compare impacts to structures under the existing conditions to the impacts that would occur under

C11-48

the Project. Without this information, the public and decision-makers are left to guess whether the Project will actually improve conditions. C11-48 Cont.

More specifically, the Draft EIS/EIR fails to describe in any detail the existing conditions in the area where the Allen Park Riparian Corridor is proposed to be constructed. This includes the existing park and recreational pathways that connect Ross to Kentfield along the existing culvert, as well as the residences, including the O'Connells' residence, on the other side of the channel. The existing environmental includes a significant number of mature trees on both sides of the creek. In particular, the existing trees and vegetation on the side of the Sir Francis Drake Blvd.-side of the creek serve as a forested curtain that provide noise and privacy screening for the residents along this stretch. The failure to properly describe this setting results in the Draft EIS/EIR ignoring potential environmental impact, including but not limited to aesthetic and noise impacts, as further discussed below. C11-49

3. The Draft EIS/EIRs Reliance on Avoidance and Minimization Measures is Not Permitted by CEQA.

Throughout Chapter 4 of the Draft EIS/EIR, the document includes "Avoidance and Minimization Measures" under the analysis of environmental consequences. The Draft EIS/EIR relies upon these Avoidance and Minimization Measures to reach the various environmental significance determinations. In other words, the Avoidance and Minimization Measures are essentially included as part of the Project and the significance determinations assume the measures will be implemented. This analytical approach fails for several reasons.

First, the general inclusion of Avoidance and Minimization Measures as part of the overall Project is not permitted under CEQA. Pursuant to *Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 656, measures designed to reduce or mitigate impacts cannot be incorporated as part of the Project where doing so results in the EIR's failure to disclose significant impacts and the effectiveness of mitigation measures in reducing those impacts. Here, by assuming the Avoidance and Minimization Measures are part of the Project for purposes of the impact analysis, the Draft EIS/EIR has failed to disclose the true impacts of the Project and to separately determine the feasibility of the Avoidance and Minimization Measures to reduce impacts. Further, the Avoidance and Minimization Measures have not been incorporated into the Mitigation Monitoring and Reporting Program, which means they are not legally enforceable pursuant to CEQA. See CEQA Guidelines § 15126.4(a)(2) ("mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments."). As structured, the Avoidance and Minimization Measures are essentially optional, and the Agencies would be free to ignore those measures if they prove inconvenient. C11-50

The Draft EIS/EIR also lacks substantial evidence concerning the feasibility of the various Avoidance and Mitigation Measures, and simply assumes, in remarkably abbreviated analysis, that the measures are not only feasible, but will reduce the Project's impacts to less than significant in C11-51

numerous instances. The analysis of Impact GEO-3 is but one example of this improper approach. Pursuant to Impact GEO-3, the Project would have a potentially significant impact if it would "result in substantial soil erosion or the loss of topsoil." In discussing whether the Project's implementation, rather than construction, would have such an impact, the Draft EIS/EIR provides only the following: "Each of the alternatives could directly or indirectly result in accelerated soil erosion." The analysis fails to disclose how this might occur, or where along the Project path such erosion is most likely to occur. For example, the Project proposes to re-introduce large volumes of water from the Unit 4 Bypass into the creek at the new Riparian Corridor, which includes construction of a "native substrate channel." The Draft EIS/EIR fails to discuss how the deposition of this large volume of water might impact or accelerate soil erosion in this area once the exiting concrete channel is removed.

C11-51 Cont.

As if the short-hand analysis of this issue was not bad enough, the Draft EIR then concludes that "implementation of AMMs would result in a less than significant impact for all action alternatives." However, the Draft EIS/EIR fails to explain how these (unenforceable) measures will actually achieve this goal. There is absolutely no discussion of the feasibility of the various Avoidance and Minimization Measures; nor does the Draft EIS/EIR include any substantial evidence concerning these measures feasibility.

C11-52

In addition, many of the Avoidance and Minimization Measures amount to improper deferred mitigation under CEQA. Pursuant CEQA, formulation of mitigation measures should not be deferred to a future date unless measures include a specific, enforceable performance standard. See e.g., *Save Panoche Valley v. San Benito County* (2013) 217 Cal.App.4th 503, 525. The Avoidance and Minimization Measures include numerous examples where the sole obligation is to develop a future plan. See e.g., AMM-GEO-1, AMM-GEO-3. Such future plan obligations have been consistently rejected by the courts as inadequate under CEQA. See e.g., *Endangered Habitats League, Inc. v. County of Orange* (2005) 141 Cal.App.4th 777, 793-394 (mitigation of construction impacts inadequate because it merely required a report to be prepared for county approval without setting any standards). This issue is exacerbated here since the Avoidance and Minimization Measures are not legally enforceable as mitigation measures under CEQA, meaning the Agencies have not only deferred the development of the measures designed to mitigate Project impacts, but have not committed themselves to actually implement these measures.

C11-53

To address these issues, the Draft EIS/EIR needs to be revised and recirculated to include analysis of the Project's impacts both with and without the Avoidance and Mitigation Measures. See *Mission Bay Alliance v. Office of Community Investment & Infrastructure* (2016) 6 Cal.App.5th 160, 185 (incorporation of Transportation Service Plan into project description did not violate CEQA where EIR disclosed and analyzed impacts to transportation and traffic both with and without plan). Further, the analysis needs to be expanded to demonstrate the feasibility of these measures, in particular in the context of the specific Project-features the Agencies have selected as part of the Agency Preferred Alternative (e.g., the Riparian Corridor). Finally, to the extent the Avoidance and Minimization Measures are required to be implemented pursuant to a separate

C11-54

regulatory scheme (i.e., an NPDES permit) or are necessary to mitigate the Project's impacts to less than significant, the measures must be incorporated into the Mitigation Monitoring and Reporting Program and made separately legally enforceable. C11-54 Cont.

4. Specific Comments on Chapter 4.

a. 4.1 Hydrology and Hydraulics

i. Section 4.1.3.2, Methodology for Impact Analysis and Significance Thresholds, states that "Alternative J was designed to provide a flood protection for 4% AEP Flood events within and upstream of the Frederick S. Allen Park (Allen Park) Riparian Corridor, but downstream of the Allen Park Riparian Corridor was not." However, there is no explanation why this decision was made or discussion of the potential consequences of such decision. See App. A, § 8.3. The Draft EIS/EIR must be revised to address this issue. C11-55

ii. Neither Section 4.1.3.3 Effects and Mitigation nor Appendix A seems to provide information concerning the volume of water that will be diverted through the Unit 4 Bypass and reintroduced to the creek at the newly constructed Riparian Corridor. The reintroduction of large volumes of water in this area combined with the removal of the existing concrete barrier has the potential to affect the nearby natural berm through accelerated soil subsidence and erosion. Without information concerning the volume of reintroduced water, it is impossible to evaluate these concerns. C11-56

iii. Based on a comparison of Plates 4 (Alternative A) and 5 (B) to Plates 6 (F), 7 (G) and 8 (J) in Appendix A, it is not clear how construction of the Riparian Corridor improves potential flood conditions in the area surrounding the Riparian Corridor. Plates 6-8 appear to show 4% ACE Flood depths of up to 3-5 feet in the area of the Riparian Corridor (though admittedly the color scheme makes the Plates difficult to read), whereas Plates 4 and 5 appear to show no 4% ACE Flood depths without the Riparian Corridor. The discussion in Section 4.1.3.3 ignores this issue and instead focuses on the purportedly improved conditions downstream from the Riparian Corridor. However, Plate 8 seems to indicate that the 4% ACE Flood depths downstream in the area of College of Marin are the worst under Alternative J, presumably because of the unexplained decision not to design to the 4% AEP Flood standard under Alternative J. The Draft EIS/EIR needs to better explain why Alternative J is the Agency Preferred Alternative in light of this information. C11-57

b. 4.4 Air Quality C11-58

i. As noted above in Section 1, the failure to identify the construction methodology for the Unit 4 Bypass makes any assessment of construction-related air emissions legally inadequate. Nevertheless, the Draft EIS/EIR purports to analyze construction-related emissions. Since the Draft EIS/EIR has failed to identify the construction methodology for the Unit 4 Bypass, this information appears to be mostly speculative and therefore in adequate for purposes of assessing the actual scope of the air quality impacts associated with the Project. Thus, the Air Quality analysis needs to be revised and recirculated to identify and compare the various methodologies under consideration, and to identify mitigation as necessary. Only by including such information can the public and decision-makers have the appropriate level of information to select between the various Alternatives.

C11-58 Cont.

ii. The Draft EIS/EIR focuses solely on emissions from construction equipment. However, lengthy traffic delays resulting in significant increases in idling time are a reasonably foreseeable impact of the Project. Specifically, by proposing to construct the Unit 4 Bypass under a very busy, two-lane thoroughfare for which there are virtually no alternative routes, Alternatives G, H, and J will cause significant traffic delays that are not inherent in Alternatives A and B. Such delays will result in an increase in vehicle idling time, which will result in an increase in air emissions, in particular diesel particulate matter. Thus, when compared to Alternatives A and B, Alternatives G, H and J will have greater impacts to air quality during the construction period. The Air Quality analysis needs to be revised and recirculated to include this information and consider any appropriate mitigation. Otherwise, the public and decision makers lack he necessary information to make informed choices between the various Alternatives.

C11-59

c. 4.8 – Aesthetics

i. Page 4.8-14 includes the following statement: "Because additional mitigation measures for Impacts AES1-1 and AES-2 are not feasible beyond the existing AMMs, significant impacts were determined to be significant and unavoidable." This statement is problematic for several reasons. First, no AMM AES-2 is identified. Second, in Table 3-7, no AMMs are identified for Aesthetics whatsoever. Third, there is no analysis or substantial evidence supporting the statement that "additional mitigation measures … are not feasible;" therefore, the Draft EIS/EIR must be revised and recirculated to either change this conclusion or provide an explanation. See Comment 3. That explanation must include what mitigation measures might have been found to be infeasible and why.

C11-60

ii. The impact analysis includes numerous statements concerning Project activities that are not included in the Project description, creating an unstable project description, uncertainty concerning what activities the Project will undertake, and

C11-61

confusion as to the scope of the Project impacts. For example, on p. 4.8-18, the Draft EIS/EIR states: "A tree survey would be completed prior to Project implementation **if tree removal would be required**, as determined during preconstruction engineering design. Revegetation along Sir Francis Drake Boulevard would be completed, and additional tree planting **could** be required elsewhere to accommodate local policy." (Emphases added). While tree removal is identified as a potential Project component in Table 3-3, this statement makes it seem as if tree removal is not a certainty. Instead, the decision concerning tree removal will apparently be made by engineers, without opportunity for public comment and the consideration of potential mitigation measures. Further, the analysis provides that trees "could be" replaced elsewhere according to local policy, a possibility not included in the Project Description. The analysis also fails to identify the local policy in question, fails to identify the "elsewhere" trees might be planted and the potential aesthetic impacts associated with those locations, and fails to explain the process by which all of these decisions will be made.

C11-61 Cont.

Page 4.8-18 also includes the following statement: "Grading of the park would require removal of trees and other vegetation. **The park would be revegetated with native riparian habitat with species similar to those in Unit 4, with a less dense canopy to maintain a "park-like" appearance**." Again, this statement is found nowhere in the Description of Alternatives, creating uncertainty as to whether this work is a component of the Project or is being proposed as a form of mitigation. Further, there is no explanation concerning the types of "native riparian habitat" that would be used to revegetate the park, who gets to make the decision concerning the appropriate denseness of the tree canopy, and what opportunity the public will have in commenting and shaping these very vague activities. Further, the proposed floodwalls along the creek in the area of the Riparian Corridor will have underground foundations and footings, ensuring that the only feasible replacement vegetation will be shallow-rooting trees and plants. The Draft EIS/EIS fails to acknowledge this fact, identify the type of shallow-rooted trees and plants that might be viable in this changed environment, or analyze the potential aesthetic impacts associated with this change.

C11-62

The Draft EIS/EIR needs to be revised and recirculated to explain whether these and other statements are meant to be components of the Project, the details concerning these activities, who the decision-makers will be since the Agencies lack jurisdiction over these matters, and what opportunities there will be for public involvement.

C11-63

iii. The analysis fails to consider the aesthetic impacts to the neighbors, including the O'Connells, who will be impacted by the implementation of the Riparian Habitat. The existing trees and foliage on the Sir Francis Drake Blvd.-side of the creek serve

C11-64

as a forested curtain providing privacy and noise reduction for the residents along this stretch. The removal of the trees will substantially degrade the visual quality of this area and create an essentially barren stretch of land. The analysis needs to be revised to address this issue, both as a short-term construction impact and a long-term "operational" impact. The fact that the floodwalls will limit the types of trees and foliage that will be able to be planted along this stretch post-project only exacerbates the O'Connells' concerns. Further, the Draft EIS/EIR needs to include mitigation requiring implementation of natural privacy screening during construction (e.g., through use of mature potted trees and plants) as well as the permanent replacement of trees and vegetation on private property impacted by the Project, in particular the construction of the Riparian Habitat. Such mitigation is facially feasible and therefore must be considered.

C11-64 Cont.

d. 4.10 Noise

i. The analysis for Impact NOI-1 identifies Mitigation NOI-1 but concludes that, even with implementation of this measure, the impact would be significant and unavoidable. As noted above, the O'Connells' residence is located immediately adjacent to the District-owned parcel identified for use as the re-entry point for the Unit 4 Bypass. The parcel is in such close proximity to their home that they have used it for parking, with the District's permission, since they purchased the home in 2003. Additional feasible mitigation must be considered and adopted, such as funding the temporary relocation to local hotels or AirBNBs for receptors such as the O'Connells who will be most affected by the construction noise.[4]

C11-65

CONCLUSION

For the foregoing reasons, as well as for the reasons stated in other comment letters on the Draft EIS/EIR which are incorporated herein by reference, the Draft EIS/EIR must be revised and recirculated so the public and decision makers can understand the actual environmental effects from the Project.

C11-66

Sincerely,

Todd W. Smith

Cc: Brad and Leslie O'Connell

[4] This mitigation measure has been found feasible for other California projects involving significant construction noise. See https://pslweb.co.kern.ca.us/UtilityPages/Planning/EIRS/oil_gas/DraftEIR/Oil_Gas_DEIR_Vol1_Complete.pdf.

2.5.11 Response to Letter C11: Leslie O'Connell and James Bradley O'Connell

C11-1 This comment states the commenters' opposition to the proposed project, and specifically to project elements in Frederick Allen Park.

This commenter's opposition to the proposed project is acknowledged. See Master Response 1 regarding the staff's recommendation to adopt Alternative 1.

C11-2 This comment states that the commenters' home would be adversely affected by the proposed project, as discussed in the comments that follow.

See the responses to comments that follow.

C11-3 This comment states that the proposed project is likely to increase rather than abate flood risk on the commenters' property at 15 Sir Francis Drake Boulevard.

The flood risk reduction benefits to properties along the creek channel are shown in Figure 3.9-7 to Figure 3.9-9 on pages 3.9-55 to 3.9-57 in the Draft EIR. As shown in Figure 3.9-7 (during the 10-year flood event) and Figure 3.9-8 (during the 25-year flood event), the commenters' property is in the "Flows Confined to Channel" area, meaning that the area no longer would have flood inundation from creek overtopping after the proposed project is completed. As shown in Figure 3.9-9 (during 100-year flood event), the commenters' property is in the "Flooding Reduced" area, meaning that the property would have significantly reduced flood inundation (greater than 0.2 foot) from creek overtopping after the proposed project is completed. Therefore, the proposed project would have beneficial flood risk impact on the commenters' property.

C11-4 The comment states that the proposed project would have destructive effects on the mature habitat in Frederick Allen Park.

See Master Response 6.

C11-5 The comment states that the proposed project would result in a substantial aesthetic loss for properties on the left bank, and the project would result in views of bare ground from the commenters' property.

Implementation of the proposed project would result in significant impact on visual quality in the Frederick Allen Park area, as discussed in the Draft EIR (starting from page 3.1-24). The District would implement Mitigation Measure 3.1-3: Large Tree Planning to integrate large box trees into the planning plan and design for Frederick Allen Park. The mitigation would reduce the visual impact immediately following landscaping by providing screening of concrete structures and surrounding buildings; however, the impact would remain significant and unavoidable until the tree canopy is re-established. See Master Response 4 for a discussion about private views and privacy.

C11-6 This comment states that the proposed project would result in loss of privacy because of tree removal.

See Master Response 4 for discussions related to loss of privacy.

C11-7 This comment states that the commenters have submitted a comment letter on the USACE 2018 Draft EIS/EIR, and that the proposed project poses the same problems detailed in that comment letter.

The comment is on the USACE 2018 Draft EIS/EIR and not the proposed project EIR. See the responses to comments C11-40 through C11-66 with responses to the comment letter that was submitted regarding the USACE 2018 Draft EIS/EIR.

C11-8 This comment states that the commenters' property would be used for staging, and the commenters likely would be affected by noise and air quality pollution. The comment also states that the proposed project would require the commenters to relocate during project construction.

The staging areas proposed for project construction are shown in Figure 2.6-1 on page 2-7 in the Draft EIR. As shown in the figure, no staging would occur on private property. Project construction would occur only on weekdays during daytime construction hours, as discussed in Section 2.6.10 on page 2-38 in the Draft EIR. No project construction and associated noise, dust generation, or air quality emissions would occur during nighttime hours or on weekends.

Impact 3.2-2 beginning on page 3.2-22 and Impact 3.2-3 beginning on page 3.2-26 in Section 3.2 in the Draft EIR discuss potential impacts on air quality emissions and include mitigation measures to reduce potentially significant impacts on air quality. As discussed under Impact 3.2-2, the fugitive dust impact from construction would be reduced to a less-than-significant level with implementation of Mitigation Measure 3.2-2, which would require implementation of the BAAQMD's fugitive dust control measures. As discussed under Impact 3.2-3, the short-term health risk impact on sensitive receptors from project construction emissions would be reduced to a less-than-significant level with implementation of Mitigation Measure 3.2-3, which would require all off-road diesel-powered equipment (more than 25 horsepower) to be equipped with engines that achieve USEPA emission standards.

The potential impacts of project construction noise and vibration are discussed under Impacts 3.10-1 and 3.10-2, on pages 3.10-15 to 3.10-24 in Section 3.10 of the Draft EIR. As discussed in Section 3.10, the proposed project would result in temporary significant noise and vibration impacts on nearby sensitive receptors. However, with implementation of Mitigation Measure 3.10-1, which would include preparation and implementation of a noise reduction plan with notification and use of a noise barrier, and implementation of Mitigation Measure 3.10-2, which would include monitoring of vibration levels in proximity to properties to avoid exceeding the vibration threshold, the temporary noise and vibration impacts associated with project construction would be reduced to less-than-significant levels. Refer to Master Response 1 for a discussion of the District staff's recommendation to adopt Alternative 1.

C11-9 This comment states that the concrete channel is the most effective flood abatement measure, and the commenters are skeptical about the proposed project's ability to reduce flood risk for properties on the left bank.

Refer to Impact 3.9-5 of the Draft EIR (starting from page 3.9-54) for a discussion of the project impact related to flooding hazards. See response to comment C11-3 regarding the project flood risk reduction benefit to properties. The proposed project would reduce the amount of water that backs up and exits the Corte Madera Creek channel and would reduce the amount of water that flows down into properties in proximity to Corte Madera Creek, thereby reducing flood risk though the downstream areas.

C11-10 This comment states that the Draft EIR and hydraulic model fail to address the flood risk from overland water.

The District is responsible for addressing flood risk reduction on Corte Madera Creek only. Localized flooding from overland and residential areas is outside the District's jurisdiction and is the responsibility of the Town. The hydraulic model addresses flood risk from Corte Madera Creek because this is the focus of the proposed project and within the District's responsibility and jurisdiction. The project would result in a net reduction of flood areas thereby reducing the exposure of people and property to water related hazards. The project would result in flood reduction benefits for over 300 parcels in Ross Valley during a 25-year flood event under existing conditions. Refer to Impact 3.9-5 of the Draft EIR (starting from page 3.9-54) for a discussion of project flood impact to people and property.

C11-11 This comment states that the Draft EIR does not clarify the extent and impact of widening the creek upstream from the fish ladder removal. The comment also asks how wide and how far the widening would be, and how it would affect the Lagunitas Road Bridge.

The extent of the creek widening upstream from the fish ladder removal is shown in Figure 2.5-1 on page 2-8 in the Draft EIR. The impacts related to channel widening are discussed throughout the Draft EIR, from Section 3.1 to Section 3.16. Additional details about the proposed creek widening at the transition between Unit 4 and Unit 3 are presented in Master Response 1. The widening will be only along the section of the creek downstream from Lagunitas Road Bridge.

C11-12 This comment states that the Draft EIR does not address any potential modifications to Lagunitas Road Bridge because the proposed project or Alternative 1 likely would impact the bridge because of widening of the creek upstream.

Neither the proposed project nor Alternative 1 propose modifications to Lagunitas Road Bridge, which was replaced in 2010. As discussed in Section 3.9 on page 3.9-9 in the Draft EIR, Lagunitas Road Bridge was replaced and designed with a higher soffit that increased the creek capacity at the bridge crossing. Therefore, no modification is

proposed at this bridge because of the recent replacement and improvement for flood control. See Response to Comment C11-11 regarding the extent of creek widening.

C11-13 This comment asks how likely the proposed project would be for completion by the end of 2022.

Based on the District's experience in constructing similar projects, completion of project construction would be feasible by the end of 2022, if project approvals are received in time to start construction in April 2022.

C11-14 This comment asks what the impact would be if the proposed project is suspended after a section of the concrete channel is removed and habitat is disturbed.

Project construction would start only if all project approvals were received to complete the entire project. Project construction would not start unless completion of the project was feasible as designed. The construction contract could require completion of all work proposed within a defined schedule. The impact analysis in the Draft EIR is based on the reasonable assumption that the work will not be suspended, once begun.

C11-15 This comment states that a commenced-but-suspended project would be the worst-case scenario.

This would not be a potential scenario. See response to comment C11-14 for a discussion of this scenario and why it would not occur, based on the contractual requirements of the construction contractor.

C11-16 This comment discusses potential impacts of a commenced-but-suspended scenario.

See responses to comments C11-14 and C11-15 for more details about why this scenario would not occur.

C11-17 This comment discusses potential impacts of a commenced-but-suspended scenario.

See responses to comments C11-14 and C11-15 for more details about why this scenario would not occur.

C11-18 This comment states that completing the proposed project by the end of 2022 would be unrealistic.

The District is working diligently to obtain all approvals to meet the project schedule, should the project be approved. See response to comment C11-13 for a discussion about meeting the project schedule.

C11-19 This comment states that the proposed project would require a realistic projection of completion schedule, backed up by hard data.

The proposed project schedule is based on best engineering practices and is realistic based on the District's and consulting engineers' experience in completing similar projects within similar time frames. Chapter 5, Alternatives, in the Draft EIR includes an analysis of the No Project Alternative, which represents the expected future conditions if no change would occur in the current channel conditions. See Section 5.3.1 on page 5-14 in the Draft EIR for more information regarding the No Project Alternative.

C11-20 This comment states that the proposed project would destroy an existing mature and rich habitat between the concrete channel and the residence on the left bank.

See Master Response 6 for a discussion about the existing conditions and proposed improvements in Frederick Allen Park.

C11-21 This comment states that the existing mature trees provide essential ecosystem functions to the creek and wildlife, and that removing the trees would have an opposite impact.

See response to comment C11-20 for a discussion about the proposed project improvements in Frederick Allen Park.

C11-22 This comment states that it would take decades for the replanted trees to mature, and in the meanwhile, minimal vegetation and bare ground would be on site.

See response to comment C11-5. As discussed, understory vegetation, including shrubs and grasses, would be planted to avoid creation of bare ground. The District would be required to revegetate disturbed areas, in compliance with Marin County Code (Section 28.18.093) and the Construction Stormwater General Permit, to meet water quality goals and Stormwater Pollution Prevention Plan requirements.

C11-23 This comment states that the District likely would be able to create a narrow ribbon of habitat because of USACE's 15-foot setback requirements.

The planting plan in the Draft EIR presents the most conservative USACE requirements. USACE may not consider the 2-foot-tall floodwall proposed in Frederick Allen Park to be a floodwall, and therefore may not require a setback for tree planting. USACE indicated that it would not consider the 10-foot-tall retaining walls to be floodwalls because the retaining walls are proposed for channel stability and not flood protection. Therefore, USACE would not require setbacks from the retaining walls. See also Master Response 1.

C11-24 This comment states that the proposed project would destroy existing mature and rich habitat and create a habitat that would take decades to grow to maturity.

See response to comment C11-20 regarding the existing landscaping and proposed improvements in Frederick Allen Park.

C11-25 This comment states that the proposed project would result in impacts on the views from private properties adjacent to Frederick Allen Park because of tree removal.

See Master Response 4 for a discussion related to private views and privacy under CEQA.

C11-26 This comment states that the proposed project would result in loss of privacy to residences because of tree removal.

See Master Response 4 for a discussion related to private views and privacy under CEQA.

C11-27 This comment states that the proposed project would result in loss from removal of a physical barrier shielding homes related to the removal of the concrete channel.

This comment addresses the merits of the project, but not the environmental analysis. Impacts related to security on private properties are not considered to be within the context of CEQA. As discussed in Section 3.11, Public Services, in the Draft EIR, the proposed project would result in less-than-significant impacts on public services, including police and fire protection. See Impact 3.11-1 from page 3.11-5 in the Draft EIR for more information about potential impacts on public services.

C11-28 This comment summarizes proposed activities related to Alternative 1 and states that Alternative 1 would meet the project objective of flood reduction and avoid adverse environmental impacts.

This comment mischaracterized Alternative 1, which includes all proposed project elements except Frederick Allen Park concrete channel removal and restoration. See Master Response 1 and Master Response 3.

C11-29 This comment states that fish ladder removal presumably would alleviate the constriction and would reduce or abate the risk of flooding.

Removal of the fish ladder and avoidance of Frederick Allen Park is considered as Alternative 1 in the Draft EIR. See Section 5.3.2 from page 5-19 in the Draft EIR for a discussion of Alternative 1. Also see Master Response 1 and Master Response 3.

C11-30 This comment states that the flood risk reduction benefits would be similar between the proposed project and Alternative 1, but project implementation would result in more adverse environmental impacts than implementing Alternative 1.

This comment is acknowledged. See Master Response 1 for information regarding Alternative 1 and Table 5.4-1 on page 5-52 in the Draft EIR for a summary of the comparison of alternatives and the proposed project. The Draft EIR includes water surface elevation maps (Figure 5.3-5 to Figure 5.3-7) for Alternative 1 and a map

(Figure 5.3-8) showing the change in water surface elevation between the proposed project and Alternative 1.

C11-31 This comment states that Alternative 1 would avoid adverse impacts on mature habitat, aesthetics, and privacy.

See Master Response 1 regarding staff's recommendation to adopt Alternative 1. Also see Master Response 4 regarding private views and Master Response 6 regarding Frederick Allen Park and habitat.

C11-32 This comment states that the proposed project would destroy existing mature habitat and suggests for the District to consider doing no harm.

See response to comment C11-20 for a discussion about the existing conditions and proposed improvements in Frederick Allen Park. Also see Master Response 6.

C11-33 This comment states that the commenters have no expertise regarding hydraulic modeling, and thus cannot offer any opinion on this topic. The comment also states that the Draft EIR does not include sufficient detail on alternatives for a reasonable comparison to the proposed project and does not include water surface elevation maps for Alternative 1.

The Town of Ross has hired an independent consultant to verify the hydraulic model, and the consultant has concluded that the model is robust and reasonable. See response to comment C9-16 for a discussion about verification of the hydraulic model.

The Draft EIR includes water surface elevation maps (Figure 5.3-5 to Figure 5.3-7) for Alternative 1 and a map (Figure 5.3-8) showing the change in water surface elevation between the proposed project and Alternative 1. This is substantial evidence for comparison between the proposed project and Alternative 1, supporting the analysis of impacts for both the proposed project and Alternative 1 under CEQA. Additional details about Alternative 1 and updated modeling to reflect the 60 percent design are discussed in Master Response 3.

C11-34 This comment states that the proposed project would result in loss of privacy to residences on the left bank because of tree removal.

This comment is similar to comment C11-16; see response to comment C11-26.

C11-35 This comment states that the proposed project would result in flood risk and impacts on aesthetics and privacy on properties along the left bank.

As shown in Figure 3.9-7 to Figure 3.9-9 on pages 3.9-55 to 3.9-57 in the Draft EIR, the proposed project would result in flood reduction benefits for private properties along the left bank. The perception of increased flood risk is not substantiated by any evidence or science. The flooding would be reduced, based on scientifically and industry accepted

models. Aesthetic and privacy impacts on private properties are not considered to be within the context of CEQA, as discussed in responses to comments C11-25 and C11-26.

C11-36 This comment states opposition to the proposed project.

The commenter's opposition to the proposed project is acknowledged. See Master Response 1 regarding staff's recommendation to adopt Alternative 1.

C11-37 This comment states that Alternative 1 would achieve the goal of reducing flood risk and avoid adverse impacts from project implementation.

See Master Response 1 regarding staff's recommendation to adopt Alternative 1.

C11-38 This comment states that Alternative 1 would be less disruptive, less expensive, and have less uncertainties in comparison to the proposed project.

See Master Response 1 regarding staff's recommendation to adopt Alternative 1.

C11-39 This comment states that the commenters have no expertise to assess the accuracy of the hydraulic model.

The comment does not address the adequacy or accuracy of the Draft EIR or the modeling presented in the Draft EIR.

C11-40 This comment states that the description of the alternatives in the 2018 Draft EIS/EIR fails to comply with NEPA or CEQA.

This comment, as well as comments C11-41 through C11-66, address the 2018 Draft EIS/EIR, and not the current project or the current Draft EIR. Therefore, responses are provided only to those issues raised in these comments that are pertinent to the current project and the current Draft EIR.

The District prepared the current EIR pursuant to CEQA. The Alternatives chapter, screening of alternatives, and evaluation of alternatives presented in Chapter 5 of the Draft EIR, was completed in compliance with CEQA. The proposed project is no longer a federally funded project, and therefore NEPA compliance is not required. The analysis of alternatives in the Draft EIR exceeds CEQA's requirements for a comparative evaluation of alternatives and includes a robust evaluation of Alternative 1, including hydraulic modeling and air quality dispersion modeling.

C11-41 This comment states that the Unit 4 bypass that is described in the 2018 Draft EIS/EIR is a fundamental component of the agency-preferred alternative.

The Unit 4 bypass is not a component of the proposed project and is not part of any alternative that is considered in the Draft EIR. As discussed in Table 5.2-1 in the Draft EIR, the bypass construction would result in greater environmental impacts than the

proposed project, and the cost to construct the bypass would exceed the available funding.

C11-42 This comment states that the description of the Unit 4 bypass in the 2018 Draft EIS/EIR is vague concerning the transition from Corte Madera Creek to Sit Francis Drake Boulevard.

See response to comment C11-21. The Unit 4 bypass is not a component of the proposed project and is not part of any alternative that is considered in the Draft EIR.

C11-43 This comment refers to the 2018 Draft EIS/EIR statement that the use of a temporary shoring system will need to be evaluated for the bypass.

See response to comment C11-21. The Unit 4 bypass is not a component of the proposed project and is not part of any alternative that is considered in the Draft EIR.

C11-44 This comment states that the description of the Frederick Allen Park riparian corridor in the 2018 Draft EIS/EIR is deficient.

Pages 2-16 through 2-19 of the current Draft EIR present substantial detail about the activities that would be conducted at Frederick Allen Park, including relocation of Bike Route 20 and a landscaping plan; pages 2-28 and 2-29 discuss the maximum number of trees that would be removed from the park; pages 2-36 and 2-37 discuss the number of trees that would be planted in the park; and Section 3.12.6 of the EIR present an analysis of impacts on recreational areas.

C11-45 This comment states that the description of alternatives in the 2018 Draft EIS/EIR needs to be revised to properly describe the scope of construction in Frederick Allen Park.

The current Draft EIR sufficiently describes the proposed scope of construction within Frederick Allen Park, in Chapter 2, Project Description, in the Draft EIR. Alternative 1 is a reduced footprint alternative that would not construct any project elements in Frederick Allen Park. The description of the Unit 4 transition is presented in Chapter 2, Project Description, in the Draft EIR. Master Response 3 presents additional detail on the Unit 4 transition.

C11-46 This comment refers to the 2018 Draft EIS/EIR statement that funding has yet to be secured for the Unit 4 bypass, which means that, if Alternative J is selected for project implementation, possibly only Phase 1 will be constructed.

This comment is not relevant to the proposed project. The District has flood Zone 9 funding and a matching California Department of Water Resources grant that is available to fund project construction. The District would not proceed with contracting and construction unless it had the funding available to complete the proposed project and achieve the project objectives.

C11-47 This comment states that the description of the existing setting in the 2018 Draft EIS/EIR is inadequate.

The current Draft EIR includes substantial detail about the existing physical environmental conditions in each environmental resource section. The existing setting for each resource is provided as follows: Section 3.1.4 (Aesthetics), Section 3.2.3 (Air Quality), Section 3.3.3 (Biological Resources), Section 3.4.2 (Cultural Resources), Section 3.5.2 (Energy), Section 3.6.3 (Geology and Soils), Section 3.7.3 (Greenhouse Gas Emissions), Section 3.8.4 (Hazards and Hazardous Materials), Section 3.9.3 (Hydrology and Water Quality), Section 3.10.4 (Noise), Section 3.11.3 (Public Services), Section 3.12.3 (Recreation), Section 3.13.3 (Transportation and Circulation), Section 3.14.3 (Tribal Cultural Resources), Section 3.15.2 (Utilities and Service Systems), and Section 3.16.2 (Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, and Wildfire and Socioeconomics).

C11-48 This comment states that, in general, the 2018 Draft EIS/EIR fails to identify the number of buildings and habitable structures that would be affected under the existing conditions in the event of a 10-year, 25-year, or 100-year flood event.

The current Draft EIR includes the hydraulic model results for the 10-year, 25-year, and 100-year flood events for the proposed project and Alternative 1 and includes an evaluation of impacts under existing and future conditions. The analysis determined that the proposed project and Alternative 1 would cause no significant increase in flooding in any areas containing structures. In addition, Table 3.9-7 on page 3.9-60 in the Draft EIR summarizes project flood reduction benefits and shows the number of parcels that would experience significant reduction in flooding from the proposed project, based on the model-predicted reduction in water surface elevation for those parcels in the 25-year flood event.

C11-49 This comment states that the 2018 Draft EIS/EIR fails to describe the existing conditions in the area where the Fredrick Allen Park project components are proposed in any detail.

The current Draft EIR presents substantial information on the existing conditions in Frederick Allen Park, including visual quality, existing vegetation and trees, recreational features, and existing noise conditions. See Sections 3.1, 3.3, 3.12, and 3.10 in the Draft EIR for discussions of the existing conditions and analyses of project impacts on aesthetics, biological resources, recreation, and noise resources in Frederick Allen Park, respectively.

C11-50 This comment states that the 2018 Draft EIS/EIR's reliance on avoidance and minimization measures is not permitted by CEQA.

The current Draft EIR does not include avoidance and minimization measures. This comment is not relevant to the Draft EIR.

C11-51 This comment states that the 2018 Draft EIS/EIR lacks substantial evidence concerning the feasibility of the various avoidance and mitigation measures.

The current Draft EIR does not include avoidance and minimization measures. This comment is not relevant to the Draft EIR.

C11-52 This comment states that the 2018 Draft EIS/EIR concludes that implementation of avoidance and minimization measures would result in a less-than-significant impact for all action alternatives but does not explain how these measures actually would achieve this goal.

The current Draft EIR does not include avoidance and minimization measures. This comment is not relevant to the Draft EIR.

C11-53 This comment states that many of the avoidance and minimization measures in the 2018 Draft EIS/EIR amount to improper deferred mitigation under CEQA.

The current Draft EIR does not include avoidance and minimization measures. This comment is not relevant to the Draft EIR.

C11-54 This comment states that the 2018 Draft EIS/EIR needs to be revised and recirculated to include analysis of the proposed project's impacts, both with and without the avoidance and mitigation measures.

The current Draft EIR does not include avoidance and minimization measures. This comment is not relevant to the Draft EIR.

C11-55 This comment states that the 2018 Draft EIS/EIR does not provide an explanation or discussion of consequences regarding the design of Alternative J and flood protection downstream from Frederick Allen Park.

This comment is not relevant to the current Draft EIR because the Draft EIR does not include Alternative J as an alternative considered in detail. Table 3.9-7 on page 3.9-60 in the Draft EIR summarizes project flood reduction benefits and shows the number of parcels that would experience significant reduction in flooding from the proposed project and the model-predicted reduction in water surface elevation for those parcels.

C11-56 This comment states that the 2018 Draft EIS/EIR does not provide information concerning the volume of water that would be diverted through the Unit 4 bypass and re-introduced to the creek in the new riparian corridor.

The bypass is not a component of the proposed project and is not a component of any alternative that is considered in detail in the Draft EIR; therefore, analysis of the hydraulic effects of the bypass are not needed because the bypass would not be implemented as part of the proposed project or any alternative that may be approved.

C11-57 This comment states that the 2018 Draft EIS/EIR fails to clarify how construction of the riparian corridor would improve potential flood conditions in the area surrounding the riparian corridor.

Information on the relative flood risk reduction benefits of the proposed project, which would include Frederick Allen Park, and Alternative 1, which would not include Frederick Allen Park, are presented on page 5-26 in Chapter 5 in the Draft EIR. See Master Response 1 for additional details regarding the reduction in flooding that would be provided by the riparian corridor in Frederick Allen Park.

C11-58 This comment states the failure of the 2018 Draft EIR/EIS to identify the construction methodology for the Unit 4 bypass, making any assessment of construction-related air emissions legally inadequate.

The bypass is not a component of the proposed project and is not part of any alternative that has been considered in detail in the Draft EIR. The Draft EIR presents substantial detail about the proposed project and Alternative 1 construction methods and includes air quality modeling using two different methods to evaluate criteria pollutant generation for construction as a whole and concentrations of criteria pollutants as part of a health risk assessment. Pages 3.2-16 through 3.2-20 of the Draft EIR describe the approach to the impact analysis, including the methodology for evaluating criterial air pollutants and toxic air contaminants. Additional details about the air quality modeling are provided in Appendix C in the Draft EIR.

C11-59 This comment states that the 2018 Draft EIS/EIR focuses on emissions from construction equipment and does not include lengthy traffic delays, specifically occurring from construction of the Unit 4 bypass, which would result in significant increases in idling time.

The proposed project no longer includes the Unit 4 bypass. The number of vehicles and trucks that would be required for project construction would not result in long idling times. Additional details about construction equipment emissions are presented in Section 3.2, Air Quality, in the Draft EIR.

C11-60 This comment states that the 2018 Draft EIS/EIR needs to explain why mitigation measures are not feasible for Impacts AES-1 and AES-2.

The current Draft EIR includes Mitigation Measure 3.1-3: Large Tree Planting to reduce the visual impact immediately following landscaping in Frederick Allen Park, by providing increased screening of concrete structures and surrounding buildings. However, the impact would remain significant and unavoidable until the tree canopy is re-established, and the trees and vegetation would screen the retaining walls and adjacent structures. The analysis of impacts on visual quality in Frederick Allen Park is presented from page 3.1-21 through page 3.1-28 in the Draft EIR.

C11-61 This comment states that the impact analysis in the 2018 Draft EIS/EIR includes numerous statements concerning project activities that are not included in the Project Description.

The current Draft EIR presents substantial details about the proposed project to support the impact analysis in Chapter 3. The maximum extent of tree removal is presented in the Project Description (see Table 2.6-2 on page 2-28), and Figures 2.6-2, 2.6-3, and 2.6-4 show trees that would be removed as part of the proposed project or would meet USACE 15-foot setback requirements. The actual extent of tree removal would be substantially less than the number presented in the Draft EIR, if USACE would not enforce a 15-foot setback from the existing flood control channel walls.

C11-62 This comment refers to the 2018 Draft EIS/EIR analysis statement that Frederick Allen Park would be revegetated with native riparian habitat with species similar to those in Unit 4, but this is not discussed in the description of the alternatives.

The proposed landscaping and tree removal in Frederick Allen Park are described in detail in Chapter 2, Project Description, in the Draft EIR. The approach to landscaping of the park was developed by a landscape architect to reflect the proposed hydrologic and soil conditions that would occur in the area after the proposed project is constructed.

C11-63 This comment states that the 2018 Draft EIS/EIR needs to be revised and recirculated to explain whether these and other statements are meant to be components of the proposed project, the details concerning these activities, who the decision-makers would be because the agencies would lack jurisdiction over these matters, and what opportunities would exist for public involvement.

This comment addresses the 2018 Draft EIS/EIR, not the current EIR. The current Draft EIR does not need to be recirculated, as discussed in Chapter 1, Introduction, Section 1.3.

C11-64 This comment states that the 2018 Draft EIS/EIR analysis fails to consider the aesthetic impacts on the neighbors, including the O'Connells, who would be affected by implementation of the riparian habitat.

The analysis of project impacts in Section 3.1 in the current Draft EIR presents substantial details about project impacts on aesthetics from tree removal. The visual simulations reflect the maximum amount of tree removal and grading that would occur in Frederick Allen Park. See Master Response 4 regarding impacts on private views under CEQA.

C11-65 This comment states that in the 2018 Draft EIS/EIR, the analysis for Impact NOI-1 identifies Mitigation NOI-1 but concludes that, even with implementation of this measure, the impact would be significant and unavoidable.

The analysis of impacts in Section 3.10 in the current Draft EIR discusses the noise levels that would be produced during project construction without mitigation and the noise

levels that would be produced with mitigation. The analysis concludes that the impact would be less than significant with mitigation incorporated.

C11-66 This comment states that the 2018 Draft EIS/EIR must be revised and recirculated so that the public and decision-makers can understand the actual environmental effects of the proposed project.

This is a comment about the 2018 Draft EIS/EIR. The Draft EIR does not need to be recirculated as discussed in the Introduction to the Final EIR.

Comment Letter C12

From: Garril Page <obility@comcast.net>
Sent: Tuesday, March 16, 2021 12:14 PM
To: cortemaderacreek@marincounty.org
Subject: DEIR response

March 16, 2021

Joanna Dixon, Project Manager
Civic Center Suite 304
San Rafael CA 94903

I appreciate the opportunity presented by this public review period and submit the following Comments and Questions about the Draft EIR.

3.9 HYDROLOGY AND WATER QUALITY

Section 3.9.3 and 3.9.5 are cited as Response to my Comments as published in the DEIR; this was a disappointment. I anticipated "Potential hydrology and water quality impacts that could result from construction and operation of the project and mitigation measures to avoid or reduce significant adverse impacts are then discussed…". However, I found no such discussions. C12-1

This is especially troubling as I believed the purpose of the DEIR is to provide information about the impacts of flood mitigation projects, and per 3.9.3 "The focus of this project is to address the second mechanism of overland flooding, which is due to capacity constraints at Corte Madera Creek…"Evaluating technical feasibility is essential part of the CEQA evaluation process. The DEIR says Alternative 1 would be feasible to construct. C12-2

Questions:

a.) How feasible is the incorporation of Alternative 1 into the elements of fish ladder removal and transition into Unit 4? C12-3

b.) What what changed channel conditions result from this construction? C12-4

The project elements of fish ladder removal and the transition between Unit 4's natural creek bed downstream to the entry of the concrete channel are critically important; however, analysis of impacts from these elements lacks data on which to base any consideration. In modeling potential project design, the DEIR states the stream bed is to be widened and deepened to relieve constriction and regulate flow through the projected transition. C12-5

1

The number of feet the proposed transition may extend appears to range from 150 to 450' upstream of the Lagunitas Bridge, as well as through the bridge opening and downstream to the connection at the concrete channel, approximately 1100 feet in all. The natural channel's current width is approximately 20-25' and the concrete channel is 33'. Proposed widening is a substantial and significant impact which must be included in FEIR as is quantification of bank stabilization elements. C12-5 cont.

Because this area is the entry to the Town of Ross, is adjacent to municipal services and administrative buildings, and is a major intersection for Ross School and local traffic, both pedestrian and vehicular, it is particularly disappointing that the DEIR fails to provide information enabling any meaningful understanding of what is proposed here. This must be remedied, lest the FEIR also fail to adequately assess potentially significant environmental impacts and fail to proceed "in the manner required by law and as supported by substantial evidence under the California Environmental Quality Act (CEQA)." C12-6

Questions:

a.) What are the dimensions of the proposed design: how wide and how deep over what distance? C12-7

b.) What are the impacts on the area in which these elements are constructed? C12-8

The DEIR 3.9 mentions hydrology, hydraulic conditions, and modeling for "Project" or "projects" "Frederick Allen Park floodplain improvements" "Frederick Allen Park component concept design" but provides no comparable hydrological information for Alternatives. C12-9

Page 3.9-34 and a number of public meeting presentations have mentioned merging of HEC-RAS programs to model, design, and achieve the most effective performance for up- and downstream projects. C12-10

Questions:

a.) Was Alternative 1 modeled without construction of SAFRRP, proposed replacement of Winship and the other bridges from which federal funding have been "indefinitely delayed"? C12-11

b.) Was Alt 1 modeled with the SAFRRP? C12-12

c.) Was Alt 1 modeled with SAFRRP and the Winship Bridge replacement? C12-13

d.) If this information is omitted, how are readers of the EIR and c decision-makers to analyze baseline hydraulic conditions for the Alternative requested by the Ross Town Council per CEQA Guidelines? This is a serious defect. C12-14

Lacking such information, DEIR Section 5 Alternatives also is flawed. Whether under Hydrology or Alternatives, the following should have been discussed for consideration:

5.1.3 An EIR is required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. C12-15
Evaluating technical feasibility is essential part of the CEQA process. The DEIR says Alternative 1 would be feasible to construct.

Question:

2

How feasible is the incorporation of Alt 1 with the project elements of fish ladder removal and transition into Unit 4? C12-15 cont.

5.2.3 **CEQA Requirements for Alternatives Section 15126.6(a)** requires under (3)
"... (including consideration of whether the alternative itself could create significant environmental effects potentially greater than those of the project)?"

Alternative 1 has two major benefits: saving the existing character of FAP and maintaining supercritical flow in the concrete channel. Residents have experienced and recorded the fact that supercritical flow lowers water surface elevation (WSE) by accelerating flows in the concrete channel. These accelerated flows transport a large, fast volume of water, including local drainage carried to the creek in municipal pipe lines, sediment and flood debris out of Ross toward the Bay.
If upstream channel modifications alter channel conditions, thereby creating a resultant sub-critical flow within the upper 750' of the Unit 3 concrete channel, this is a significant impact on Ross. C12-16

Question:

Where is the discussion and mitigation of these impacts? C12-17

Adding flapgates to the drainpipes entering the creek will certainly impact local drainage, and residents so affected must understand this impact. C12-18

Question:

Where is the discussion and mitigation of this impact? C12-19

3.9-42 **Operation and Maintenance** "Maintenance of the proposed project will include routine vegetation management, sediment and debris removal, and annual inspection and maintenance of the floodwalls and structures. Vegetation management would likely occur annually or on an as-needed basis and would not include ground-disturbing activities and would employ hand tools..." C12-20

Questions:

The many newly-planted trees in FAP would be vulnerable to flood events for several years as they become established.

a.) In the event of overbank conditions uprooting recently-installed project elements (trees, irrigation, benches, shade structures) which may create a logjam and induce flooding, is Ross indemnified against harm? C12-21

b.) What agency is responsible for immediate and subsequent emergency aid? C12-22

c.) What agency will clean up the debris and repair damages to vegetation and infrastructure suffered? C12-23

d.) What agency replants and restores the area? C12-24

e.) Who pays for all this? C12-25

3

Table 5.2-1 Alternatives Screening Results

I incorporate by reference my Comments on the USACE EIS/EIR regarding inherent, induced flooding and impacts of the projects listed in this section, developed in prior documents, and now incorporated into the current EIR.

C12-26

5.3.2 Alternative 1: Reduced Footprint–Avoid Frederick Allen Park

The description of this Alternative does not match the slide (Figure 5.3-8 in DEIR) shown at the Marin County Board of Supervisor's March 2, 2021, Presentation. [https://marin.granicus.com/player/clip/10551?view_id=9&redirect=true]The ensuing confusion was sufficient to cause the Marin Supervisor *in whose District the projects lie*, to believe there would be channel construction within FAP under Alt 1. Any further misinformation about this should be clarified for the FEIR.

C12-27

Comment:

Texts should match tables at visual presentations in public meetings, especially when such public presentations are part of the EIR process.

Transcript:

> SUPERVISOR KATIE RICE asked the Paramount consultant to explain the apparent overbank flooding shown in red on that slide #37.
> SUSANNE HEIM: "Yeah, so this is actually the area within Frederick Allen park where, because there's the Frederick Allen park flood -- currently the park is above the flood plain because the grading would lower the elevation of the park and the channel would actually be relocated through this area, there would then be a higher water surface elevations (sic) than there are today because of the lowering of the, the (sic) grade in that area.
>
> > KATIE RICE: OK and, and I was understanding that Alternative 1 avoided improvements to Frederick Allen Park but I guess I misunderstood, need to go back — so there would be a flooding out of bank that there is not now?
>
> SUSANNE HEIM: So, what it means is the WSE in this area would be higher with the proposed project but the reason why it is modelled as being higher is because the ground surface elevation is lower. So, it is basically like you have more water on top of the ground, but your ground is actually lower—."

C12-28

5-24 Geology and Soils

Alternative 1 Impacts "Alternative 1 would include construction of project components on similar ground and soil substrate as the proposed project. Alternative 1 would have less-than-significant impacts associated with seismicity and seismic-related events."

C12-29

Comments:

a.) This should be aligned with Resolution No. 2018-46 of Marin County Board of Supervisors which cites "...750 feet of seismically unsafe portions of the concrete channel and subsequent grading to realign and widen existing creek channel...."
See page 14, Subtask 4.3: GRANT AGREEMENT 4600012423 between DWR and Marin County Flood Control and Water Conservation District per CA Water Code Section 83002 and Public Resources Code Section 5096.827 *et seq.*

C12-29 cont.

b.) Proposed larger fish pools to be installed the length of the concrete channel should be modeled on proposed alternatives to assure project performance and channel flow and seismic stability for Alternatives presented, especially Alternative 1 requested by the Town of Ross.

C12-30

c.) Proposed StormWater Pump Station and Access Ramp: The ramp will breach the existing channel wall. SInce the lower portion of the channel was constructed before the upper 750' feet of "seismically unsafe" concrete in upper Unit 3, the question of channel stability arises here, too. Per Section 15126.6(a) of the CEQA Guidelines and **Project Goals and Objectives; "4. Operational Reliability.** Improve operational reliability and reduce long-term maintenance costs by increasing maintenance access, improving channel stability, and protecting existing utilities."

C12-31

Comments:

a.) Operational reliability should be aligned with Resolution No.2018-46.

C12-32

b.) Increased traffic, noise, air quality from channel and project maintenance should be discussed as an impact on the community burdened when this ramp replaces the current less-accessible creek access points where maintenance is accomplished using ropes and buckets. (per MCWQFC Zone 9 meeting March 10, 2021)

C12-33

5-24 **Geology and Soils** Alternative 1 would require soil-disturbing activities, including tree and concrete removal, which would result in soil loss.

C12-34

Questions:

a.) What trees are to be removed in Alternative 1?

b.) Will replacement trees be planted in the same area providing comparable screening and privacy?

C12-35

I look forward to a FEIR that is fully responsive to the questions and comments above.

Thank you.

Garril Page
San Anselmo.

Email Disclaimer: https://www.marincounty.org/main/disclaimers

5

2.5.12 Response to Letter C12: Garril Page

C12-1 This comment states that the commenter is not able to find responses in the Draft EIR that discuss project construction and operational impacts related to hydrology and water quality and the associated mitigation measures.

Project construction and operational impacts on hydrology and water quality are discussed in detail under Impact 3.9-1 to Impact 3.9-5 on pages 3.9-39 to 3.9-63 in the Draft EIR. As discussed, the proposed project would not risk release of pollutants because of project inundation related to tsunami, would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan, and would not expose people or property to flooding hazards. The proposed project would have less-than-significant impacts related to erosion, siltation, runoff, flood flows, and impeding or redirecting flood flows. The proposed project would have the potential to transport contaminated sediment to the San Francisco Bay during construction activities in Unit 3, where the concrete channel would be removed in Frederick Allen Park, which would be a significant impact on water quality. However, the significant impact would be reduced to a less-than-significant level with implementation of Mitigation Measure 3.9-1, which would require testing of soils and sediment at risk of erosion or mobilization and removal or immobilization of any soils found to be over applicable water quality standards. See Impact 3.9-1 to Impact 3.9-5 on pages 3.9-39 to 3.9-63 of the Draft EIR for detailed analysis of the project impacts on hydrology and water quality.

C12-2 This comment states that evaluating technical feasibility is essential part of the CEQA process, and the commenter found it difficult to believe that Alternative 1 would be feasible to construct.

As discussed in Chapter 5, Alternatives in the Draft EIR, Alternative 1 would meet the feasibility criteria and thus is retained for detailed analysis in the Draft EIR. See Table 5.2-1 on page 5-7 in the Draft EIR for a summary of the alternatives screening results, and see Master Response 3 for a discussion of Alternative 1 and the 60 percent design for Alternative 1. Alternative 1 would be feasible and is recommended for adoption as discussed in Master Response 1.

C12-3 This comment asks about the feasibility of incorporating Alternative 1 into the fish ladder removal and Unit 4 transition project elements.

Alternative 1 would meet all the CEQA feasibility criteria. See Master Response 1 and Master Response 3 for a discussion of Alternative 1.

C12-4 This comment asks how the channel condition would be changed because of Alternative 1.

Refer to Section 5.3.2 of the Draft EIR (starting from page 5-19) for a description of Alternative 1 and potential environmental impacts associated with Alternative 1. See Master Response 1 and Master Response 3 for additional details on Alternative 1.

C12-5 This comment states that the fish ladder removal and transition to natural creek in Unit 4 would be critically important project elements, but the Draft EIR lacks data to back up the analysis of impacts resulting from these project elements.

The transition between Unit 4 and the concrete channel are included in the project description in the Draft EIR. Additional details have been developed in the 60 percent design for the project, as presented in Master Response 3. Also see response to comment C11-11.

C12-6 This comment states that the Draft EIR fails to provide information about what is being proposed in Frederick Allen Park and Unit 4. The comment also requests that the Final EIR adequately assess potential significant environmental impacts associated with the project elements in these areas.

Project elements proposed in Frederick Allen Park and Unit 4 are described in detail in Section 2.5.3 from pages 2-14 to 2-19 in the Draft EIR. These project elements also are shown in Figure 2.5-1 on page 2-9 in the Draft EIR. Substantial discussion is presented throughout the Draft EIR sections that are dedicated to analysis of the project elements in Frederick Allen Park and Unit 4. The analysis provides substantial evidence and fully complies with the requirements of CEQA. See Section 3.1 to Section 3.16 of the Draft EIR for detailed discussions of potential impacts from project elements in Frederick Allen Park and Unit 4. Where the potential impacts in Unit 4 and Frederick Allen Park differ from other parts of the proposed project, separate headings are used to provide the reader with the specific impacts of each project element. This separate analysis was provided in the Draft EIR to assist the reader in understanding the potential impacts that are specific to each element.

C12-7 This comment asks about the dimensions for the proposed design in Unit 4.

See response to comment C11-11. In addition, see Master Response 3 regarding the 60 percent design for Unit 4 with Alternative 1.

C12-8 This comment asks what the potential impacts would be for project elements implemented in Frederick Allen Park and Unit 4.

Project impacts are discussed in detail in the Draft EIR. See Section 3.1 to Section 3.16 of the Draft EIR for a detailed discussion of potential impacts from project elements in Frederick Allen Park and Unit 4. Also see response to comment C12-6.

C12-9 This comment states that no comparable hydrological information is presented for the alternatives in the Draft EIR.

The analysis of alternatives is presented in Chapter 5, Alternatives, in the Draft EIR. See Chapter 5 from page 5-14 for descriptions and environmental impacts and analysis of the alternatives. Detailed hydrologic model results are presented in Chapter 5 for Alternative 1. As discussed in Chapter 5, Alternative 2 and 3 still would involve removal of the fish ladder and implementation of proposed project elements in Frederick Allen Park, and would have similar flood risk reduction benefits to the proposed project; therefore, separate modeling of the elements was not conducted. Additional modeling was performed for the 60% design for Alternative 1, as presented in Master Response 3.

C12-10 This comment states that the Draft EIR and public meeting have mentioned merging of HEC-RAS programs to model and design, to achieve the most effective performance for upstream and downstream projects.

The future condition modeling reflects upstream projects that are proposed or completed on Corte Madera Creek and upstream waterways. Refer to Master Response 3 for a discussion of refinements to and integration of the hydraulic modeling.

C12-11 This comment asks whether or not Alternative 1 was modeled with the San Anselmo Flood Risk Reduction Project, Winship Bridge Replacement Project, and other bridge projects.

Alternative 1 was modeled under the existing conditions and future conditions. The modeling for future conditions included the San Anselmo Flood Risk Reduction Project, Winship Bridge Replacement Project, and other bridge projects listed in Table 3.9-5 in the Draft EIR. Updated modeling, including future condition modeling, based on the 60 percent design is presented in Master Response 3.

C12-12 This comment asks whether or not Alternative 1 was modeled with the San Anselmo Flood Risk Reduction Project.

See response to comment C12-11.

C12-13 This comment asks whether or not Alternative 1 was modeled with the San Anselmo Flood Risk Reduction Project and Winship Bridge Replacement Project.

See response to comment C12-11.

C12-14 This comment asks how the baseline hydraulic conditions for Alternative 1 was analyzed if the modeling information reflected in the prior comments is missing.

Floodplain analysis was completed based on hydraulic modeling for both existing conditions and future conditions. Information regarding hydraulic modeling is provided in Section 3.9 on pages 3.9-34 to 3.9-37 in the Draft EIR. Both the existing conditions and

future conditions show reduced flooding because of Alternative 1. The difference between the proposed project and Alternative 1 is discussed further in Master Response 1. The Draft EIR not only meets the CEQA requirements to provide analysis of Alternative 1 as a comparative analysis of impacts of flooding but provides an equal level of environmental impact analysis discussing where Alternative 1 impacts would differ from the proposed project, including an equal level of hydraulic modeling of Alternative 1 and dispersion modeling for Alternative 1 air quality impacts.

C12-15 This comments states that the Chapter 5, Alternatives, in the Draft EIR is flawed if it lacks sufficient information about the alternative to allow a meaningful evaluation and comparison with the proposed project. The comment asks how feasible it would be to incorporate Alternative 1 with fish ladder removal and Unit 4 transition.

CEQA does not require detailed engineering design to determine whether an alternative potentially would be feasible. Presumably, alternatives that would reduce environmental impacts would be feasible under CEQA, unless they would not meet the screening criteria for feasibility, as defined in Chapter 5, Alternatives, in the Draft EIR. The Alternative 1 fish ladder removal, Unit 4 transition, floodwalls, Granton Park stormwater pump station, lower College of Marin concrete removal, and fish pools were all considered to be elements of the proposed project. The difference between the proposed project and Alternative 1 is that the proposed project would include additional construction of a floodplain and natural creek element in Frederick Allen Park, which would not occur in Alternative 1. Because Alternative 1 would be a reduced footprint alternative, logically speaking, constructing Alternative 1 would be feasible because the technology exists. Alternative 1 would be a feasible alternative to the proposed project, as shown in Table 5.2-1 on page 5-7 in the Draft EIR and discussed in Master Response 3.

C12-16 This comment states that Alternative 1 would preserve the existing character of Frederick Allen Park and maintain supercritical flow in the concrete channel. If upstream channel modifications would alter channel conditions, this would create a sub-critical flow within the upper Unit 3 and would be a significant impact on Ross.

The comment is acknowledged. Removal of the fish ladder would substantially reduce the amount of water that is overflowing the Corte Madera Creek channel and flooding the adjacent neighborhood and would increase the amount of water in the channel below the fish ladder under both the proposed project scenario and Alternative 1 scenario. Also see Master Response 1 regarding the preference for Alternative 1.

Supercritical flow is not an ideal hydraulic condition. Supercritical flow involves very fast-moving water that would be hazardous to humans if someone were to fall into the channel during flooding. Consistent with CEQA, the District evaluated changes in water surface elevation and flood risk at structures, to evaluate the proposed project's physical effect on the environment. The proposed project would create subcritical flow in the park, and this condition would be safer for anyone who gets swept into the stream

because they would have a greater chance of being able to exit the creek with the slower flow condition.

C12-17 This comment asks where the discussion and mitigation of supercritical flow impacts are found in the Draft EIR.

The discussion and mitigation of all CEQA-related impacts are presented in Chapter 3 of the Draft EIR and reflect CEQA criteria for evaluation of impacts. See response to comment C12-16 for a discussion of supercritical flow.

C12-18 This comment states that adding flap gates to the drainpipes entering the creek would impact local drainage and residents.

See response to comment A5-26.

C12-19 This comment asks where the discussion and mitigation of impacts related to a flap gate are found in the Draft EIR.

The proposed project would not cause an impact, as discussed in response to comment A5-26. The detailed use of backwater flow presenters is a detail in the design that would not create new impacts or require mitigation separate from the overall project. The use of backwater flow preventers is consistent with the Draft EIR.

C12-20 This comment includes a quotation from page 3.9-42 of the Draft EIR regarding project operation and maintenance activities. The comment states that the newly planted trees would be vulnerable to flood events during the establishment period.

The proposed project would include planting vegetation that would be adapted to the stream environment and resilient to flooding. Vegetation management activities would include replacement of plants if they were affected by flooding and require replacement.

C12-21 This comment asks whether the Town of Ross would be compensated for harm caused by future overbank flooding.

The District would enter into an easement and MOU with the Town of Ross prior to implementing the project in Frederick Allen Park. These agreements would address responsibility to maintain proposed project elements during flooding. See Master Response 1 regarding staff recommendation to adopt Alternative 1.

C12-22 This comment asks what agency would be responsible for immediate and subsequent emergency aid.

The federal agency that would be responsible for emergency aid is FEMA. The Town and the County also would provide local emergency response services.

C12-23 This comment asks what agency would be responsible for cleaning up debris and repairing damages to vegetation and infrastructure.

The responsible party for repairing damage would depend on the location of the damage. Under the proposed project, the District would have a MOU with the Town of Ross and would take on the responsibility for repairing damage to vegetation and infrastructure in Frederick Allen Park, if the proposed project is approved. See Master Response 1 for more information regarding the preference for Alternative 1.

Flooding is an existing condition and the entities responsible for responding to flooding in the area would not change because of the proposed project. Implementation of the proposed project would result in reduction of flooding and would not cause increased risk of damage to vegetation or infrastructure.

C12-24 This comment asks what agency would be responsible to replant and restore the area.

The District would be responsible for vegetation replacement as needed, if the proposed project is approved. See Master Response 1 for more information regarding the preference for Alternative 1.

C12-25 This comment asks who would pay for the proposed project.

Project construction would be funded by District Zone 9 and California Department of Water Resources grant funding. Project maintenance would be paid by the responsible party, as specified in response to comment C12-23. The District has funding (collected through annual revenues from ad valorem property taxes, fees, or, special taxes) to conduct ongoing maintenance of the flood control channel and would continue to conduct this maintenance after project construction is complete.

C12-26 This comment is shown in Table 5.2-1 in the Draft EIR and states that the comments to the 2018 Draft EIS/EIR are incorporated into this comment letter.

The current Draft EIR alternative analysis included previously considered alternatives, including alternative considered in the USACE 2018 Draft EIS/EIR, to provide a comprehensive overview of the alternatives considered for the proposed project and a comparison of the alternatives' ability to meet project objectives. All alternatives that were proposed in the USACE 2018 EIS/EIR were rejected because they were substantially more costly than the proposed project and would result in much greater environmental impacts. These alternatives did not meet CEQA criteria for evaluation in the Draft EIR, as shown in Table 5.2-1.

C12-27 This comment states that the description of Alternative 1 does not match Figure 5.3-8 in the Draft EIR.

The description of Alternative 1 matches the figure showing the alternative, which is Figure 5.3-1 in the Draft EIR. Figure 5.3-1 shows the areas of the proposed project that would be avoided by Alternative 1 and the additional fish pools. The graphic is correct and matches the description. Figure 5.3-8 does not show Alternative 1, but it shows the

difference in model-predicted change in water surface elevation between the proposed project and Alternative 1. Additional details are presented in Master Response 3.

C12-28 This comment includes a partial transcript from the public hearing PowerPoint presentation that was conducted on March 2, 2021, regarding the discussion of a figure shown on slide 37 (Figure 5.3-8 in the Draft EIR). The comment states that texts should match tables and visual presentations in public meetings.

As discussed on page 5-26 of the Draft EIR, Figure 5.3-8 shows that Alternative 1 would result in lower water surface elevation in the creek channel and in the Frederick Allen Park floodplain under a 100-year flood event because the floodplain area would not be constructed in that area. However, residential and commercial areas around Frederick Allen Park would experience reduced flood reduction benefits under Alternative 1. The text on slide 37 of the public hearing PowerPoint presentation also indicated that Alternative 1 would result in less flood risk reduction benefits along Poplar Avenue and along the Unit 4 left bank. Therefore, the texts describing Figure 5.3-8 in the Draft EIR and public meeting presentation match each other.

C12-29 This comment quotes the discussion of geology and soils impacts resulting from Alternative 1. The comment states that the impacts discussion should align with Marin County's Resolution No. 2018-46 regarding seismic impacts of the existing concrete channel.

The impact of the existing conditions would not be an impact of Alternative 1. Alternative 1 would include construction of larger fish pools within the concrete channel. County resolution No. 2018-46 includes no discussion of seismic impacts of the concrete channel. Geotechnical evaluation of the concrete channel and evaluation of the stability of the channel for fish pool construction and the taller floodwalls has been conducted as part of the design process. See response to comment C6-2. The potential impacts of the existing conditions are addressed in the No Project Alternative. See Section 5.3.1 on page 5-14 of the Draft EIR for a discussion of the No Project Alternative.

C12-30 This comment states that proposed larger fish pools should be included in the modeling for alternatives, especially Alternative 1.

The proposed new fish resting pools along the concrete channel are included in the hydraulic modeling analysis. See Master Response 3 and response to comment C6-2.

C12-31 This comment states that the access ramp would breach the existing channel wall in the upper Unit 3 and put the channel stability in question.

The concrete used in the floodwall in upper Unit 3 would be no less stable than the concrete in the access ramp. However, concrete generally is more prone to damage and cracking under strong seismic events than natural soils and vegetation. The access ramp design would be reviewed by USACE engineers as part of the Section 408 process, to

verify the structural stability of the ramp. The access ramp would provide vehicle access to the creek during routine maintenance and sediment removal, which would improve maintenance of the concrete channel. Currently, no access exists to the creek, and workers must access the creek with hand tools. The access ramp would support heavy equipment access to conduct concrete channel repairs in the future, when needed.

C12-32 This comment states that operational reliability should be aligned with Resolution No. 2018-46.

County resolution No. 2018-46 does not discuss operational reliability. The resolution discusses only the transfer of grant funding from Phoenix Lake to the proposed project.

C12-33 This comment states that the Draft EIR should discuss the traffic, noise and air quality impacts from channel and project maintenance associated with the access ramp.

Construction of the access ramp would not be part of the proposed project. Construction of the proposed access ramp would be a categorically exempt project under Section 15303, New Construction or Conversion of Small Structures, under CEQA. The access ramp would have independent utility because it would improve maintenance access to the existing concrete channel. A Notice of Exemption for the access ramp project was filed on March 15, 2021.

C12-34 This comment asks what trees would be removed under Alternative 1.

Alternative 1 would involve the same activities and potential for tree removal as the proposed project in Unit 4, lower Unit 3, and Unit 2. See Table 2.6-2 on page 2-28 and Figures 2.6-2 to 2.6-5 on pages 2-29 to 2-32 in the Draft EIR for details on tree removal in these areas. USACE could require removal of all trees within 15 feet of the concrete channel walls in Unit 3 as part of the Section 408 authorization. While the USACE could require removal of a significant number of trees due to setbacks from the existing floodwall, Alternative 1 construction activities would only require a total of 34 trees to be removed.

C12-35 This comment asks whether replacement trees would be planted in the same area, providing comparable screening and privacy.

As discussed in Section 2.6.9 of the Draft EIR, trees would be planted within proximity of the removal location. Replanting in exactly the same area where trees would be required to be removed by USACE would not be feasible. Tree replacement mitigation would occur off-site, if not feasible to replace trees on site, per Mitigation Measure 3.3-2b in the Draft EIR. Impacts on private views and privacy are not considered under CEQA. See Master Response 4 for a discussion of private views and privacy.

Comment Letter C13

From: Kyle Rosseau <kdrosseau@gmail.com>
Sent: Tuesday, March 16, 2021 1:44 PM
To: cortemaderacreek@marincounty.org
Cc: Kathryn Scalise <kathryn.scalise22@gmail.com>
Subject: Frederick Allen Park - flood mitigation

Hello

I am writing in response to the Frederick Allen Park flood mitigation project in Ross. I live at 45 Poplar Ave. which is directly behind the tennis courts in Frederick Allen Park. While I support flood mitigation efforts from the town and city I am opposed to excessive clear cutting of the trees in Frederick Allen Park. These trees provide us with privacy so that people walking behind our house cannot see into our property. I know our neighbors also appreciate the privacy these trees provide. Additionally I am concerned with the environmental habitat this project will harm/disturb. I am told there is an alternative (1) that doesn't impact as many or any of the trees. I would be in support of this. C13-1 C13-2

Thanks
Kyle Rosseau.
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- KR
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2.5.1 Response to Letter C13: Kyle Rosseau

C13-1 This comment states that the commenter supports flood mitigation projects but is opposed to tree removal in Frederick Allen Park and loss of privacy to nearby residences.

This comment is acknowledged. Tree removal will be limited to the extent required by regulations or to facilitate project construction. No unnecessary tree removal is proposed. Trees removed in Frederick Allen Park will be replaced with trees and other vegetation. The impacts on views following landscaping and at approximately 10 and 20 years after landscaping are shown in Figures 3.1-13 and 3.1-14 in Section 3.1, Aesthetics, in the Draft EIR. Private views and privacy are not considered to be an impact within the context of CEQA. See Master Response 4 for further discussion.

C13-2 This comment expresses concerns about proposed project impacts on habitat in Frederick Allen Park and states that the commenter supports Alternative 1.

Frederick Allen Park is a landscaped park. The existing vegetation in the park is not a natural habitat. See Master Response 6 regarding the existing habitat conditions and proposed improvements in Frederick Allen Park.

The commenter's support for Alternative 1 is acknowledged. See Master Response 1 regarding staff recommendation to adopt Alternative 1.

Comment Letter C14

Ben and Kristen Swann
Post Office Box 322
Ross, California 94957
kcadz@aol.com

Hugh and Luanne Cadden
Post Office Box 1198
Ross, California 9495
hjcadden@gmail.com

Via Email Only - cortemaderacreek@marincounty.org

March 17, 2021

Marin County Flood Control and Water Conservation District

Attn: Joanna Dixon, PE

Re: Corte Madera Creek Flood Risk Management Project, Phase 1 Draft Environmental Impact Report (DEIR).

The following are our Comments relating to the February 1, 2021 Corte Madera Flood Risk Management Project, Phase 1 Draft Environmental Impact Report (DEIR). As indicated, the analysis of the proposed Project in the DEIR is not adequate to allow the public to review and understand the scope of the Project's potential impacts and provide suggestions regarding mitigation measures or alternatives that might lessen those impacts. C14-1

Comment 1. Offsite Impacts of Frederick Allen Park Floodplain on the Adjacent SFDB Properties. The properties located at 1 SFDB, 3 SFDB, 11 SFDB and 15 SFDB are at ground zero in terms of construction and operations of the Frederick Allen Park floodplain project and are directly and significantly impacted by the proposed floodplain park. Yet there is no analysis of the offsite impacts on these properties. The DEIR must be revised to acknowledge the offsite environmental impacts on the SFDB properties as significant and unavoidable and to include an analysis of the offsite environmental impacts on these properties and mitigation proposals. The significant impacts include but are not limited to, the following: (i) Aesthetic and Visual impacts relating to the removal of the tree canopy and habitat including the loss of privacy; loss of screening and shade; and loss of outdoor land use. (ii) Hydrology impacts including impairment to storm drainage resulting in backwater effect and stormwater ponding and/or sheetflows on the SFDB properties. (iii) Health and Safety impacts including possible trespassing, heightened risk of burglary due to complete loss of privacy; and the risk of homeless encampments that cannot be removed from public property. (iv) Land Use impacts including the inability to reside in our home and the loss of quiet enjoyment of our property both inside and outside due to the magnitude, nature and proximity of the Project construction. C14-2 C14-3 C14-4 C14-5 C14-6

Comment 2. Vehicle Trips and Access Routes. 3.13-8. Construction vehicle trips and access routes for Frederick Allen Park will be on an "informal path within the District's easement on the left bank." 3.13-8. The DEIR does not identify the parcels that will be impacted. The easement is not adequately described making it impossible for the SFDB property owners to determine if their property is impacted and to what extent. The DEIR needs to identify the parcels affected by address or parcel number and provide a legal description of the easement

C14-7

Comment 3. Storm Drainage System Impact. On page 3.9-9 under the section Storm Drainage System, the mechanism by which stormwater runoff collects from drainage areas throughout the watershed and is routed by the municipal storm drain system into the channel will be compromised by the increase in water surface elevation within the proposed project channel causing a backwater effect and stormwater either ponds and/or sheetflows overland in the drainage areas. The DEIR expressly states at 3.9-9 that it does not address this mechanism. The resulting backwater and sheetflow effects are significant impacts that directly impact the Town of Ross storm drainage system and numerous properties including the SFDB properties. Without this information and analysis it is impossible to understand the scope of the Project's potential impacts and provide suggestions regarding mitigation measures or alternatives that might lessen those impacts.

C14-8

Comment 4. Fiscally Responsible. It is impossible to determine whether the Project is fiscally responsible because there is no information regarding the Project budget, funding or costs. Fiscal responsibility is a stated objective in the DEIR and it is stated that the Project can be accomplished with local and reasonably foreseeable grant-funding opportunities. 2-8. Yet the DEIR is silent. Without some level of budget, funding or cost information it is impossible to determine the feasibility of the Project and the environmental, social and ecological impact if only the Frederick Allen Park portion of the project is completed or worse yet if it is started and not completed. Further, without some level of budget, funding and cost information it is impossible to evaluate and compare the cost benefits of the Project and Alternative 1. 5-3, 5-4

C14-9

C14-10

Comment 5. Objective 3 is misleading and constitutes a material misrepresentation. One of the principal Project objectives defined in the DEIR is "Objective 3. Public Access and Enhanced Recreational Experience. Maintain public access along the creek via the multi-use path **and enhance the recreational experience and amenities along the creek corridor to meet the Town of Ross and Kentfield area community needs.**" 2-7 There is no factual or record basis that the Town needs to enhance the recreational experience and amenities along the creek corridor. This is simply not true. The Town of Ross has no such need and there is no public record that it has determined that there is such a need. The statement that it does is false and misleading and will affect the public's evaluation of the Project and Alternative 1 which does not include the floodplain park. This Objective must be corrected and the DEIR must be recirculated.

C14-11

Recirculation of an EIR prior to certification is required when "the draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment are precluded." As discussed above, the DEIR is so fundamentally and basically inadequate that recirculation of a new DEIR is required to allow the public to meaningfully review and comment on the Project. C14-12

Sincerely,
Hugh and Luanne Cadden
Ben and Kristen Swann

cc: towncouncil@townofross.org
jchinn@townofross.org

2.5.2 Response to Letter C14: Hugh Cadden, Luanne Cadden, Ben Swann, and Kristen Swann

C14-1 This is a summary comment purporting that the Draft EIR does not provide adequate impacts analyses for the public to understand the scope of project impacts and to provide comments on project mitigation measures and alternatives.

Chapter 3 of the Draft EIR provides a thorough analysis of the project's impact, including mitigation measures and alternatives. The Draft EIR analysis fulfills CEQA requirements.

C14-2 This comment states that the Draft EIR does not include discussion and analysis of construction impacts on adjacent properties along Sir Francis Drake Boulevard.

The Draft EIR addresses direct and indirect impacts of project construction in Frederick Allen Park throughout Chapter 3. The air quality impact on adjacent properties is discussed under Impact 3.2-3 on pages 3.2-26 to 3.2-30 in the Draft EIR, stating that short-term health risk impacts on sensitive receptors (see Figure 3.2-2 in the Draft EIR for sensitive receptors considered in the analysis) would be mitigated to a less-than-significant level with implementation of Mitigation Measure 3.2-3. This mitigation measure would require all off-road -diesel powered- construction equipment to be equipped with engines that meet USEPA or Carb Tier 3 off-road and Diesel Particulate Filter level 3 emission standards.

Impacts of project construction noise and vibration on adjacent properties are discussed under Impacts 3.10-1 and 3.10-2 on pages 3.10-15 to 3.10-24 in the Draft EIR. The noise and vibration impacts on sensitive receptors (see Figure 3.10-3 in the Draft EIR for sensitive receptors considered in the analysis) during project construction would be mitigated to a less-than-significant level with implementation of Mitigation Measures 3.10-1 and 3.10-2. This would include noise reduction measures such as adding sound walls and avoiding intense vibration in proximity to structures.

C14-3 This comment states that the proposed project's significant impacts related to aesthetic and visual resources are removal of tree canopy and habitat, loss of privacy, loss of screening and shade, and loss of outdoor land use.

As discussed in Section 3.1 in the Draft EIR, the only significant and unavoidable impact related to aesthetics and visual resources would be the temporary impact on visual quality while the trees are establishing. The impact on private views is not considered to be an impact within the context of CEQA, and thus it is not discussed in the Draft EIR. Loss of shade is addressed under Impact 3.12-3 and Mitigation Measure 3.12-3 in Section 3.12 in the Draft EIR. This mitigation measure would require planting larger trees and installing shade structures, which would reduce the temporary impact from reduced shade to a less-than-significant level. The park would continue to be a public park, and the proposed project would not change the land use.

C14-4 This comment states that hydrology impacts would include impairment to storm drainage, resulting in a backwater effect and stormwater ponding and/or sheet flows on Sir Francis Drake Boulevard.

See response to comment A5-26 regarding the use of backflow prevention and the reduction in flood inundation because of the reduction in Corte Madera Creek overtopping. The proposed project also would include a stormwater pump station in the Granton Park neighborhood, to improve stormwater drainage to Corte Madera Creek.

C14-5 This comments states that impacts related to health and safety would include trespassing, heightened risk of burglary related to loss of privacy, and the risk of homeless encampments.

Potential impacts on public services are addressed in Section 3.11 in the Draft EIR, which states that impacts on fire and police services, schools, parks, and other public facilities would be less that significant. Potential impacts from increased trespassing and burglary are speculative and would not be direct or indirect impacts related to project activities. Trespassing and burglary are unlawful and would not become lawful because of the project. Furthermore, the proposed project would not create a new land use.

C14-6 This comments states that impacts related to land use would include an inability to reside in homes and loss of quiet enjoyment because of project construction.

The proposed project would not affect anyone's ability to reside in their home. The duration of construction noise and vibration impacts, and proposed mitigation measures are discussed in Section 3.10 in the Draft EIR. Also see response to comment C14-1.

C14-7 This comment states that the Draft EIR does not identify the parcels that would be affected by using the informal path on the left bank during project construction. The comment suggests that the Draft EIR should identify the parcels or parcel numbers affected by the use of the informal path on the left bank and provide a legal description of the proposed easement.

The reference to the informal access path on the left bank is taken out of context. The only access shown in Frederick Allen Park is via public roads and along Bike Route 20. See Figure 2.6-6 of the Draft EIR for proposed project access routes. As shown in this figure, no access would occur from the left bank. The informal path on the left bank refers to the informal path within the District's easement along the proposed floodwall segments in lower Units 2 and 3.

C14-8 This comment states that stormwater runoff that is collected from drainage areas throughout the watershed and routed by the municipal storm drain system into the channel would be compromised by the increase in water surface elevation and cause a backwater effect. The backwater effect is not discussed in the Draft EIR and would have a significant impact on the Town of Ross. Without information and analysis of this topic,

understanding the scope of proposed project impacts and providing suggestions for mitigation measures and alternatives is not possible.

See response to comment A5-26. Section 3.9 in the Draft EIR presents a detailed analysis of hydraulic impacts and flood model results.

C14-9 This comment states whether or not the proposed project would be fiscally responsible if no information is provided regarding the project budget, funding or cost is impossible to determine.

The proposed project would meet criteria for being fiscally responsible because it could be accomplished with the existing grant funding and funding available through District Zone 9 fees. Cost is not an impact in the context of CEQA. The consideration of cost within the context of CEQA analysis is included in Chapter 5, Alternatives, in the Draft EIR, when analyzing the economic feasibility of an alternative to the proposed project. See also Master Response 5.

C14-10 This comment states that evaluating and comparing the cost benefits of the proposed project and Alternative 1 is impossible without information about project cost and budget.

A cost benefit analysis is not required under CEQA. See Master Response 5 for a discussion related to this topic.

C14-11 This comment states that the Town of Ross has no need to maintain public access or enhance the recreational experience along the creek, and thus no factual basis exists to support the project objectives of maintenance of public access and enhanced recreational experience. The comment requests for the project objectives to be corrected and the Draft EIR to be recirculated.

The District is the proponent and lead agency for the proposed project. The District has the authority to determine project objectives for its own project. The project objective of enhanced recreational experience is consistent with one of the objectives of the grant from the California Department of Water Resources. The project would maintain access along Bike Route 20 and would enhance recreational opportunities in Frederick Allen Park and the Lower College of Marin project area. Implementation of the proposed project would meet the public access maintenance and enhanced recreational experience objectives.

C14-12 This comment states that the Draft EIR is fundamentally and basically inadequate and recirculation of a new Draft EIR is needed.

The Draft EIR meets the requirements of CEQA and includes substantial evidence for each of the impact conclusions. See responses to comments C14-1 to C14-10. Also see Master Responses 1 regarding CEQA and when recirculation is required.

Comment Letter C15

From: Jon Child <child.jon@gmail.com>
Sent: Wednesday, March 17, 2021 8:42 PM
To: cortemaderacreek@marincounty.org
Subject: Concern regarding Corte Madera Creek project

To Whom it May Concern,

After reviewing the recently released EIR report and observing the number of trees slated for removal in Frederick Allen Park, we wanted to voice our concern and opposition to destruction of Allen Park. C15-1

We reside at 29 Poplar Ave, in Ross which is the center of the proposed project, and while we are supportive of flood mitigation, our primary concern is how the revised plans differ dramatically from earlier iterations. C15-2

The removal of all trees, aka clear cut and replanting suddenly turns this into a 10-15 year project for residents like ourselves. In addition, the design of the path appears to no longer be at a lower elevation as originally described, negating any sense of privacy, and is now within 10 feet of our backyard. C15-3 C15-4

Again, we are supportive of plans to address flooding in the area, but care deeply about privacy. the habitat and the short, medium and long-term effects on our neighborhood. C15-5

Tyler and Jon Child

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1

2.5.3 Response to Letter C15: Tyler Child and Jon Child

C15-1 This comment expresses opposition to project elements in Frederick Allen Park.

The comment does not address the adequacy or accuracy of the Draft EIR. See Master Response 1 regarding the preference for Alternative 1.

C15-2 This comment expresses support for a flood mitigation project and also expresses concerns about how dramatically different the proposed project would be from the 2018 USACE project.

The proposed project would be different from the previous projects proposed by USACE. The proposed project has been designed in response to public comments on the USACE 2018 Draft EIS/EIR, including public comments during meetings that were held in June 2020. The proposed project would be consistent with the proposal as presented at the June 2020 meetings, during the Draft EIR scoping meeting, and in the NOP presented in September 2020, but the Draft EIR includes greater details describing the project elements.

C15-3 This comment states that removing trees and planting new ones would increase the project time frame to 10 to 15 years because it would take time for the trees to mature.

The removal of trees in Frederick Allen Park would be necessary to accommodate construction of the riparian habitat, natural channel, and floodplain. The newly planted trees and vegetation would grow at different rates. Although new vegetation would be present immediately after project construction is completed, tree and canopy growth to a level similar to existing conditions would take 10 to 20 years, as discussed in Section 3.1 in the Draft EIR.

C15-4 This comment states that the design of the path in Frederick Allen Park has changed and no longer appears to be at a lower elevation. The comment also states that the path now is within 10 feet of the commenters' backyard.

The project path in Frederick Allen Park would be at a lower elevation and within the confines of the existing park, where public access trails are found. The pathway proposed in Alternative 2 would be at a higher elevation and closer to properties along the edge of the park, to reduce the frequency of flooding of the pathway and maintain more naturalized area along the creek. See Master Response 1 regarding preference for Alternative 1.

C15-5 This comment supports flooding mitigation projects and expresses concerns about adverse impacts related to privacy and habitat, as well as to short and long-term impacts on the neighborhood.

As discussed in Chapter 2, Project Description, and Section 3.3 in the Draft EIR, the project improvements in Frederick Allen Park would provide benefits for habitat (also see Master Response 5). The area where the proposed pathway would be relocated is

within the confines of the existing park, which includes existing public access and pathways.

Impacts on privacy are not considered to be environmental impacts in the context of CEQA. See Master Response 4 for further discussion.

Comment Letter C16

Beth Foster and Paul Furusho
19 Sir Francis Drake Boulevard
Ross, California 94957

March 17, 2021

Marin County Flood Control and Water Conservation District
ATTN: Joanna Dixon
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903

Re: Comments from 19 Sir Francis Drake Blvd., Ross, CA 94957 on the Marin County Flood Control and Water Conservation District Corte Madera Creek Flood Risk Management Project, Phase 1 Draft Environmental Impact Report

Dear Ms. Dixon and members of the Marin County Flood District Board:

Thank you for the opportunity to provide comments regarding the Corte Madera Creek Flood Risk Management Project, Phase 1 (the Project) Draft Environmental Impact Report (DEIR) dated February 2021. We live at 19 Sir Francis Drake Boulevard (SFDB), a property that is bounded to the northeast by SFDB and which runs along and extends into the concrete channel portion of Corte Madera Creek that is discussed in the Project. The fish ladder referenced in the document is at the upstream end of our property. As such, we are directly impacted by the Project. C16-1

This letter supplements verbal comments I (Beth Foster) provided during the March 2 County Board of Supervisors hearing. Generally, we believe it is imperative that the Ross Valley community address the potential for flooding along Corte Madera Creek, and we appreciate that our property may potentially benefit from reduced flood risk with implementation of the Project. We would like to see some version of the Project proceed. However, we are concerned about some of the impacts to our property that would result. Our primary concerns pertain to the aesthetic impact of the removal of vegetation on and adjacent to our property as well as the potential associated reduction in property value. C16-2 C16-3

Following are specific comments or requests for clarification by section on the DEIR document:

- Section 2.4 *Project Objectives*, Objective 3. Public Access and Recreational Quality states "Maintain public access along the creek [...] and enhance the recreational experience and amenities along the creek corridor to meet Town of Ross and Kentfield area community needs." We request the Project design allow access to the creek corridor from our property via a gate in the fence. We believe this would be in keeping with project objective #3, allowing us to benefit from the Project. C16-4

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- Fig. 2.5-1 *Project Elements (Map 1 of 3)*, identifies the alignment of proposed retaining walls downstream of the existing fish ladder location. We request additional information regarding the height and appearance of the retaining walls as well as their location relative to the existing concrete wall along the left bank so that we may understand their aesthetic impact on our property and where construction activities will occur. C16-5
- Fig. 2.6-1 *Staging, Stockpile, and Temporary Work Areas*, identifies the Flood District-owned property adjacent to our home as a staging area. In section 2.6.2 *Site Preparation*, it says that "Vegetation within the staging and stockpiling areas would be trimmed and removed, …". Fig 2.6-2 *Tree Removal Unit 4 and Frederick Allen Park*, labels the majority of trees in this staging area as "Tree to Remain." Please address this discrepancy and confirm that trees will not be removed within this staging area. C16-6
- Fig 2.6-2 *Tree Removal Unit 4 and Frederick Allen Park*, depicts the removal of all of the trees behind our house along the channel (due to the 15' Army Corps of Engineers clearance requirement). These trees comprise the view from our home, and they screen the view of the existing chain link fence and channel. We also frequently observe hummingbirds, osprey, and other wildlife enjoying them. The DEIR contends in Section 3.1 *Aesthetics and Visual Resources* that visual quality impacts from tree removal will be temporary because many removed trees will be replanted, but this does not apply to those trees that are proposed to be removed along our property. We assert that the tree removal will have a significant, adverse aesthetic impact as well as an impact to our property value. While it is stated on page 3.1-21 that "impacts on private views are not required to be considered under CEQA," we request that our concerns be considered. C16-7
- Section 3.10 *Noise*, states that "grading and heavy equipment use would last up to seven months" in the area near our home. We are concerned about the impacts of construction noise and vibration on our quality of life and the potential disruption in our ability to work during the day. We request that all possible noise mitigation efforts be made to minimize these impacts and that residents be kept very well informed about planned activities. C16-8
- Lastly, we request that section 3.9 *Hydrology and Water Quality* address overland stormwater flow and measures that will be taken to mitigate the significant amount of water that drains across SFDB toward the creek as well as through a large swale that runs through our backyard, and the backyards of our neighbors. C16-9

Thank you for your consideration of these comments. We are hopeful that we will have the opportunity to work with the Flood District to better understand how the Project will be specifically implemented on and adjacent to our property as more detailed design is completed prior to construction so that we can minimize any detrimental impacts. We are grateful for the efforts to date in seeking input from stakeholders, and we look forward to continued collaboration as the Project progresses. C16-10

Very sincerely,
Beth Foster
Paul Furusho

cc: Joe Chinn, Ross Town Manager
Richard Simonitch, Ross Public Works Director

2

2.5.4 Response to Letter C16: Beth Foster and Paul Furusho

C16-1 This comment states that the fish ladder proposed to be removed is at the upstream end of the commenters' property. Thus, the commenters would be directly affected by the proposed project.

The Draft EIR presents impacts analyses related to the fish ladder removal in Chapter 3. See Draft EIR Section 3.1 (starting from page 3.1-24) for a discussion of aesthetic impacts, Section 3.3 (starting from page 3.3-56) for a discussion of biological impacts, Section 3.9 (starting from page 3.9-39) for a discussion of hydrology and water quality impacts, and Section 3.12 (starting from page 3.12-9) for a discussion of recreation impacts.

C16-2 This comment supplements a verbal comment made during the public hearing that were held on March 2, 2021. The comment states that the commenters appreciate the potential flood reduction benefits from the project, but it also expresses concerns about potential impacts on property.

See Master Response 4 and Master Response 5 regarding consideration of impacts on private views and impacts on property value under CEQA.

C16-3 This comment expresses concerns about aesthetic impacts from vegetation removal and the potential impact associated with reduction in property value.

The proposed project would include plantings in the Frederick Allen Park, including understory vegetation with shrubs and grasses as well as trees to minimize aesthetic impacts resulting from vegetation removal. See Section 2.6.9 in the Draft EIR regarding revegetation and landscaping of the park. Property value is generally (unless it can be shown to cause a physical impact due to a direct chain of cause and effect) not an environmental impact in the context of CEQA. See Master Response 5 for further discussion.

C16-4 This comment requests that the District allow access to the creek bottom from the commenters' property.

As indicated in Master Response 1, the District staff is recommending adoption of Alternative 1 because of Town of Ross's preference for Alternative 1. Access to the creek from private property is not a consideration for the EIR.

C16-5 This comment requests additional information regarding the height and appearance of the retaining walls as well as the locations in relation to the existing concrete wall along the left bank.

The location of the retaining walls and floodwalls on the left bank within the Frederick Allen Park reach are shown in Figure 2.5-4 in the Draft EIR. The height of the floodwalls would be up to 10 feet tall, to match the existing concrete channel height, but would taper down to a shorter elevation and would not extend above the existing concrete channel walls. The retaining walls would be 2 feet tall and would extend 2 feet above

grade, as discussed on page 2.16 in the Draft EIR. Additional visual simulations of the retaining and floodwalls are shown in response to comment A5-20.

C16-6 This comment points out a discrepancy between the description of vegetation removal in Section 2.6.2 and tree removal shown in Figure 2.6-2 in the Draft EIR.

The District's intent would be to minimize tree removal. Although Section 2.6.2 in the Draft EIR describes a conservative scenario for tree removal to address USACE vegetation setbacks from floodwalls, tree removal in the staging and stockpiling area currently is not anticipated. However, between the District gate and the concrete channel wall, trimming may be required as needed to provide clear access to the channel.

C16-7 This comment states that all trees behind the commenters' property would be removed, per USACE's 15-foot clearance requirements, and that replanting at the same location is not proposed in the Draft EIR. The comment requests that impacts on private views and property values be considered as part of CEQA analysis.

See responses to comments B1-17 and C5-11. USACE may not require removal of tress on the District's property because the proposed floodwall would be attached to the existing floodwall. See Master Response 4 for discussion of impacts to private views and Master Response 5 regarding impacts to property values.

C16-8 This comment expresses concerns about noise and vibration impacts on adjacent properties and requests mitigation to minimize these impacts.

Potential project impacts from noise and vibration are discussed in Section 3.10 in the Draft EIR. The District would implement Mitigation Measure 3.10-1, which would require preparation and implementation of a noise reduction plan, including notification of nearby residents and use of noise barriers to reduce noise levels at adjacent residences. Vibration impacts would be addressed by implementation of Mitigation Measure 3.10-2, which would require vibration monitoring in proximity to structures during construction activities in Frederick Allen Park, and also would require prior notification to residents of upcoming vibration-generating activity. As described in Section 3.10 in the Draft EIR, the proposed project would result in less-than-significant noise and vibration impacts on adjacent residences with implementation of mitigation measures.

C16-9 This comment requests that the Draft EIR address impacts and describe mitigation measures related to overland stormwater flow.

Localized flooding from overland and residential areas is outside the District's jurisdiction and is the responsibility of the Town of Ross. The District is responsible for addressing flood risk reduction on Corte Madera Creek. See also response to comment A5-26.

C16-10 This comment states that the commenters look forward to working with the District as the proposed project progresses.

The commenter's desire to work with the District is acknowledged.

Comment Letter C17

From: ArleneF@Yahoo.com <arlenef@yahoo.com>
Sent: Wednesday, March 17, 2021 7:22 AM
To: Corte Madera Creek <cortemaderacreek@marincounty.org>
Cc: Kevin Haroff <kharoff@cityoflarkspur.org>; dhillner@cityoflarkspur.org
Subject: Comments re. Draft EIR - Corte Madera Creek Flood Risk Management Project

Attn: Joanna Dixon
Project Manager

Re. Draft EIR
Corte Madera Creek Flood Risk Management Project
Marin County Flood Zone 9

As residents of Larkspur, we are very concerned that the proposed project alternatives, upstream of our town, will continually increase the accumulation of sediment from Bon Air Bridge to College of Marin (CoM), near College Avenue. C17-1

Currently, there is massive accumulation of mud, referred to by the County and others as "the plug", just past the southern end of the existing concrete channel and east of the CoM football/soccer field. It is believed that this "plug" is a result of a drop in water velocity as the sediment-laden flow transitions from a fast moving, deep, and narrow channel to a broader, shallower area. If part or all of the concrete channel is removed, even more sediment will accumulate upstream of Bon Air Bridge reducing the capacity and volume of the drainage channel over time to handle all of the runoff. This puts the residents downstream at even more risk, especially since dredging has ceased for many decades. C17-2

An analogy, perhaps, can help. Suppose a person decides to take a bath and fills the tub just shy of it overflowing. Then, every month, a gallon of mud is added to the bath because mud baths are now in vogue. But, because one does't want the hassle of emptying and cleaning the tub each time, the mud is left. Next bath, another gallon of mud and the same volume of water is added as before. At some point the water spills over and one has a horrible mess.

We ask you to please give serious consideration to the future ramifications of sediment accumulation and water rise as a result of the proposed project alternatives. C17-3

Thank you,

Arlene Fox & Stephen Whitcomb
Hillview neighborhood
Larkspur, CA

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2.5.5 Response to Letter C17: Arlene Fox and Stephen Whitcomb

C17-1 This comment expresses concerns that the proposed project would increase accumulation of sediment from Bon Air Bridge to the College of Marin, near College Avenue.

Project impacts on sedimentation or erosion are discussed in Section 3.9 in the Draft EIR. The proposed project would not cause a significant increase in sediment transport or sedimentation from Bon Air Bridge to the College of Marin. See Impacts 3.9-1 and 3.9-2 on pages 3.9-39 to 3.9-51 in the Draft EIR for the discussion of project impacts related to erosion and sediment transport. Sediment deposition at the earthen channel in Units 1 and 2 currently is from a combination of fluvial and coastal sediment input. The proposed project would not result in a significant change in watershed-scale fluvial sediment sources, transport, or deposition.

C17-2 This comment summarizes the existing sedimentation condition near Bon Air Bridge and states that more sediment would accumulate upstream from the bridge and would put the residents downstream at greater risk if all of the concrete channel is removed.

As explained in response to comment C17-1, the proposed project would not cause a significant increase in sedimentation and would not cause more sediment to accumulate. As discussed in Chapter 2, Project Description, in the Draft EIR, sediment controls measures would be implemented, including installation of buried rock, erosion control fabric, and engineered streambed material, and the natural creek channel would be restored with riparian vegetation in Unit 4 and Frederick Allen Park, to prevent increased sedimentation downstream. See Section 2.5.3 on page 2-14 in the Draft EIR for more information regarding project elements in each unit.

The District staff is recommending adoption of Alternative 1, which would not include removing the concrete channel in Frederick Allen Park, as discussed in Master Response 1.

C17-3 This comment requests that the District consider the future ramifications of sediment accumulation and water rise based on the proposed project alternatives.

See responses to comments C17-1 and C17-2.

Comment Letter C18

Charles Goodman

PO Box 1325

20 Sylvan Lane

Ross, CA 94957

Joanna Dixon, P.E.
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903

March 15, 2021

Dear Joanna,

There are several issues that need to be addressed in the EIR/EIS, especially #1, which was not addressed previously.

1. Transportation, Noise: The County must address sediment removal.
   "This study's uncalibrated sediment budget estimates that the Corte Madera Creek Watershed supplies about 7,250 tons of bedload each year to the reach above Ross. The calibrated Parker-Klingerman sediment transport model estimated average bedload sediment inflow at Ross is about 6,750 tons/year. Using an average of the two results, the study estimates that about 7,000 tons/year of bedload are delivered to Ross, or about 450 tons/sq. mi. /year."
   Source: Geomorphic Assessment of the Corte Madera Creek Watershed, final report.
   You did not answer my question about Sediment and Debris Removal in the Draft EIR. You referenced section **2.7.2 Maintenance** of the Draft EIR which lists Sediment and Debris Removal as item #2, on page 2-42, but on page 2-43, only Sediment and Debris Removal **from Fish Pools** is described; Sediment and Debris Removal as it relates to the entire project is non-existent. There is a sediment basin at Fred Allen Park that would need to have Sediment and Debris removed on a regular basis for the health of the creek and the wildlife that lives in it.
   How does the County plan to mitigate this substantial disruption of sediment removal from the creek within the Town of Ross? The town is currently protected from floods up to 100-year levels. The proposed project would remove an existing concrete channel and expose the dirt on the sides and bottom, which in turn will be subject to erosion and to becoming sediment that will then need Regular Maintenance in the form of Sediment and Debris Removal. **Page 3.9-48 of the Draft EIR states a Significance Determination of 'Less than Significant' in regards to both Construction & Operation & Maintenance.** This just defies common sense.

C18-1

Page 1 of 2

2. Trees: The tree issue is not adequately being mitigated. Twenty years to replace the canopy is too long and unreasonable. C18-2

3. Aesthetics and Visual Resources: All plans, except the "'no plan", show work upstream of the fish ladder. All information is vague.
Please provide explanation regarding: creek bank walls, height limits of walls, lower creek bottom depth, widening of Lagunitas Road Bridge C18-3

4. Hydrology and Water Quality: What is current level of flood cfs and year level of protection at Lagunitas Bridge. What is the level of flood cfs and year level of protection when completed? C18-4

5. Hydrology and Water Quality: The area from the Winship Bridge to the Lagunitas Road Bridge has been left out of this analysis, flawing your whole project. You are adding cfs at Winship Bridge and cause my house and others on Sylvan Lane to flood. Ross creek will not handle additional flows. C18-5

6. Land Use and Planning: The County has failed to account for any overland water flows from Bolinas Ave, Fernhill, Southwood, Norwood, Ames, or Lagunitas Road. There is no plan to capture or move this water. C18-6

7. You continually ignore the "do no harm" rules of FEMA by submitting project plans that will result in causing additional flooding and flooding in areas that did not flood before. C18-7

Regards,

Charles Goodman

Charles Goodman

2.5.6 Response to Letter C18: Charles Goodman

C18-1 This comment states that the Draft EIR did not address the issue related to sediment and debris removal from the Corte Madera Creek channel in the Town of Ross. The comment also asks how the District plans to mitigate the disruption to the community related to sediment removal from the creek within the Town.

Existing sediment deposition from upstream sediment sources in Corte Madera Creek in the Town of Ross is part of the existing condition and would not be affected by the proposed project. The proposed project would not cause increased sedimentation from the upper watershed into the Town. The natural channel in Frederick Allen Park was designed to approximate a natural bank full geometry, which would minimize sediment deposition and erosion in the restored Frederick Allen Park reach of Corte Madera Creek. See Master Response 1 regarding the preference for Alternative 1.

C18-2 This comment states that tree removal would not be mitigated adequately, and that waiting 20 years for the tree canopy to be replaced would be an unreasonable wait time.

See response to comment A5-3. The tree mitigation includes planting with trees that are the largest size available. The Draft EIR includes all feasible mitigation and states that the impact would be significant and unavoidable for up to 10 years, while the canopy is establishing. See also Master Response 1 regarding staff recommendation to adopt Alternative 1.

C18-3 This comment states that all the information in the Draft EIR is vague and requests an explanation regarding creek bank walls, height limits of walls, lower creek bottom depth, and the widening of Lagunitas Road Bridge.

See response to comment C11-11. The creek bank would not be widened at Lagunitas Road Bridge.

C18-4 This comment asks about the current level of flood in cubic feet per second, the level of protection at Lagunitas Road Bridge, and the future level of flood protection at Lagunitas Road Bridge after project construction is completed.

Current flood flows and channel capacity in the project area are discussed in Section 3.9 of the Draft EIR (starting from page 3.9-12). As indicated in the Draft EIR, the standard project flood discharges were estimated to be 7,500 cubic feet per second for Corte Madera Creek in the project area. Channel capacity in the section of Corte Madera Creek between Lagunitas Road Bridge and the concrete channel ranges from about 3,300 to 4,000 cubic feet per second based on recent observations of when flow levels exceeded channel capacity and went overbank. The proposed project would not include any improvements or work at Lagunitas Road Bridge. The proposed project would not change the creek conveyance capacity at Lagunitas Road Bridge.

C18-5 This comment states that the area between Winship Bridge and Lagunitas Road Bridge is not included in the hydrology and water quality analysis in the Draft EIR. The comment says that the proposed project would add more flow at Winship Bridge and would cause properties on Sylvan Lane to flood.

The hydrologic impacts of the proposed project are analyzed in detail in Section 3.9 in the Draft EIR, including potential impacts on existing hydrologic conditions in Corte Madera Creek, potential impacts on future conditions after implementation of upstream projects including Winship Bridge, and potential impacts with moderate and high projections for sea-level rise. See page 3.9-34 in the Draft EIR for a discussion of the approach to the impact analysis. See Impact 3.9-5 starting on page 3.9-54 in the Draft EIR for a discussion of the detailed analysis of potential impacts on the existing flooding condition, future condition, and sea-level rise. The analysis and associated maps of flood inundation and water surface elevations in Appendix E in the Draft EIR show that the proposed project would result in reduced flooding on Sylvan Lane.

C18-6 This comment states that the District fails to address overland water flow impacts in the Draft EIR.

Localized flooding from overland and residential areas is outside the District's jurisdiction and is the responsibility of the local jurisdiction, including the Town of Ross. The District is responsible for addressing flood risk reduction of Corte Madera Creek.

C18-7 This comment states that the District ignores the "do no harm" rules of FEMA, and that the proposed project would result in additional flooding in areas that did not flood previously.

The District would comply with all FEMA requirements when implementing the proposed project. As shown in Figures 3.9-7 to 3.9-9 on pages 3.9-55 to 3.9-57 in the Draft EIR, the proposed project would not result in any significant adverse flood impacts and would result in significant flood reduction benefits. As shown in Table 2.8-1 in the Draft EIR, the District would obtain FEMA approval for the proposed project.

Comment Letter C19

From: littledan@hotmail.com <littledan@hotmail.com>
Sent: Monday, March 22, 2021 11:43 AM
To: Dixon, Joanna <JDixon@marincounty.org>
Subject: Corte Madera Creek - Frederick Allen Park Flood Risk Management Project

Dan Little would like information about:
Hi Joanna,
I am a resident of Ross and live on Sylvan Lane along the creek. I would like to write in support of the proposed Corte Madera Creek Flood Risk Management Project near Frederick Allen Park. I have a family with young children and believe the new park will benefit families as an additional public natural space near town. I also think the threat of flooding will persist and we need to do everything we can to mitigate the risk given the more volatile weather conditions we have seen in recent years. I understand that the tree removal may impact some in the short term, but given that new trees will be planted, I think the long term benefits outweigh the shorter term challenges. Please let me know if I can be of further help.
Best,

C19-1
C19-2
C19-3

Dan Little
18 Sylvan Lane
Email Disclaimer: https://www.marincounty.org/main/disclaimers

You're receiving this message because you're a member of the Corte Madera Creek group from County of Marin. To take part in this conversation, reply all to this message.

View group files | Leave group | Learn more about Microsoft 365 Groups

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2.5.7 Response to Letter C19: Dan Little

C19-1 This comment expresses support of the proposed project and states that families would benefit from additional public natural space near the Town of Ross.

The support for the proposed project acknowledged. See Master Response 1 regarding lack of Town of Ross' support of the proposed project and the preference for Alternative 1.

C19-2 This comment states the risk of flooding would persist after implementation of the proposed project because of increasing volatile weather conditions, and also states the need to do everything possible to mitigate the risk.

The comment addresses the merits of the project and not the environmental impact analysis.

C19-3 This comment states that the commenter understands the short-term impacts related to tree removal and believes the long-term benefits outweigh the short-term challenges.

The comment addresses the merits of the project and not the environmental impact analysis. As indicated in Master Response 1, the Town of Ross prefers Alternative 1, and Alternative 1 is recommended for adoption because of Town preference.

Comment Letter C20

From: Nick Romero <nickromero@gmail.com>
Sent: Tuesday, March 23, 2021 9:43 PM
To: cortemaderacreek@marincounty.org
Subject: Corte Madera Creek Flood Risk Management Project

Hi, I realize this is past the formal comment period. apologies.

One question I had was what the tree mitigation plan would be for unit 2 - Fig 3.1- 20/21.

Specifically, residents would appreciate mature tree plantings (more diameter) to fully screen the new buildings at COM adjacent to the creek / stadium way bridge / Kent Middle School as the creek transitions to salt water marsh. Critical to keep all mature trees to hide maintenance facilty. C20-1

Additionally, residents would appreciate picnic tables and benches on the eastern side (3.1-9 photograph 8) and tree screening to screen unit 2, treatment / pump facility I. C20-2

I would advocate to keep trees in 3.1-18/19. C20-3

regards
Nick Romero
90 Berens Dr, Kentfield, CA 94904

--
Nick Romero
+1.805.746.5528
Email Disclaimer: https://www.marincounty.org/main/disclaimers

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2.5.8 Response to Letter C20: Nick Romero

C20-1 This comment states that residents would appreciate mature tree plantings in Unit 2 to screen the new buildings at the College of Marin.

As discussed in Master Response 4, private views are not considered to be an impact in the context of CEQA; therefore, private views are not discussed in the Draft EIR. Views of the College of Marin buildings and school facilities are part of the existing visual environment.

C20-2 This comment requests that the District add picnic tables and benches on the left bank of Unit 2 along Bike Route 20 (as shown in Figure 3.1-9 in the Draft EIR) and plant trees to screen Unit 2 and the stormwater pump station.

The proposed project would include a pocket park at the lower end of Unit 2. The existing picnic tables and benches would be relocated to that area. As discussed in Section 3.1 of the Draft EIR, the proposed project would result in less-than-significant aesthetics impacts on Unit 2 and the stormwater pump station. Therefore, no mitigation is required. Private views are not considered to be an environmental impact in the context of CEQA. See Master Response 4 for further discussion.

C20-3 This comment advocates retaining trees in Unit 2, as shown in Figure 3.1-19 in the Draft EIR.

The District does not propose removal of trees in the area shown in Figure 3.1-19 in the Draft EIR. The extent of tree removal in Unit 2 would be determined by USACE as part of its Section 408 permit authorization. See also response to comment B1-17.

Comment Letter C21

From: Nick Romero <nickromero@gmail.com>
Sent: Wednesday, March 24, 2021 9:41 AM
To: Dixon, Joanna <JDixon@marincounty.org>
Cc: Corte Madera Creek <cortemaderacreek@marincounty.org>
Subject: Re: Corte Madera Creek Flood Risk Management Project

Thank you, do you know if there us a plan yo cut trees and replant near the COM bldgs? the diameter / existing ratio means a big eye sore as the new, younger, trees fill back in for a decade C21-1

--

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2.5.9 Response to Letter C21: Nick Romero

C21-1 This comment asks whether a plan exists for tree removal and planting near the College of Marin buildings. The comment also states that it would be a big eye sore while waiting over a decade for the new trees to mature.

A conservative estimate of tree removal in Unit 2 and the Lower College of Marin area is shown in Figures 2.6-4 and 2.6-5 on pages 2-31 and 2-32 in the Draft EIR. Construction of the proposed floodwall in Unit 2 would require removal of four trees. Construction of the proposed floodwall in Unit 3 and the stormwater pump station would require removal of sixteen trees. The removal of 20 trees for project construction would not significantly impact aesthetics, as discussed from page 3.1-26 through 3.1-28 in the Draft EIR.

2.6 Public Hearing

Comment Letter PH

PANORAMA ENVIRONMENTAL, INC.

Public Hearing Comments

Date: March 2, 2021, 2:00 PM

Location: Zoom Link: https://www.zoom.us/join
Meeting ID: 946 4251 8384
Password: 352 533

Subject **Marin County Flood Control and Water Conservation District Board of Supervisors Public Hearing, Public Comments**

Table 1 Oral Comments (Not verbatim)

Name	Question	
Michael Wanger	Is the access ramp included in the EIR?	PH-1
	Upstream extension of the floodwall is located in land that is owned by the flood control district at the end of Locust Avenue. In the past, that strip of land has become a river with water flowing out of Corte Madera Creek across that strip of land and onto Locust and Cedar Avenue. How does the access ramp going to the bottom of the channel affect that? And how far upstream will the wall extend?	PH-2
GGP – Garril Page	First of all, the scheduling of this hearing is as subtle as parking in Joe Garbarino on Ross Common.	
	Second the County worked with the Corps of Engineers until terminating relations in March of 2019 then resulted in an EIR that was both procedurally deficient per CEQA and hydrologically flawed because the natural channel of Unit 4 was omitted. Comments of these failings have been ignored for years. Instead of dumping that deceptive document the District incorporated it into the current EIR.	PH-3
	Despite its mass and use of boilerplate, the current EIR is replete with repetition and is unresponsive to comments leaving question or frustrated for example this lowering of the grade in alternative 1 slide 38 is relatively new information that is undeveloped and improperly identified in the EIR.	PH-4
	Induced flooding remains an unmitigated consequence of the proposed project. Who is going to pay for that?	PH-5
	I repeat for the record of this hearing, this EIR is a procedurally and functionally indefensible document.	PH-6
Laura Conrow	How far away does the project grading and channel in Frederick Allen Park end from the tennis courts?	PH-7
	How many mature trees in the Frederick Allen Park area are slated to be saved as opposed to cut down?	PH-8
		PH-9

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MEMORANDUM

March 2, 2021
Page 2

Name	Question	
Charles Goodman	I'm a 50-year resident of the Town of Ross, on the Town Council for 12 years, and was a Mayor for three terms. I also live on the confluence of Corte Madera Creek and Ross Creek. The proposal is to remove the only 800 feet of the concrete channel that actually functions as designed by the Army Corps of Engineers and handles the super critical speed necessary. This section has not overflown its banks. You are replacing this portion of the concrete channel with a detention basin/settlement basin and still referring to that as a park by widening this area, you are slowing down the flow of water and sediment will drop out and accumulate. The estimated dead load of sediment in that area per year is around 7,000 tons which is several hundred truck loads.	PH-10
	So, my question was in the Draft EIR how the County plans to mitigate the substantial disruption of removing sediment from the Town. The question was not addressed and not answered, and I think it's a very important question.	
	The next point is that you are doing this whole project piecemeal, and it does not come together when you finish putting the pie together. For example, you have left out the complete area from San Anselmo Winship Bridge to the Lagunitas Road Bridge. There is no plan for any protection in that area and yet you are increasing the flow of water coming out of San Anselmo you are not addressing any of the water that comes from San Anselmo Bolinas Avenue, Shady Lane, Norwood, Southwood, Lagunitas Road that has to somehow get into the concrete channel and that needs to be addressed.	PH-11
	I would say in final that the least expensive of these proposed projects is Alternative 1 because I believe it provides the most benefit for the dollar and it's the least detrimental to the environment.	PH-12
	I would be happy to meet with any of you set up a meeting and show you the Frederick Allen Park.	
Willian Conrow	I wasn't even going to mention this but the Alternative 1 has the least as he mentioned detrimental to Frederick Allen Park. One of you said well it's that doesn't affect the tennis court. I disagree it's very close to the tennis courts and it would really basically destroy Frederick Allen Park with no trees etcetera.	PH-13
	Now, my real question though is are you concerned about flooding and if you're concerned about flooding is it because of water coming down Corte Madera Creek or is it you concern about ocean rising ocean level coming in. Which one of the two is the main concern?	PH-14
Julie McMillan	Julie McMillan is currently the Mayor of the Town of Ross. We will be considering this issue at our March 11th meeting and we will be submitting written comments before the March 17th deadline. We have received an initial report at our February meeting, but we really haven't had a chance to dive deep into the issue so you can look forward to hearing a written comment from the town of Ross.	PH-15

MEMORANDUM
March 2, 2021
Page 3

Name	Question	
Beth Foster	My property backs up to the concrete channel and it a bit upstream end of Unit 3, immediately downstream of the fish ladder. Our property extents to the centerline of the channel. A portion of the project is proposed on our property. I want to first to say that we apricate the potential flood benefit of the project, so we like to see it to move forward.	PH-16
	I have some concerns that are rather maybe questions about the potential impacts on our property. First of all is seeking some more information about the retaining walls that are proposed to the downstream side of the fish ladder, not really clear about the heights or appearance of these walls.	PH-17
	In addition, concern about the proposed clearance of trees. Section 2.2.6 of the EIR shows all the trees behind our house would be removed because of the 15-foot clearance. This included trees that are beloved to us and are important view from our home and screen the channel that is currently covered with graffiti. I don't think the EIR has to analyze impacts on private property. But we do have concern about the impact on our property value. We just want to have an opportunity to understand more about what is specifically being proposed at our home.	PH-18
	And lastly, more information about overland flow of stormwater in large storm events. There is a great deal of water that runs through the backyards of homes along Sir Francis Drake. I just like to understand better how this flood water is being handled with the project.	PH-19
	I would appreciate if the District would reach out to us again with more information.	PH-20
Pam Grant	I am Pam Grant. I live on Kent Avenue. I have three questions. One has to do with the drainage. At the point where the channel goes from dirt to cement, that is right around the Kentfield Hospital and right beyond the tennis court. At that point, are you going to put in any drainage, large drain that could be open? If there is an overflow, it is going to tunnel back into the cement channel and may jump out, ruining the Kentfield Hospital. I don't know what could possibly happen.	PH-21
	My next question is about the new building that College of Marin is putting in. When you show the diagram of the orange area, it looked to me like that orange area was right by the new building and when I went to that meeting, I asked them about flood issues, and they seem to be very vague they didn't know anything about flood issues were putting a presentation on. So, I was hopping there was communication between College of Marin and you guys. I just want to know why. I'm sure there is but there is a bridge or gap, if College of Marin is discussing any kind of help with the flood issue.	PH-22
	Number three question is I didn't understand, first of all I don't live in Ross thank God I live in Kentfield and so I can say bad things about Ross I don't be afraid of anyone going to go is really weird that you guys are all afraid but bottom line Ross is going to benefit from an area that's not used much now then maybe will be used more I mean the kids won't be able to do their looky-loos in an in the on the ground anymore because that'll be all cleared away	PH-23

Name	Question	
	but then getting back to the kids what are you guys thinking about protecting kids going into the wash. I mean during normal time especially during a flood.	PH-23 cont.
	And what is meant by heightened sensitivity in Ross about the trees. I love trees I have tons of trees. They can be a problem. When you say sensitivity. Does it mean the Ross citizens are requesting to keep it beautiful and keep the leaves which would be a fire hazard. Or they want to protect the endangered fish or what is it exactly about.	PH-24
	One other comment I want to make is when the flood does come in five or six years, I hope that you're going to put funds away from the flood fees to help the citizens recuperate.	PH-25

2.6.1 Response to Public Hearing Comments

PH-1 This comment asks whether the access ramp is included in the Draft EIR.

The access ramp would not be part of the proposed project. The access ramp would qualify for a Categorical Exemption and would provide a utility for concrete channel maintenance in the absence of the proposed project. A Notice of Exemption was filed on March 15, 2021, for the access ramp. Therefore, the access ramp is addressed as a cumulative project in the cumulative impact analysis in Chapter 4 in the Draft EIR.

PH-2 This comment asks how the access ramp would affect the issue related to flooding in the area at the end of Locust Avenue and how far upstream the wall would extend.

The new access ramp would be a concrete structure on District property at the end of Locust Avenue. The access ramp would extend from the existing ground surface into the concrete channel. A new floodwall also would be installed above ground around the access ramp, and would connect to the proposed floodwall in the Granton Park area. The floodwall would minimize creek flow overtopping to the Granton Park neighborhood. The entrance to the access ramp would be elevated above the existing grade to prevent water from flowing out the entrance to the access ramp. The access ramp itself would not affect the floodplain and creek flow. In addition, at the access ramp and along the Granton Park floodwall alignment, multiple storm drain inlets with backflow preventors would be installed to drain surface water from behind the floodwall. At the Granton Park pump station, a new storm drain inlet also would be installed, to drain runoff from the informal pathway along the concrete channel.

PH-3 This comment states that the 2018 Draft EIS/EIR is both procedurally deficient and hydrologically flawed because the natural channel in Unit 4 was omitted.

The current project design has been modified from USACE's 2018 project design, and the Draft EIR differs from the 2018 Draft EIS/EIR. The Draft EIR was prepared in accordance with all CEQA procedural requirements, and the hydrologic analysis in Section 3.9 in the Draft EIR presents substantial evidence for the impact determinations.

PH-4 This comment states that the District incorporated the deceptive 2018 Draft EIS/EIR into the Draft EIR.

As explained in response to comment PH-3, the Draft EIR differs from the 2018 Draft EIS/EIR. The Draft EIR is a separate document, based on a different project design with a new impact analysis. The District used the baseline resource studies that previously were prepared by USACE to the extent that those studies accurately described the resources in the project area, and no change in resource conditions had occurred from the baseline studies (e.g., geology and soils characterization and cultural resource surveys). Additional baseline resource studies were conducted to address gaps in the baseline analysis in the 2018 Draft EIS/EIR, and to update the analysis (e.g., noise data collection, tree survey, wetland delineation, biological resource investigation, hydrologic

modeling, and air quality modeling). The Draft EIR impact analysis reflects the impacts of the proposed project and alternatives considered and does not rely on the impact analysis from the 2018 Draft EIS/EIR.

PH-5 This comment states that the Draft EIR lacks information regarding the lowering of grade in Alternative 1. The comment also states that Alternative 1 is undeveloped and improperly identified in the Draft EIR.

Alternative 1 would include all project elements that are described in Chapter 2, Project Description, in the Draft EIR, except for the Frederick Allen Park enhancements in the Town of Ross. The project description in the Draft EIR includes details on how the proposed project would be constructed, including the grading of the Unit 4 channel to address the fish ladder removal. See Section 2.5 in the Draft EIR for a detailed discussion of project elements and design and see Section 2.6 for information regarding project construction. The difference between the proposed project and Alternative 1 is that Alternative 1 would not remove the concrete channel and would not construct a natural floodplain and riparian corridor in Frederick Allen Park. Alternative 1 would install four additional fish pools in the concrete channel adjacent to Frederick Allen Park, instead of removing the concrete channel. Alternative 1 would include all proposed project elements in Unit 2, lower Unit 3 (downstream from Frederick Allen Park), and Unit 4.

PH-6 This comment states that the induced flooding would not be mitigated because of the proposed project and asks who would be responsible to pay for future induced flooding impacts.

This comment is incorrect. The Draft EIR describes induced flooding and provides numerous graphics. Figures 3.9-7 to 3.9-9 and graphics in Appendix E in the Draft EIR detail the proposed changes in hydraulic conditions from project implementation. As discussed under Impact 3.9-5 beginning on page 3.9-54 in the Draft EIR, the hydraulic modeling shows no significant increase in flooding at any structures. The only significant increase in flooding would occur near the College of Marin. No mitigation is required because no significant increase in flooding would occur and require mitigation.

PH-7 This comment states that the Draft EIR is a procedurally and functionally indefensible document.

The Draft EIR was prepared in accordance with CEQA requirements and meets all standards under CEQA. It contains substantial evidence for each impact conclusion. The Draft EIR was prepared and noticed in accordance with all CEQA procedural requirements.

PH-8 This comment asks about the distance between the grading and natural channel in Frederick Allen Park and the tennis courts.

The end of the grading area in Frederick Allen Park is approximately 7 feet from the tennis courts. A retaining wall would be installed upstream from the tennis courts (see Figure 2.5-1 in the Draft EIR), which would protect the grade and transition back to the concrete channel. See Master Response 1 for information regarding the preference for Alternative 1.

PH-9 This comment asks how many mature trees are marked to be saved as opposed to be removed in Frederick Allen Park.

As shown in Figure 2.6-2 in the Draft EIR, approximately 100 trees are marked to remain in the Frederick Allen Park reach of Corte Madera Creek. See response to comment C9-11 regarding the extent of tree removal in Frederick Allen Park. See Master Response 1 and the preference for Alternative 1.

PH-10 This comment states that removal of the functional concrete wall and widening the channel would slow down the flow of water and cause sediment accumulation. The comment asks how the District plans to mitigate substantial disruption of sediment removal from the Town of Ross.

See response to comment C18-1. Frederick Allen Park was not designed to function as a detention basin. The widened creek section provides the space needed to establish a natural creek corridor, while maintaining the flow conveyance capacity needed for flood risk reduction. The creek cross section design incorporated a low-flow channel approximating a natural bank full-creek geometry. The low-flow channel would concentrate creek flows to a smaller cross section, which would increase the energy needed to transport sediment. In a larger storm event, sediment deposition possibly could occur along the floodplain benches at Frederick Allen Park. Maintenance of the floodplain benches would be included in the District's ongoing stream maintenance program. If needed, service vehicles and equipment could access the park for maintenance using the multi-use path or the new access ramp to the concrete channel in the Granton Park area.

PH-11 This comment states that the proposed project is piecemeal and would not address the area upstream from Winship Bridge to Lagunitas Road Bridge.

The modeling in the Draft EIR includes consideration of future conditions that would address planned and approved projects upstream from the project area on Corte Madera Creek.

See response to comment C11-10 regarding the District's jurisdiction. The District recognizes the integration and connectivity between the storm drain system, overland flow, and creek flow to provide stormwater runoff conveyance. The District would continue to work with municipalities across the watershed through the Ross Valley Watershed Program. The proposed project would be a part of the Ross Valley Watershed Program, and the hydraulic analysis in the Draft EIR includes the entire

watershed. The proposed project would address flooding issues along Corte Madera Creek within USACE Units 2, 3, and 4. Future projects in the watershed program would address other flooding issues in the watershed. Although the proposed project would not include specific project elements upstream from Lagunitas Road Bridge, the proposed project would reduce flood inundation in downtown Ross and also in areas upstream from Lagunitas Road Bridge. The District and the watershed program would continue to address flooding issues throughout the watershed through future flood risk reduction projects.

PH-12 This comment states that Alternative 1 would be the least expensive option because it would provide the most benefits with least cost, and because it would be the least detrimental to the environment.

See Master Response 1 regarding staff's recommendation to adopt Alternative 1. See Master Response 5 for discussion regarding economic impact.

PH-13 This comment states that Alternative 1 would be the least detrimental to Frederick Allen Park. The comment further states that the proposed project would be very close to the tennis courts and would destroy Frederick Allen Park without trees.

As explained in response to comment PH-8, the project would install a retaining wall at the downstream end of Frederick Allen Park and upstream from the tennis courts. The retaining wall would provide protection to the tennis courts and transition back to the concrete channel. See Master Response 1 regarding staff recommendation to adopt Alternative 1.

PH-14 This comment asks whether the proposed project would be concerned about creek flooding or sea-level rising.

The proposed project would be designed to address flooding on Corte Madera Creek and would not address sea-level rise. However, the hydraulic modeling for future conditions considered the proposed project's potential effectiveness in reducing flooding with future sea-level rise. The results of hydraulic modeling indicate that the proposed project still would be effective in reducing flooding in Ross Valley when considering moderate and high projections for sea-level rise. See Section 3.9.5 on page 3.9-37 in the Draft EIR for information regarding how sea-level rise was incorporated into the hydraulic modeling and see Impact 3.9-5 on page 3.9-61 in the Draft EIR for an analysis of flood impact when considering sea-level rise. See also Master Response 3.

PH-15 This comment states that the Town of Ross was to submit a written comment letter on the Draft EIR before the public comment period ended on March 17, 2021.

The Town of Ross comment letter is included as comment letter A5.

PH-16 This comment states appreciation for the potential flood benefit of the proposed project and anticipation of seeing the project move forward.

The comment addresses the merits of the project and not the environmental impacts.

PH-17 This comment asks about the height or appearance of the proposed project's retaining walls.

The new retaining wall along the left bank of the Corte Madera Creek channel, downstream from the fish ladder, would maintain the height of the existing concrete channel wall. See response to comment C16-5.

PH-18 This comment expresses concern about the proposed tree removal because of USACE's required 15-foot clearance and the potential impacts on property value.

The conservative estimate of tree removal that is included in the Draft EIR reflects USACE's guidance, as discussed in response to comment C16-7. See Master Response 4 regarding private views and privacy and Master Response 5 regarding impacts on property value and CEQA.

PH-19 This comment asks for more information regarding overland flow during large storm events.

See response to comment A5-26. Although the proposed project would not alter the existing overland flow pattern, it would provide net benefits through reduced overland flow along Sir Francis Drake Boulevard because of reduced overtopping of Corte Madera Creek flows upstream from the fish ladder.

PH-20 This comment expresses a desire for the District to reach out to the public again as the proposed project progresses.

The District is continuing coordination with public agencies throughout project implementation.

PH-21 This comment asks whether the proposed project would install any drainage around Kentfield Hospital and right beyond the tennis court.

The proposed project would not include storm drain improvements at Kentfield Hospital. At the downstream end of the Frederick Allen Park component, the creek flow would transition from the restored floodplain to the existing concrete channel. The hydraulic analysis did not show increased creek overtopping and inundation at Kentfield Hospital. Also see Master Response 3 regarding the hydraulic modeling for the Alternative 1 60 percent design.

PH-22 This comment asks whether the District and the College of Marin have communicated regarding the new building at the College of Marin and how the project would affect this building.

The District has been coordinating with the College of Marin about the proposed project and would continue to coordinate with the College of Marin before project construction, to obtain any necessary easement. At the Learning Resources Center site, at the downstream limit of the site adjacent to College Avenue, the proposed project would construct a new floodwall to funnel overland flow along the banks of the concrete channel back into the concrete channel and minimize overland flow in the area. Refer to response to comment B2-1.

PH-23 This comment asks what has been proposed to prevent children from going into the creek during flood events.

As discussed under Impact 3.8-13 on page 3.8-13 in Section 3.8 in the Draft EIR, the District has proposed safety measures and procedures to reduce the risk of public hazards from flooding. The proposed measures and procedures would include closing access to the creek before predicted major storm events and posting signage at the access points to notify the public about the risk of flooding.

PH-24 This comment asks what is meant by heightened sensitivity in Ross regarding the trees.

Viewer sensitivity is used in the aesthetic analysis and is defined on page 3.1-2 and 3.1-3 in the Draft EIR. Viewer sensitivity refers to how concerned viewers are with changes to visual quality in an area. The scoping comments indicated that viewers would be sensitive to changes in the tree canopy and changes in visual quality in Frederick Allen Park.

PH-25 This comment states the desire to see the District set aside funds from the flood fees to help the citizens recuperate when future flood events occur.

This comment is not relevant to the proposed project or EIR impact analysis.

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3 Draft EIR Text Revisions

3.1 Introduction

This chapter presents revisions to the Corte Madera Creek Flood Risk Management Project, Phase 1 (project) Draft EIR that was published on February 1, 2021. These revisions include both (1) changes made to text, tables, or figures in response to comments on the Draft EIR as discussed and presented in Chapters 2 and 3, as well as (2) staff-initiated text changes to correct minor inconsistencies, to add minor information or clarification related to the project, and to provide updated information where applicable. None of the revisions or corrections in this chapter substantially change the analysis and conclusions presented in the Draft EIR.

The chapter includes all revisions by reproducing the relevant excerpt of the Draft EIR in the sequential order by the chapter, section, and page that it appears in the document. Preceding each revision is a brief explanation for the text change, either identifying the corresponding response codes, such as Response A1-1, where the issue is discussed in Chapter 2 or 3, or indicating the reason for a staff-initiated change. Deletions in text and tables are shown in strikethrough (~~strikethrough~~) and new text is shown in underline (underline).

3.2 Changes to the Draft EIR

3.2.1 Cover, Table of Contents, Acronyms, Abbreviations, and Glossary

A staff-initiated text change has been made to the List of Table in the Draft EIR Table of Contents (page TOC-iii) as follows:

> Table ES-1 Summary of Scoping Comments and Areas of Potential Controversy……ES-13
>
> Table ES-~~1~~2 Summary of Impacts and Mitigation for the Project……ES-17

3.2.2 Executive Summary

In response to comment A5-1, Section ES.3.1 Significant and Unavoidable Impact in the Draft EIR (page ES-9) has been revised as follows:

> The District would implement Mitigation Measure ~~3.1-2~~ 3.1-3: Large Tree Planting, which requires integrating large box trees into the planting plan and design for Frederick Allen Park.

In response to comment A5-2, Section ES.5 Summary of Alternatives to the Project in the Draft EIR (page ES-11) has been revised as follows:

> Compared to the proposed project, Alternative 1 would reduce short-term impacts on aesthetics, air quality, biological resources, geology and soils, GHG emission, hazardous materials, hydrology and water quality, noise, recreation, transportation and circulation, and utilities. Alternative 1 would avoid the significant and unavoidable impact on visual quality. Alternative 1 would result in less long-term benefits to aesthetics, biological resources, geology and soils, hydrology and water quality, and recreation than the proposed project and provide less long-term GHG emission reduction benefits compared to the proposed project because Alternative 1 would involve less planting and natural stream processes that provide long-term GHG reductions through carbon sequestration. Alternative 1 would meet all feasibility criteria and would meet most project objectives.
>
> Compared to the proposed project, Alternative 2 would result in reduced operational impacts and increased long-term benefits on biological resources, hydrology and water quality, hazards, recreation, and transportation and circulation. Compared to the proposed project, Alternative 2 would result in a minor long-term net benefit for GHG emissions. Alternative 2 would meet all feasibility criteria and all project objectives.

In response to comment A5-2, Section ES.5 Summary of Alternatives to the Project in the Draft EIR (page ES-12) has been revised as follows:

> Compared to the proposed project, Alternative 3 would result in a slight reduction in long-term aesthetic, biological, and hydrology and water quality impacts than the proposed project. However, this alternative could result in slightly increased temporary air quality, GHG emissions, and energy impacts during construction due to increased import of materials. Alternative 3 would result in similar long-term GHG emission impacts as the proposed project. Alternative 3 would meet all feasibility criteria and all project objectives.

A staff-initiated text change has been made to Table ES-1 in the Draft EIR (page ES-17) as follows:

Table ES-~~1~~2 Summary of Impacts and Mitigation for the Project

In response to comment A5-1, Table ES-2 Summary of Impacts and Mitigation for the Project in the Draft EIR (Page ES-28) has been revised as follows:

Impact	Level of Significance Before Mitigation	Mitigation Measures
Impact 3.1-3: The project would substantially degrade the existing visual character or quality of public views of the site and its surroundings	Potentially Significant	**Mitigation Measure 3.1-3: Large Tree Planting**. The District will integrate ~~large box trees~~ 24-inch or 36-inch box trees into the final planting plan and design for Frederick Allen Park, to the extent ecologically appropriate for the proposed species. The Town of Ross will provide the desired size and species of trees to the District. The final planting plan will be provided to the Town of Ross for review and approval ~~comment~~ no less than 90 days prior to landscaping. The District will be responsible for maintaining replacement trees until they become established and for replacing dead trees for a period of no less than 10 years.
Impact 3.4-2: The project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	Potentially Significant	**Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources.** If evidence of any subsurface archaeological features or deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find, and the finds shall be protected until they are examined by a qualified archaeologist. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone-milling equipment (e.g., mortars, pestles, handstones, milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls and deposits of metal, glass, and/or ceramic refuse. The District shall retain a qualified archaeologist who meets the U.S. Secretary of the Interiors professional qualifications in archaeology to assess the significance of the find and make recommendations for further evaluation and treatment as necessary. A Native American representative from a traditionally and culturally affiliated tribe will be notified and invited to assess the find if the artifacts are of Native American ancestry and determined to be more than an isolated find. If the discovery is in an area below Stadium Way and on lands under the jurisdiction of California State Lands Commission, that agency shall be notified. Any treatments and disposition of any artifacts uncovered under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission before the treatment is implemented. If, after evaluation, a resource is considered a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in PRC Section 21074), all preservation options shall be considered as required by CEQA (see CEQA Guidelines Section 15126.4 and PRC 21084.3), including possible capping, data recovery, mapping, or avoidance of the resource. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil. Work in the area may resume, at the direction of the District, upon completion of treatment. An Unanticipated Discoveries Evaluation and Treatment Plan shall be prepared before construction that details the procedures for dealing with unanticipated discoveries, including procedures that would be implemented for discoveries that cannot be protected in place. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.
Impact 3.12-3: The project could affect existing recreational opportunities.	Potentially Significant	**Mitigation Measure ~~3.1-2~~ 3.1-3: Large Tree Planting (see Aesthetics and Visual Resources above)** **Mitigation Measure 3.12-3: Temporary Shade Structures.** The District shall coordinate with the Town of Ross to select the type and location for installation of temporary shade structures in Frederick Allen Park. The temporary shade structures shall be located along the edge of the Bike Route 20 multi-use path and at seating areas as needed to provide shade during the vegetation establishment period. The temporary shade structures shall be removed when the tree canopy has sufficiently established to provide afternoon shade of the pathway and as determined through coordination with the Town of Ross. The District will submit a draft plan for the shade structures to the Town of Ross no less than 60 days prior to construction. **Mitigation Measure 3.14-1: Traffic Management (see Transportation and Circulation below)**
Impact 3.13-1: The project could conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	Potentially Significant	**Mitigation: Mitigation Measure 3.13-1: Traffic Management** Prior to initiation of construction, the Project contractor(s) shall use a qualified traffic engineer to prepare a Traffic Management Plan (TMP). The TMP shall be developed on the basis of detailed design plans. The TMP shall be reviewed and approved by the District and agencies with jurisdiction over roadways affected by project construction activities prior to construction. Once approved, the TMP shall be incorporated into the contract documents specification. The TMP shall include, but not necessarily be limited to, the elements listed below: • Develop a detour plan for bicycle and pedestrian traffic that shows the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin Parking lot to Ross Common. • Post temporary Bike Route 20 detour and associated signage that meets all the accessibility requirements stated under the Americans with Disabilities Act and CBC Title 24. • Post signs providing public notice of detours at least ~~14~~ 20 days prior to temporary bike route closure. • Provide flaggers at the tennis courts within Frederick Allen Park to provide safe pedestrian access to the tennis courts. • Control and monitor construction-vehicle movements by enforcing standard construction specifications through periodic on-site inspections.

Impact	Level of Significance Before Mitigation	Mitigation Measures
		• Install traffic-control devices where traffic conditions warrant, as specified in the applicable jurisdiction's standards (e.g., the California Manual on Uniform Traffic Control Devices; Part 6: Temporary Traffic Control); flaggers would be used, when warranted, to control vehicle movements. • Implement a public information program to notify interested parties of the impending construction activities using means such as print media, radio, and/or web-based messages and information. • Comply with roadside safety protocols to reduce the risk of accidents. • Maintain access for emergency vehicles at all times. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways. • Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner as to minimize obstruction to traffic.

3.2.3 Chapter 1 Introduction

In response to comments A5-6 and B1-2, Section 1.1.4 Town of Ross in the Draft EIR (page 1-5) has been revised as follows:

> **1.4.4 Town of Ross**
>
> The Town of Ross owns Frederick Allen Park. The District would ~~will~~ need to obtain Town of Ross approval of an easement for construction and maintenance of project elements on Town property. The District would ~~will~~ enter into a maintenance agreement with the Town regarding maintenance of project elements within Frederick Allen Park. The Town is a responsible agency under CEQA in the review of project elements within Town jurisdiction. The proposed project would require the Town's Design Review approval and an easement for construction and long-term management of the constructed habitats. In addition, a Town of Ross tree removal permit ~~is~~ would be required prior to removing trees within the Town of Ross.

3.2.4 Chapter 2 Project Description

In response to comment B1-26, page 2-1 in the Draft EIR has been revised as follows:

> San Anselmo Creek and Ross Creek merge to form Corte Madera Creek west of the Lagunitas Road Bridge ~~flows into Corte Madera Creek west of Greenbrae at the confluence with Ross Creek.~~

In response to comment A5-8, Figures 2.5-1 to 2.5-3 in the Draft EIR (pages 2-9 to 2-11) have been revised as follows to show the existing concrete channel walls on both sides of the channel:

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Figure 2.5-1 Project Elements (Map 1 of 3)

Figure 2.5-2 Project Elements (Map 2 of 3)

Figure 2.5-3 Project Elements (Map 3 of 3)

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In response to comment B1-27, page 2-14 in the Draft EIR has been revised as follows:

- **Habitat-enhancing elements.** Creek habitat would be enhanced by replacing the concrete channel with an earthen channel and vegetation downstream from Stadium Way ~~Avenue~~.

In response to comment B1-28, page 2-23 in the Draft EIR has been revised as follows:

Rock and fill energy dissipators, a vegetated bioretention basin, and boulder-lined bioswales would be installed within the newly created ~~channel~~ habitats, including the transition zone.

A vest-pocket park ~~would be created~~ adjacent to the existing multi-use path would be enhanced~~. The upland habitat around the pocket park would be enhanced~~ by planting native ~~understory~~ vegetation ~~beneath the existing trees~~. The two existing trees in the park would be preserved.

In response to comment B1-29, Figure 2.5-8 in the Draft EIR (page 2-25) has been revised, as shown on the following page.

In response to comment B1-3-, Table 2.6-1 Temporary Work Area and permanent Modifications by Element on page 2-26 in the Draft EIR has been revised as follows:

Unit 2	Floodwall (segment #1)	4,750	950	5,700
	Lower College of Marin concrete channel removal	0	80,419~~86,250~~ [a, b]	80,419~~86,250~~

In response to comments B1-25 and B1-31, Figure 2.6-1 in the Draft EIR (page 2-27) has been revised, as shown on the following page.

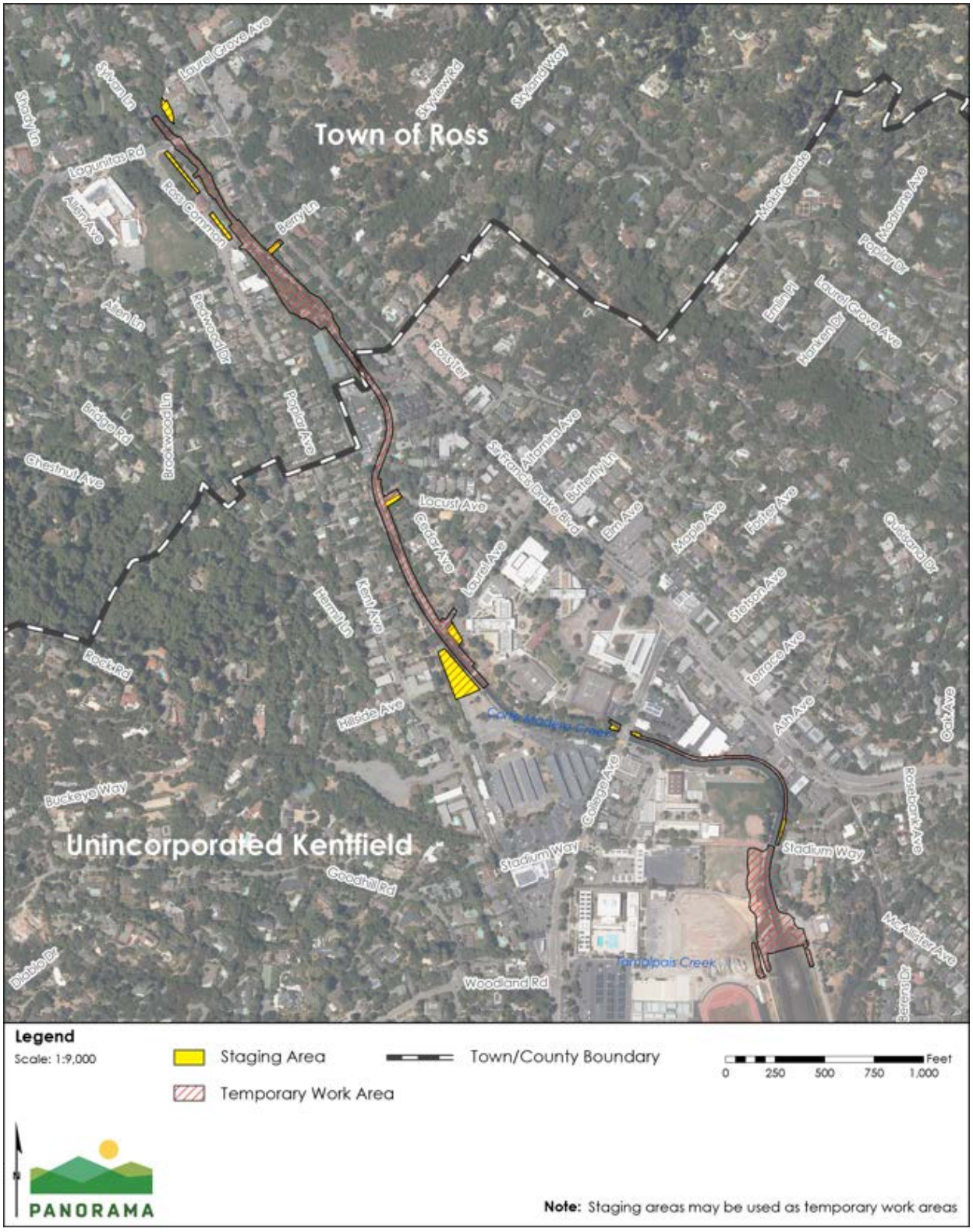
In response to comment A5-9, Section 2.6.4 Grading in the Draft EIR (page 2-34) has been revised as follows:

2.6.4 Grading

Project construction would require grading within the Corte Madera Creek channel and Frederick Allen Park. Areas of channel lowering (Unit 4) and concrete channel removal would be excavated (cut). In addition to earthen fill in some locations, rock placement would be needed for channel stability and to protect utilities. A concrete apron or half-ton rock would be installed where the fish ladder would be removed in Unit 4, to stabilize sediment and soils. Concrete would be used for the short floodwalls, for retaining walls, and to seal the excavated fish pools. Excavation and fill quantities for each project element are identified in Table 2.6-3.

Figure 2.5-8 Lower College of Marin Concrete Channel Removal Habitat Creation

Figure 2.6-1 Staging, Stockpile, and Temporary Work Areas



In response to comment A5-5, Table 2.6-4 Tree Planting List on page 2-37 in the Draft EIR has been revised as follows:

Common Name	Species Name	Size
Frederick Allen Park		
Coast live oak	Quercus agrifolia	36-inch box[a]
Valley oak	*Quercus lobata*	24-inch box[a]
Lower College of Marin Concrete Channel Removal		
Box elder	*Acer negundo*	Treepot 4 [ab]
Buckeye	*Aesculus californicus*	Treepot 4 [ab]
Coast live oak	*Quercus agrifolia*	Treepot 4 [ab]
Valley oak	*Quercus lobata*	Treepot 4 [ab]

[a] A 36-inch box tree would be approximately 10 to 20 feet in height and a 24-inch box tree would be approximately 8 to 15 feet height

[ab] The sizes indicated are minimum size requirements. Treepot 4 is a 4-inch square by 14-inch-deep pot.

In response to comment A5-10, Section 2.7.2 Maintenance in the Draft EIR (page 2-42) has been revised as follows:

2.7.2 Maintenance

Once constructed, the project would require ongoing maintenance activities. Maintenance would be similar to existing District maintenance on Corte Madera Creek; however, the newly constructed habitat would require additional landscape maintenance and vegetation management during the establishment period. Maintenance activities would include the following:

1. Vegetation management
2. Sediment and debris removal
3. Stormwater pump station maintenance
4. Annual floodwall and structure inspection and maintenance

Most maintenance activities would occur during the dry season from April 15 to October 15. The Town of Ross would need to grant an easement to the District for maintenance of project elements on Town property, specifically in Frederick Allen Park. As a part of the easement approval process, the District would enter into a maintenance agreement with the Town of Ross that would specify the District's and Town's responsibilities for maintenance of project elements in Frederick Allen Park.

In response to comment A5-11, Section 2.7.2 in the Draft EIR (page 2-42) has been revised as follows:

Vegetation Management

Vegetation-management activities are employed to achieve three main goals:

1. Maintain channel flow capacity.
2. Reduce fire fuels.
3. Restore creek habitat by removing invasive nonnative plants and revegetating with native plants.

Vegetation management activities would not include ground-disturbing activities. These activities employ vegetation control methods such as cutting and removing invasive vegetation above the ground by hand or with loppers, hand saws, chainsaws, pole saws, weed eaters, and other hand tools. Removal of nonnative vegetation, tree removal, and thinning employ a mix of tools including chainsaws, loppers, hand saws, pole saws, hedge trimmers, and other hand tools. Vegetation management also would include maintenance of replacement trees planted in Frederick Allen Park, including monitoring the establishment of trees after planting.

In response to comment A5-13, Table 2.8-1 in the Draft EIR (page 2-44) has been revised as follows:

Town of Ross	Tree permit Easement and MOU for construction and maintenance within Frederick Allen Park (Town of Ross property) Design review

3.2.5 Chapter 3 Environmental Setting, Impacts, and Mitigation

3.0 Introduction

No revisions were made to this section.

3.1 Aesthetics and Visual Resources

In response to comment A5-14, Section 3.1.3 Aesthetic and Visual Concepts in the Draft EIR (page 3.1-2) has been revised as follows:

3.1.3 Aesthetic and Visual Concepts

Baseline aesthetic conditions are defined within the context of visual quality and visual sensitivity. For the purpose of this EIR, visual quality and visual sensitivity were defined consistent with the Federal Highway Administration (FHWA) Guidelines for the Visual Impact Assessment of Highway Projects (Federal Highway Administration 2015). While the project is not a highway project, the FHWA guidance was used to evaluate overall baseline visual quality in the project area because Marin County has not developed their own guidance for evaluating visual quality and the FHWA guidance was developed to address visual impacts in urban environments, similar to the visual environment of the

proposed project. The Town of Ross's design review criteria and standards (Section 18.41.100 of the Town of Ross Municipal Code) would be addressed during the Town of Ross design review process.

In response to comment B1-27, page 3.1-6 in the Draft EIR has been revised as follows:

Lower Unit 3 and Unit 2 within the Kentfield area share similar characteristics as upper Unit 3 within the Town of Ross. Unit 3 extends from Kentfield Hospital downstream to just south of Stadium Way ~~Avenue~~. Bike Route 20 continues through Kentfield adjacent to the right bank of the creek, eventually crossing to the left bank at the Stadium Way ~~Avenue~~ Bridge.

In response to comments A5-15 and B1-32, Figure 3.1-5 in the Draft EIR (page 3.1-8) has been updated with the correct photo in the FEIR as follows:

Figure 3.1-5 Photograph 8: View of Upper Unit 3 Fish Pools from Kentfield Hospital Bridge, Looking Southeast

In response to comments A5-16, A5-17, and A5-18, page 3.1-15 in the Draft EIR has been revised to include the following text under Section Town of Ross Municipal Code:

Section 12.24.100. Tree Protection Plan. To protect trees during construction of a project and thereafter, and to maximize the chances of their subsequent survival, a Tree Protection Plan shall be required on sites where Significant or Protected trees may be affected. The Tree Protection Plan shall include a certified arborist's report on existing conditions as well as a plan for tree protection during project construction.

(1) When a Tree Protection Plan is Required. A tree protection plan shall be required as part of the materials submitted with applications for Hillside Lot Permits and Hazard Zone Use Permits.

A Tree Protection Plan may be required for Subdivision Permits, Variances, Demolition Permits, Design Review, or Grading and/or Building Permit reviews at the discretion of the Public Works Director or Town Council, as applicable.

Chapter 18.41, Design Review

Purpose (b): This chapter is intended to guide new development to preserve and enhance these special qualities of Ross and to sustain the beauty of the town's environment.

Section 18.41.100 Design Review Criteria and Standards.
(a) Preservation of Natural Areas and Existing Site Conditions.

(1) The existing landscape should be preserved in its natural state by keeping the removal of trees, vegetation, rocks and soil to a minimum. Development should minimize the amount of native vegetation clearing, grading, cutting and filling and maximize the retention and preservation of natural elevations, ridgelands and natural features, including lands too steep for development, geologically unstable areas, wooded canyons, areas containing significant native flora and fauna, rock outcroppings, view sites, watersheds and watercourses, considering zones of defensible space appropriate to prevent the spread of fire.

(2) Sites should be kept in harmony with the general appearance of neighboring landscape. All disturbed areas should be finished to a natural-appearing configuration and planted or seeded to prevent erosion.

(d) Materials and Colors.

(2) Natural materials such as wood and stone are preferred, and manufactured materials such as concrete, stucco or metal should be used in moderation to avoid visual conflicts with the natural setting of the structure.

(3) Soft and muted colors in the earth-tone and wood-tone range are preferred and generally should predominate.

(g) Fences and Screening.

Fences and walls should be designed and located to be architecturally compatible with the design of the building. They should be aesthetically attractive and not create a "walled-in" feeling or a harsh, solid expanse when viewed from adjacent vantage points. Front yard fences and walls should be set back sufficient distance from the property line to allow for installation of a landscape buffer to soften the visual appearance. Transparent front yard fences and gates over four feet tall may be permitted if the design and landscaping is compatible and consistent with the design, height and character of fences and landscaping in the neighborhood. Front yard vehicular gates should be transparent to let light and lines of sight through the gate. Solid walls and fences over four feet in height are generally discouraged on property lines adjacent to a right-of-way but may be permitted for properties adjacent to Poplar Avenue and Sir Francis Drake Boulevard based on the quality of the design, materials, and landscaping proposed. Driveway gates should be automatic to encourage use of onsite parking.

Pedestrian gates are encouraged for safety, egress, and to encourage multi-modal transportation and pedestrian-friendly neighborhood character.

(h) Views.

Views of the hills and ridgelines from public streets and parks should be preserved where possible through appropriate siting of improvements and through selection of an appropriate building design including height, architectural style, roof pitch and number of stories.

(i) Natural Environment.

(1) The high-quality and fragile natural environment should be preserved and maintained through protecting scenic resources (ridgelands, hillsides, trees and tree groves), vegetation and wildlife habitat, creeks, drainageways threatened and endangered species habitat, open space and areas necessary to protect community health and safety.

(j) Landscaping.

(1) Attractive, fire-resistant, native species are preferred. Landscaping should be integrated into the architectural scheme to accent and enhance the appearance of the development. Trees on the site, along public or private streets and within twenty feet of common property lines, should be protected and preserved in site planning. Replacement trees should be provided for trees removed or affected by development. Native trees should be replaced with the same or similar species. Landscaping should include planting of additional street trees as necessary.

(2) Landscaping should include appropriate plantings to soften or screen the appearance of structures as seen from off-site locations and to screen architectural and mechanical elements such as foundations, retaining walls, condensers and transformers.

(3) Landscape plans should include appropriate plantings to repair, reseed and/or replant disturbed areas to prevent erosion.

(4) Landscape plans should create and maintain defensible spaces around buildings and structures as appropriate to prevent the spread of wildfire.

(5) Wherever possible, residential development should be designed to preserve, protect and restore native site vegetation and habitat. In addition, where possible and appropriate, invasive vegetation should be removed.

The following text has been added to page 3.1-15 under Town of Ross General Plan in the Draft EIR.

> **3.2. Landscape Design.** Where appropriate, encourage landscape designs that incorporate existing native vegetation, enhance the cohesiveness of the Town's lush, organic landscape and integrate new planting with existing site features.

In response to comments A5-16, A5-17, and A5-18, Impact 3.1-2 in the Draft EIR (pages 3.1-20 and 3.1-21) has been revised as follows:

> **Town of Ross General Plan**
>
> As discussed above under Goal 1, the proposed project would involve native riparian vegetation planting within Unit 4 and Upper Unit 3 (Frederick Allen Park), which would improve the existing riparian habitat adjacent to the creek. The proposed project would involve native tree planting in the park, including willows along the channel. The proposed project would be consistent with Policy 3.2 because landscaping would include planting native vegetation that would enhance the existing environment and have a beneficial impact on riparian habitat.
>
> **Town of Ross Municipal Code**
>
> Chapter 12.24 of the Municipal Code provides ratios for replacing trees that have been removed and requirements for a Tree Protection Plan. The project would adhere to the mitigation ratios and tree replacement standards in the Town of Ross Municipal Code, and the District would obtain a tree removal permit from the Town of Ross to ensure there would be no conflict. The District would prepare a Tree Protection Plan as part of the Design Review process. The Tree Protection Plan would include a certified arborist's report on the existing trees in the project area that could be affected by project construction and a plan for protecting existing trees during construction. Because the District would provide tree planting and replacement at the ratio required by the Town of Ross, ~~and~~ obtain a Tree Removal Permit ~~tree removal permit~~ from the Town of Ross, and prepare a Tree Protection Plan, the impact from conflict with Town of Ross Municipal Code would be less than significant.
>
> Section 18.41.100 of the Municipal Code provides guidelines for development in the Town of Ross. The Town of Ross would be responsible for verifying that the proposed project complies with the Town's Design Review guidelines through the Design Review process. The following analysis is presented for informational purposes only and does not replace the Town of Ross's independent Design Review.
>
> The proposed project would involve removal of trees and vegetation to construct a new riparian floodplain and natural creek channel. As discussed previously, the proposed project would adhere to mitigation ratios and tree replacement standards in the Town of Ross's Municipal Code and would involve planting riparian vegetation, to enhance habitat along the creek. Disturbed areas would be revegetated and planted with new trees, to maintain and enhance the landscape habitat along the creek. The proposed

project also would remove the concrete walls within the creek channel and replace the concrete channel with a natural creek channel, which would be consistent with Section 18.41.100(a) of the Municipal Code. Therefore, the proposed project would comply with Design Review criteria and standards (a), Preservation of Natural Areas and Existing Site Conditions, and no impact would occur.

The concrete retaining wall in Frederick Allen Park would not extend above the ground surface and would be shorter than the existing concrete channel wall. Project landscaping and vegetation would minimize the visual contrast of the retaining wall with the surrounding area. The retaining wall would not conflict with the surrounding natural setting. The new floodwall in Frederick Allen Park would be 2 feet high and also would be screened by landscaping and native vegetation. Because native vegetation would be visible along the expanse of the floodwall, the floodwall would not conflict with the surrounding natural setting. The proposed project would result in a substantial net reduction in concrete in Frederick Allen Park and increase in use of natural materials, compared to existing conditions, and would comply with design review criteria and standards (d) Materials and Colors.

The proposed project would include a split-rail fence in Frederick Allen Park, which would be installed along the top of the channel to prevent encroachment into habitat areas during the vegetation establishment period. The split-rail fence could be removed after the habitat is established. The split-rail fence would not create a solid expanse and would allow light and lines of site through the spaces in the fence. The fence would not conflict with design review criteria and standards (g) Fences and Screening, and no impact would occur.

As described under Impact 3.1-1, the proposed project would not impact scenic vistas or views, including views of hillsides and ridgelines. The proposed project would not conflict with Design Review criteria and standards (h) Views because the project elements would be low-lying and would not block any views of scenic vistas or ridgelines. Thus, no impact would occur.

The proposed project would not impact ridgelands, hillsides, or tree groves. The proposed project would replace the trees removed in Frederick Allen Park, in accordance with the Town of Ross's Municipal Code. The proposed project would include habitat enhancing elements, including riparian vegetation planting in Unit 4 and Upper Unit 3, and concrete channel removal in Upper Unit 3 and lower Unit 2. The proposed project would result in more natural creek conditions and enhanced habitat and would comply with the natural environment guideline (Section 18.41.100[i] of the Municipal Code). Therefore, the proposed project would not conflict with Design Review criteria and standards (i) Natural Environment. No impact would occur.

As discussed above, the proposed project would involve riparian vegetation planting, and trees proposed for removal would be replaced, per the Town of Ross's Municipal

Code. Graded areas in Frederick Allen Park would be revegetated to prevent erosion. After being constructed, the proposed project would require ongoing vegetation management as a part of maintenance activities, which would include removal of invasive nonnative plans and revegetation with native plans. The proposed project would comply with design review criteria and standards (j) Landscaping. No impact would occur.

The proposed project would comply with all applicable Town of Ross design review criteria and standards and there would be no significant impact.

In response to comment A5-21, page 3.1-26 in the Draft EIR has been revised as follows:

After a period of approximately 10 years, a new tree canopy would become established, and the visual character of the park would be similar to the existing conditions where trees shade the pathway and screen views of the surrounding buildings and structures as shown in Figure 3.1-13. After 20 years, the trees would mature and an extensive tree canopy would cover the park, as shown in Figure 3.1-14. The improvements to the park, including tree planting, additional seating, educational signage, and access to the creek would provide views of a natural creek corridor and would provide greater wildlife viewing opportunities due to the wildlife that would be attracted to the area. Under the District's MOU with the Town of Ross for maintenance in Frederick Allen Park, the District would be responsible for maintenance of replacement trees planted in the park, including monitoring establishment of trees after planting. This would ensure that the tree planting is successful, and that the tree canopy is established in the park.

In response to comment B1-15, Figure 3.1-16, KOP 2: Visual Simulation of Pump Station, Unit 3 on page 3.1-34 in the Draft EIR has been revised the show the pump station painted a neutral color as follows:

Figure 3.1-16 KOP 2: Visual Simulation of Pump Station, Unit 3

In response to comment A5-5 and Comment A5-23, the text of Mitigation Measure 3.1-3: Large Tree Planting has been revised as follows:

> **Mitigation Measure 3.1-3: Large Tree Planting**. The District will integrate ~~large box trees~~ 24-inch or 36-inch box trees into the final planting plan and design for Frederick Allen Park, to the extent ecologically appropriate for the proposed species. The Town of Ross will provide the desired size and species of trees to the District. The final planting plan will be provided to the Town of Ross for review and approval ~~comment~~ no less than 90 days prior to landscaping. The District will be responsible for maintaining replacement trees until they become established and for replacing dead trees for a period of no less than 10 years.

3.2 Air Quality

In response to comment B1-33, Figure 3.2-2 in the Draft EIR (page 3.2-12) has been revised, as shown on the following page.

3.3 Biological Resources

In response to comments B1-25 and B1-31, Figure 3.3-3 in the DIER (page 3.3-11) has been revised, as shown on the following page.

Figure 3.2-2 Sensitive Receptors within 1,000 Feet of the Project Area

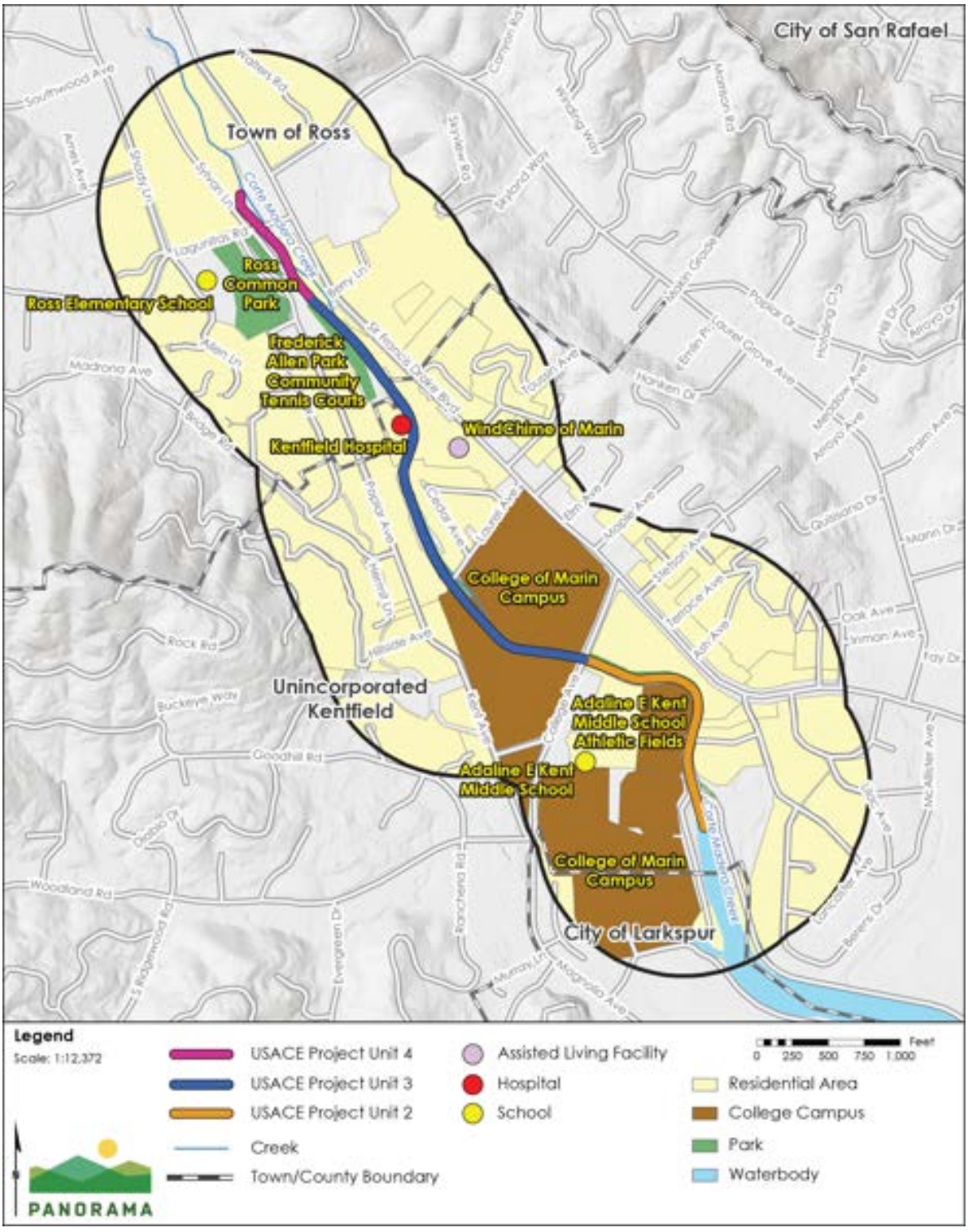


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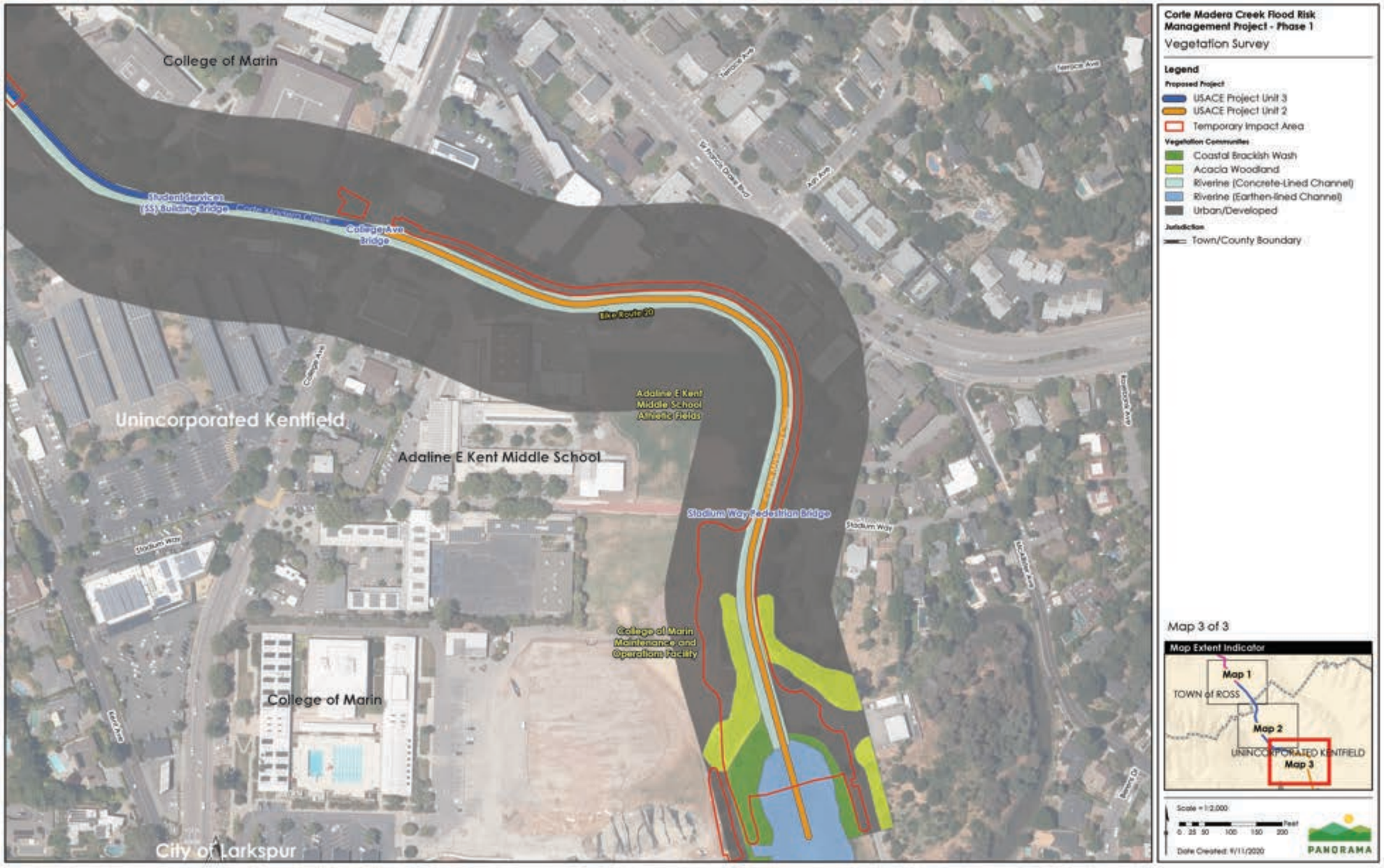
Figure 3.3-3 Habitat Types within Project Area (Map 3 of 3)



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In response to comment B3-8, page 3.3-17 in the Draft EIR has been revised as follows:

> Wildlife Marin Audubon Society ~~Friends of Corte Madera Creek Watershed has~~ conducted ~~Christmas~~ ~~Bird Counts~~ bird counts along Corte Madera Creek from 1978 to 2019~~2003.~~

A staff-initiated text change has been made to page 3.3-36 in the Draft EIR as follows:

> Studies in the Central Valley found that summering populations are substantially more abundant in remnant riparian stands of cottonwood or sycamore greater than 164 feet wide than in younger, less-extensive stands (Pierson, Rainey, & Corben, ~~2000~~ 2006).

In response to comment A5-18, Impact 3.3-5 in the Draft EIR (page 3.3-88) has been revised as follows:

> The District would be required to obtain a tree removal permit from the Town of Ross and provide replacement trees as specified in the Town of Ross Municipal Code. The District would also be required to prepare a Tree Protection Plan as part of the Design Review process. The Tree Protection Plan would include a certified arborist's report on the existing trees in the project area that could be affected by project construction and a plan for protecting existing trees during construction. Because the District would obtain a tree removal permit and prepare a Tree Protection Plan in compliance ~~and comply~~ with the Town of Ross tree protection ordinance, the impact from conflict with Town of Ross ordinance for the protection of biological resources would be less than significant.

A staff-initiated text change has been made to page 3.3-94 in the Draft EIR as follows:

> Pierson, E. D., Rainey, W. E., & Corben, a. C. (~~2000~~ 2006). Distribution and status of red bats, Lasiurus blossevillii in California. Prepared for California Department of Fish and Game, Species Conservation and Recovery Program, Habitat Conservation Planning Branch, Sacramento.

3.4 Cultural Resources

In response to comment A1-2, the text of Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources has been revised as follows:

> **Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources.**
>
> If evidence of any subsurface archaeological features or deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find, and the finds shall be protected until they are examined by a qualified archaeologist. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone-milling equipment (e.g., mortars, pestles, handstones, milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls and deposits of metal, glass, and/or ceramic refuse. The District shall retain a

qualified archaeologist who meets the U.S. Secretary of the Interiors professional qualifications in archaeology to assess the significance of the find and make recommendations for further evaluation and treatment as necessary. A Native American representative from a traditionally and culturally affiliated tribe will be notified and invited to assess the find if the artifacts are of Native American ancestry and determined to be more than an isolated find. If the discovery is in an area below Stadium Way and on lands under the jurisdiction of California State Lands Commission, that agency shall be notified. Any treatments and disposition of any artifacts uncovered under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission before the treatment is implemented.
If, after evaluation, a resource is considered a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in PRC Section 21074), all preservation options shall be considered as required by CEQA (see CEQA Guidelines Section 15126.4 and PRC 21084.3), including possible capping, data recovery, mapping, or avoidance of the resource. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil. Work in the area may resume, at the direction of the District, upon completion of treatment. An Unanticipated Discoveries Evaluation and Treatment Plan shall be prepared before construction that details the procedures for dealing with unanticipated discoveries, including procedures that would be implemented for such discoveries that cannot be protected in place. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.

3.5 Energy

No revisions were made to this section.

3.6 Geology and Soils

In response to comment B1-26, page 3.6-2 in the Draft EIR has been revised as follows:

> San Anselmo Creek and Ross Creek merge to form Corte Madera Creek west of the Lagunitas Road Bridge ~~flows into Corte Madera Creek west of Greenbrae at the confluence with Ross Creek.~~

In response to comment A5-24, page 3.6-23 in the Draft EIR has been revised as follows:

> **Operation and Maintenance**
>
> The proposed project would ~~will~~ require removal of trees and vegetation within Frederick Allen Park and within Unit 2 to create natural habitat. The area of tree removal would be replaced with native vegetation including shrubs, grasses, and riparian trees. Revegetation would provide long-term stabilization to avoid substantial soil loss. The area of grading and excavation at the stormwater pump station and the

floodwalls would be permanently stabilized by the project elements that would be installed in the area, including gravel and concrete. Long-term maintenance activities in Frederick Allen Park would be the responsibility of the District, as specified in the maintenance MOU between the Town of Ross and the District.

In response to comment B1-34, page 3.6-25 in the Draft EIR has been revised as followed:

Lower College of Marin

The Bay Mud underlying the Lower College of Marin Project area is weak. The Lower College of Marin Project work involves removal of a portion of the existing concrete channel and riprap, creating a less steeply sloped habitat area and planting the area to establish saltwater marsh and transitional habitat. Riprap would be reinstalled as needed for stability. The reduced slope of the created habitat relative to existing conditions, and use of soil stabilization, including riprap reuse, would generally stabilize the underlying soils. In addition, Marin County Municipal Code requires the Department of Public works to review acceptable soils and geologic reports prior to construction activities located on Bay Mud. ~~Per these regulatory requirements, the geotechnical investigation report for the lower College of Marin concrete channel removal, which is located on Bay Mud, will~~ The Miller Pacific geotechnical report prepared by for the Lower College of Marin Project includes detailed information related to soils matters such as stability, erosion; and settlement, and ~~will~~ includes recommendations for remediating soil instability ~~expansive soils~~, ~~which may includes for example,~~ including removal of these soils and ~~replacement~~ replacing them with ~~engineered~~ imported fill. With adherence to the Marin County Municipal Code, the project would have a less than significant impact due to its location on unstable soil units.

3.7 Greenhouse Gas Emissions

In response to comment A5-25, page 3.7-11 in the Draft EIR has been revised as follows:

- Adopt and implement a policy requiring limitations on idling for commercial vehicles, construction vehicles, buses and other similar vehicles, beyond state law, where feasible.
- Continue to enforce policies and programs that regulate the removal and replacement of significant trees.
- To the extent possible, require new development to be planned around existing trees.
- Support the preservation and creation of conservation areas that provide carbon sequestration benefits, such as those with tree cover.

3.8 Hazards and Hazardous Materials

No revisions were made to this section.

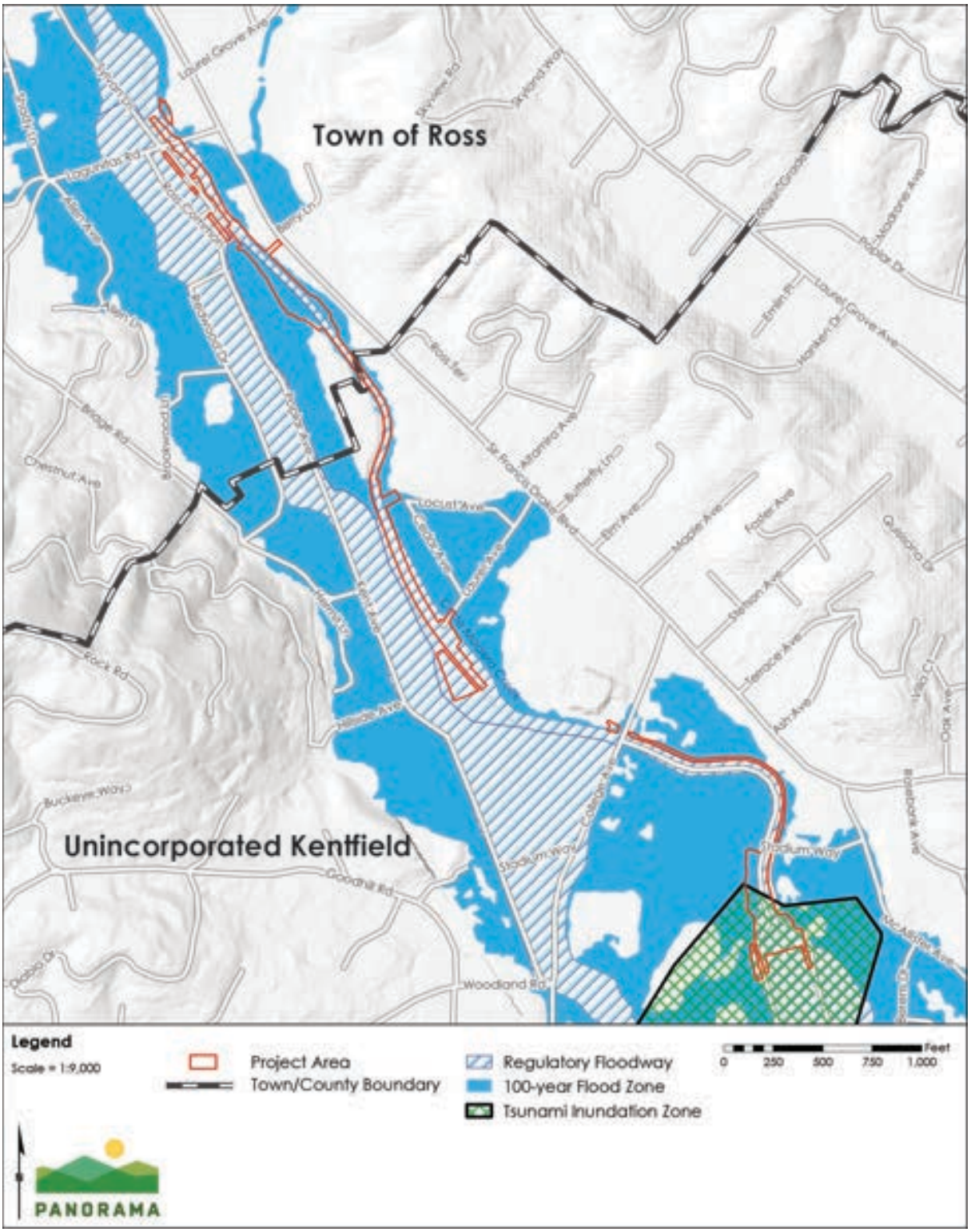
3.9 Hydrology and Water Quality

In response to comment A5-27, page 3.9-16 in the Draft EIR has been revised as follows:

> **Floodway and Tsunami Inundation Zones**
> Given that project construction would involves work in or along the creek channel, the project area at least partially would overlaps the regulatory floodway. A small portion of Unit 2, Lower Corte Madera Creek, is in the Tsunami Inundation Area (California Emergency Management Agency, 2009) (see Figure 3.9-3 below). Any locations where the proposed project would cause an increase in the 100-year base flood elevation within the regulatory floodway would require a Conditional Letter of Map Revision from FEMA.

In response to comments B1-25 and B1-31, Figure 3.9-3 in the DIER (page 3.9-18) has been revised as follows:

Figure 3.9-3 Floodway and Tsunami Inundation Zones



In response to comment B1-37, pages 3.9-21 and 3.9-22 in the Draft EIR have been revised as follows:

> Corte Madera Creek also exhibits high water temperatures. These increased temperatures have been attributed to urbanization of the watershed, specifically the reduction of shaded stream surface area due to loss of riparian vegetation and increased channel width, although less so within Unit 4 (Friends 2008a, in (USACE, 2010)). Increased temperatures also have been attributed to low streamflow, caused by groundwater pumping for irrigation, and lack of infiltration, caused by extensive impermeable surfaces.

In response to comments B1-39 and B1-40, pages 3.9-42 and 3.9-43 in the Draft EIR has been revised as follows:

> ***Unit 2 Lower College of Marin Concrete Channel Removal***
>
> The ~~l~~Lower College of Marin Project ~~concrete channel removal~~ will involve ~~the~~ removal of portions of the concrete-lined flood control channel walls downstream ~~of~~ from Stadium Way to restore natural creek function and create tidal and wetland habitat.
>
> Much of the exposed area will be revegetated with native vegetation; however, re-exposed channel sediments could be mobilized during tidal flows. The Unit 2 concrete channel removal project area is within the tidal influence of the San Francisco Bay. The Central San Francisco Bay is listed on the 303(d) list for mercury, PCBs, furan compounds, dioxin compounds, pesticides, and other contaminants. Sediments that would be excavated and exposed during construction could potentially be contaminated due to existing known contaminants in the San Francisco Bay, and the construction could result in transport of sediments and associated pollutants into San Francisco Bay. The transport of contaminated sediment to San Francisco Bay would be a significant impact. Soil testing was performed on samples from borings in the Lower College of Marin Project's concrete removal area (Geomorph Design Group, 2020). The soil samples were tested for heavy metals (CAM 17 metals), TPH (gas, diesel, and motor oil), semi-volatile organic compounds and PCBs. No hazardous materials were detected in the samples, and the soil contaminants are within the standard background levels for Marin County. ~~The implementation of **Mitigation Measure 3.9-1: Conduct Soil/Sediment Testing**, would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized.~~
>
> As mentioned in the analysis of the other project elements construction above, compliance with the Construction General Permit and implementations of the SWPPP and associated BMPs would reduce the potential degradation of surface water quality and potential impacts from construction-related spills or leaks. Therefore, with the implementation of the SWPPP~~,~~ and associated BMPs, ~~and Mitigation Measure 3.9-1, construction of~~ the ~~l~~Lower College of Marin concrete channel removal would not violate water quality standards or waste discharge requirements or otherwise substantially

degrade surface or ground water quality. The impact would be less than significant ~~with the application of the prescribed mitigation measure.~~

A staff-initiated text change has been made to page 3.9-47 in the Draft EIR as follows:

Unit 2 Lower College of Marin Concrete Channel Removal ~~Corte Madera Creek (Phase 2)~~

In response to comment B1-40, pages 3.9-47 and 3.9-48 in the Draft EIR have been revised as follows:

Following concrete removal, much of the exposed area will be revegetated with native vegetation. However re-exposed channel sediments along the lower banks and streambed could be mobilized during ~~tidal flows or~~ flood events and tidal conditions, possibly building up fine sediment deposition in the reach that could be mobilized during daily tidal cycles, potentially increasing turbidity and transporting associated pollutants into San Francisco Bay. As discussed above, soil sampling in the Lower College of Marin area concluded that the soils are not hazardous, and the proposed project would not expose contaminated soil and sediment. ~~Implementation of Mitigation Measure 3.9-1 would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized during construction.~~ In addition, site-specific bank protection will be installed in areas determined to be at increased risk of erosion or scour and creation and enhancement of vegetated tidal habitat would minimize the risk of erosion and increased turbidity to a less than significant level. Therefore, ~~with the implementation of Mitigation Measures 3.9-1,~~ operation and maintenance in this element would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant ~~with mitigation.~~

A staff-initiated text change has been made to page 3.9-60 and Table 3.9-7 in the Draft EIR as follows:

The number of parcels ~~by area~~ in Ross Valley that would benefit from decreased flooding during a 25-year flood event under existing conditions are summarized in Table 3.9-7 below. The parcels that would benefit from reduced flooding during the 25-year flood event are shown in Figure 3.9-10.

Jurisdiction/Land Use	Number of ~~Structures~~ Parcels with Reduced Flooding				
	Area No Longer Inundated After Project	1 to 4.5 feet reduction in water surface	0.5 to 1 foot reduction in water surface	0.2 to 0.5 foot reduction in water surface	Total

A staff-initiated text change has been made to page 3.9-68 in the Draft EIR as follows:

> ~~Marin County. (2020b). *Marin County Flood Control and Water Conservation District, Real-Time Rainfall, Creek Stage, and Weather Data*. Retrieved from County of Marin: https://marin.onerain.com/site/?site_id=1555&site=0fc267e5-331e-48fc-8a35-8512b95e4737~~

3.10 Noise

In response to comment B1-33, Figure 3.10-3 in the Draft EIR (page 3.10-10) has been revised as shown on the following page.

A staff-initiated text change has been made to page 3.10-19 in the Draft EIR as follows:

> ***Lower College of Marin ~~Corte Madera Creek~~ Concrete Channel Removal***

3.11 Public Services

No revisions were made to this section.

3.12 Recreation

In response to comment B1-43, Figure 3.12-2 in the Draft EIR (page 3.12-4) has been revised, as shown on the following page.

In response to comment B1-44, page 3.12-14 in the Draft EIR has been revised as follows:

> ***Unnamed Paths***
>
> The project would require temporary closure of unnamed paths #1~~,~~ and #2~~, and #3~~ during construction of floodwalls and temporary closure of unnamed path #3 during removal of the concrete channel and habitat enhancement in Unit 2.

Figure 3.10-3 Noise Measuring Sites and Sensitive Receptors within 1,000 Feet of the Project Area

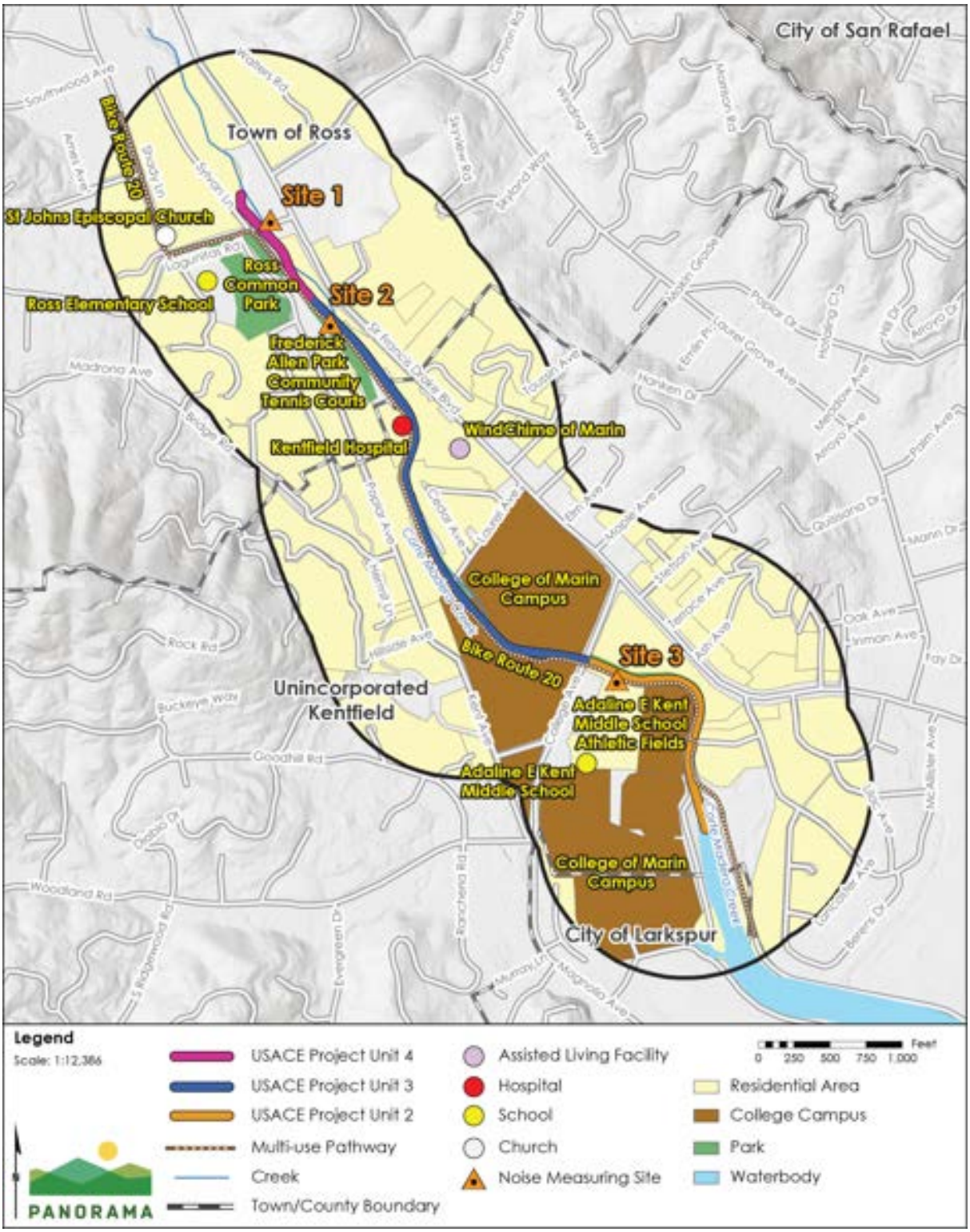
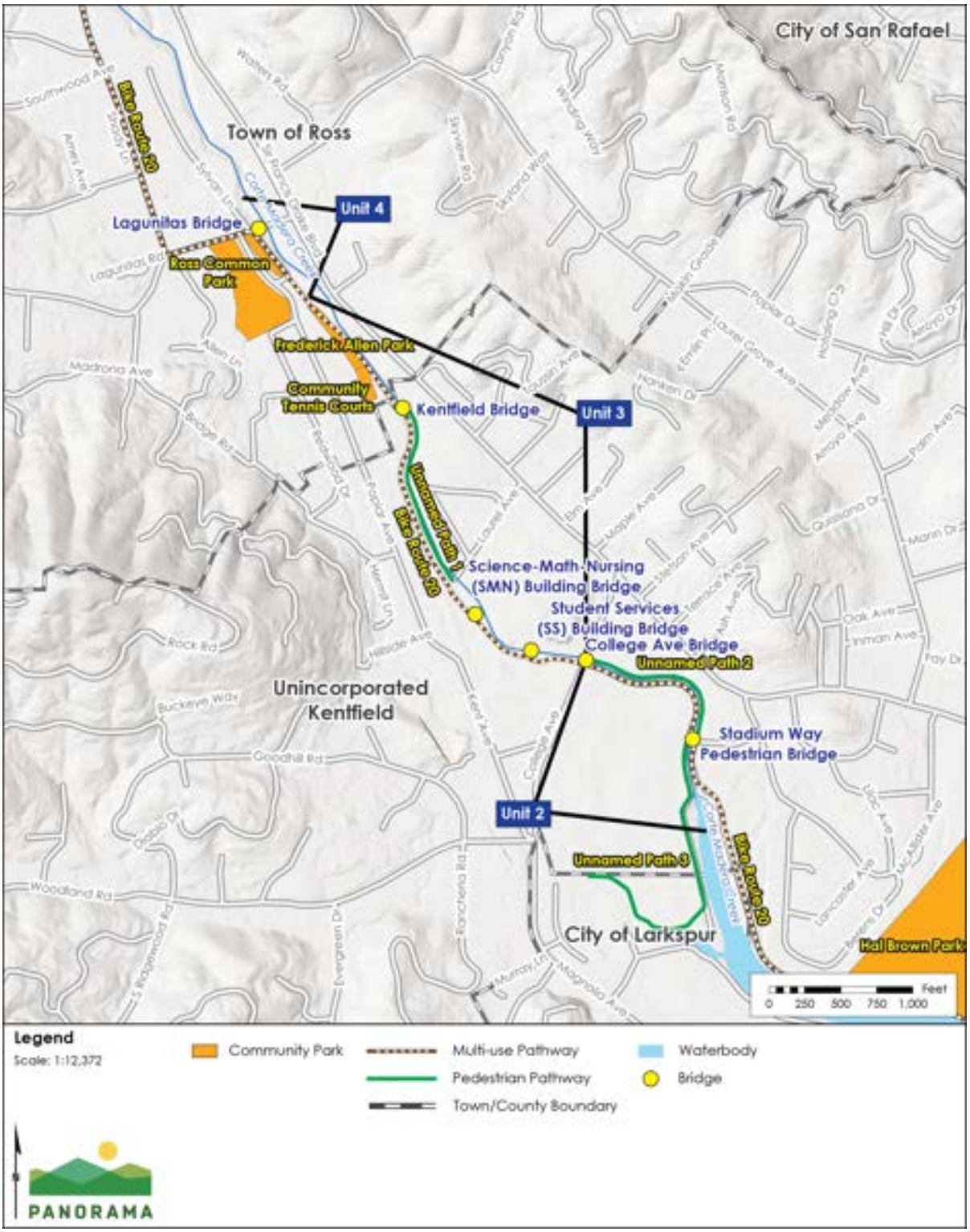


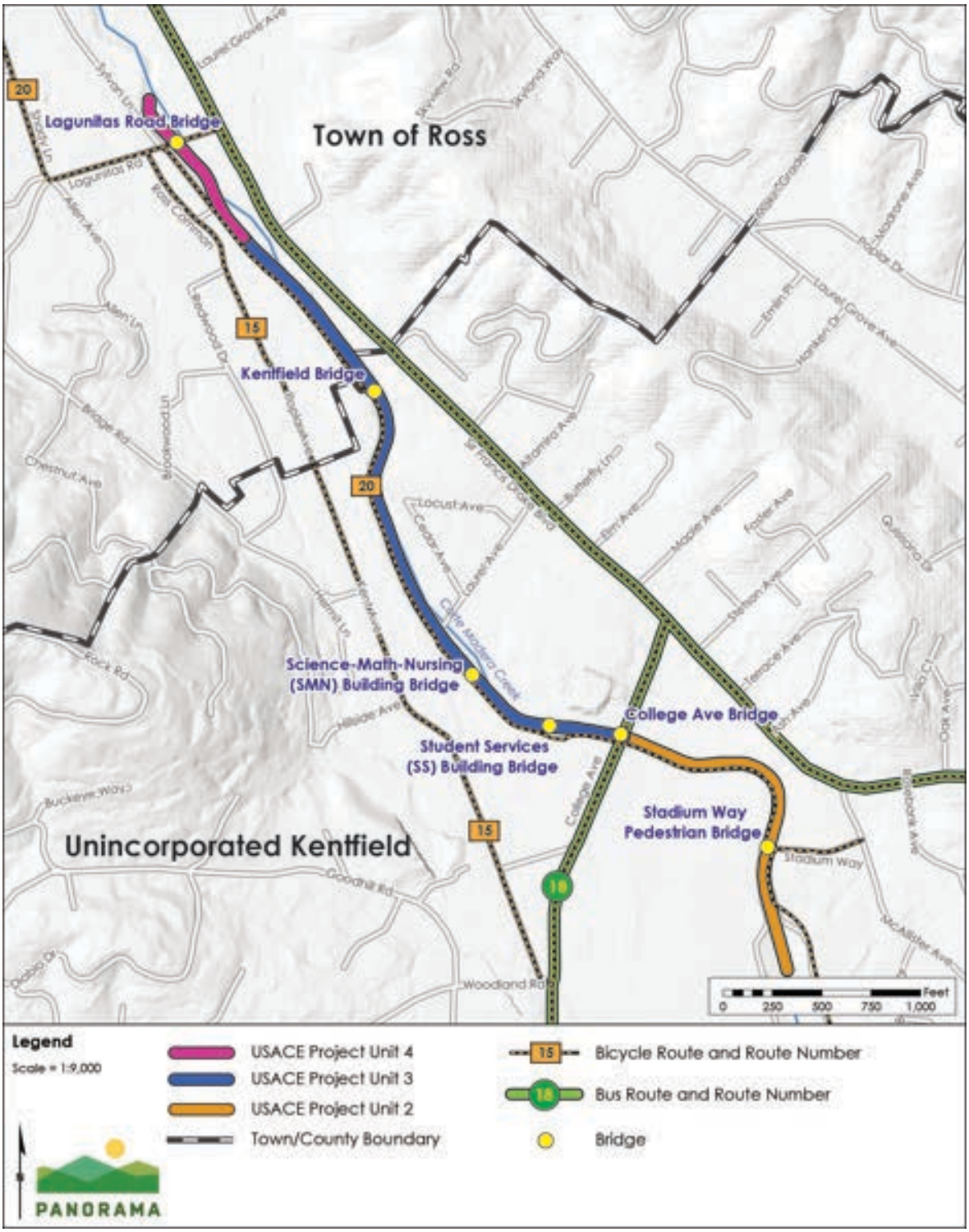
Figure 3.12-2 Parks and Recreational Facilities in the Project Area



3.13 Transportation and Circulation

In response to comment B1-45, Figure 3.13-1 in the Draft EIR (page 3.13-3) has been revised as follows:

Figure 3.13-1 Local Transportation Network



In response to comment B1-46, page 3.13-4 in the Draft EIR has been revised as follows:

> Bike Route 20, a biking and pedestrian pathway, follows ~~the right bank of~~ Corte Madera Creek ~~and runs~~ from the Larkspur Ferry Terminal to the Town of Fairfax (Marin County Bicycle Coalition, 2008). ~~Bike Route 20 is a biking and pedestrian pathway.~~ Downstream from Stadium Way, the bike route follows the left bank of the creek. Moving upstream, the bike route crosses from the left bank to the right bank of the creek at the Stadium Way bridge. The bike route continues along the right bank as an off-street paved multi-use path, across College Avenue, to the beginning of Unit 4. The bike route then transitions to an on-road bike path adjacent to Unit 4. ~~The segment of Bike Route 20 within the project area consists of an off-street paved multi-use pathway adjacent to Corte Madera Creek Units 2 and 3. Bike Route 20 transitions to an on-road bike path adjacent to Unit 4. Bike Route 20 crosses over Corte Madera Creek from the right bank to the left bank at the Stadium Way pedestrian bridge and continues along the left bank as an off-street paved multi-use path to Bon Air Road.~~ Bike Route 20~~, within Units 3 and 2,~~ is heavily trafficked by pedestrians and bicyclists, including commuters.

A staff-initiated text change has been made to page 3.13-6 in the Draft EIR as follows:

> The following traffic-related goals and policies presented in the Marin Countywide Plan are applicable to the project (Marin County Community Development Agency, 2~~015~~ 2007):

In response to comment B1-47, page 3.13-8 in the Draft EIR has been revised as follows:

> Vehicles traveling to the ~~l~~Lower College of Marin ~~concrete channel removal~~ area would travel on ~~Woodland Road~~ College Avenue and into the College of Marin campus at the entrance to parking lot 12. Limited vehicle access would also occur on segments of Bike Route 20 within Unit 3 and on an informal path within the District's easement on the left bank.

In response to comment A3-7, Mitigation Measure 3.13-1: Traffic Management has been revised as follows:

> **Mitigation: Mitigation Measure 3.13-1: Traffic Management**
>
> Prior to initiation of construction, the Project contractor(s) shall use a qualified traffic engineer to prepare a Traffic Management Plan (TMP). The TMP shall be developed on the basis of detailed design plans. The TMP shall be reviewed and approved by the District and agencies with jurisdiction over roadways affected by project construction activities prior to construction. Once approved, the TMP shall be incorporated into the contract documents specification. The TMP shall include, but not necessarily be limited to, the elements listed below:
>
> - Develop a detour plan for bicycle and pedestrian traffic that shows the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin Parking lot to Ross Common.

- The temporary Bike Route 20 detour and associated signage shall meet all accessibility requirements as set forth under the Americans with Disabilities Act and CBC Title 24.
- Post signs providing public notice of detours at least ~~14~~ 20 days prior to temporary bike route closure.
- Provide flaggers at the tennis courts within Frederick Allen Park to provide safe pedestrian access to the tennis courts.
- Control and monitor construction-vehicle movements by enforcing standard construction specifications through periodic on-site inspections.
- Install traffic-control devices where traffic conditions warrant, as specified in the applicable jurisdiction's standards (e.g., the California Manual on Uniform Traffic Control Devices; Part 6: Temporary Traffic Control); flaggers would be used, when warranted, to control vehicle movements.
- Implement a public information program to notify interested parties of the impending construction activities using means such as print media, radio, and/or web-based messages and information.
- Comply with roadside safety protocols to reduce the risk of accidents.
- Maintain access for emergency vehicles at all times. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways.
- Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner as to minimize obstruction to traffic.

A staff-initiated text change has been made to page 3.13-16 in the Draft EIR as follows:

> Marin County Community Development Agency. (~~2015~~ 2007). *Marin Countwide Plan: Transportation Element.*

3.14 Tribal Cultural Resources

No revisions were made to this section.

3.15 Utilities and Service Systems

A staff-initiated text change has been made to page 3.15-1 in the Draft EIR as follows:

> **Water Supply**
>
> The Marin Municipal Water District (MMWD) is a public agency that serves approximately 191,300 customers in south and central Marin County. The MMWD provides water to the project area for domestic, commercial, and firefighting use. The MMWD facilities include seven reservoirs, ~~four~~ three water-treatment plants, and various storage tanks, pumps, and distribution mains (MMWD, 2020).

In response to comment B1-48, page 3.15-1 in the Draft EIR has been revised as follows:

> Several stormwater lines and MMWD water ~~and stormwater~~ lines are in the project area. There are water supply and stormwater lines that cross the creek just upstream of Lagunitas Road Bridge in Unit 4. Water pipelines are also adjacent to the southern end of Unit 4 and parallel parts of Bike Route 20. Two stormwater lines are near the proposed storm drain pump station in Unit 3. Smaller stormwater lines are scattered throughout Unit 3 and Unit 2. One water pipeline crosses the creek aboveground at Stadium Way in Unit 2. See Figure 3.15-1 to Figure 3.15-3 for locations of water pipelines in the project area.

In response to comment A4-1, page 3.15-2 in the Draft EIR has been revised as follows:

> RVSD sanitary sewer lines run beneath Corte Madera Creek in a northwest/southeast direction within the project area from the southern end of Unit 4 near the fish ladder to near the end of Unit 2. The sewer lines cross beneath Corte Madera Creek at the approximate location of the fish ladder and at Stadium Way in Unit 2 (refer to Figure 3.15-1 to Figure 3.15-3). The sewer line that crosses Corte Madera Creek at the end of Stadium Way passes beneath the concrete channel in a siphon structure adjacent to the pedestrian bridge. ~~An aboveground sewer pipe crosses the creek on the pedestrian bridge at the end of Stadium Way (Figure 3.15-3).~~

In response to comments B1-25 and B1-51, Figures 3.15-1, 3.15-2, and 3.15-3 in the Draft EIR (pages 3.15-3, 3.15-4, and 3.15-5) have been revised as follows:

Figure 3.15-1 Utilities and Service Systems in the Project Area (Map 1 of 3)

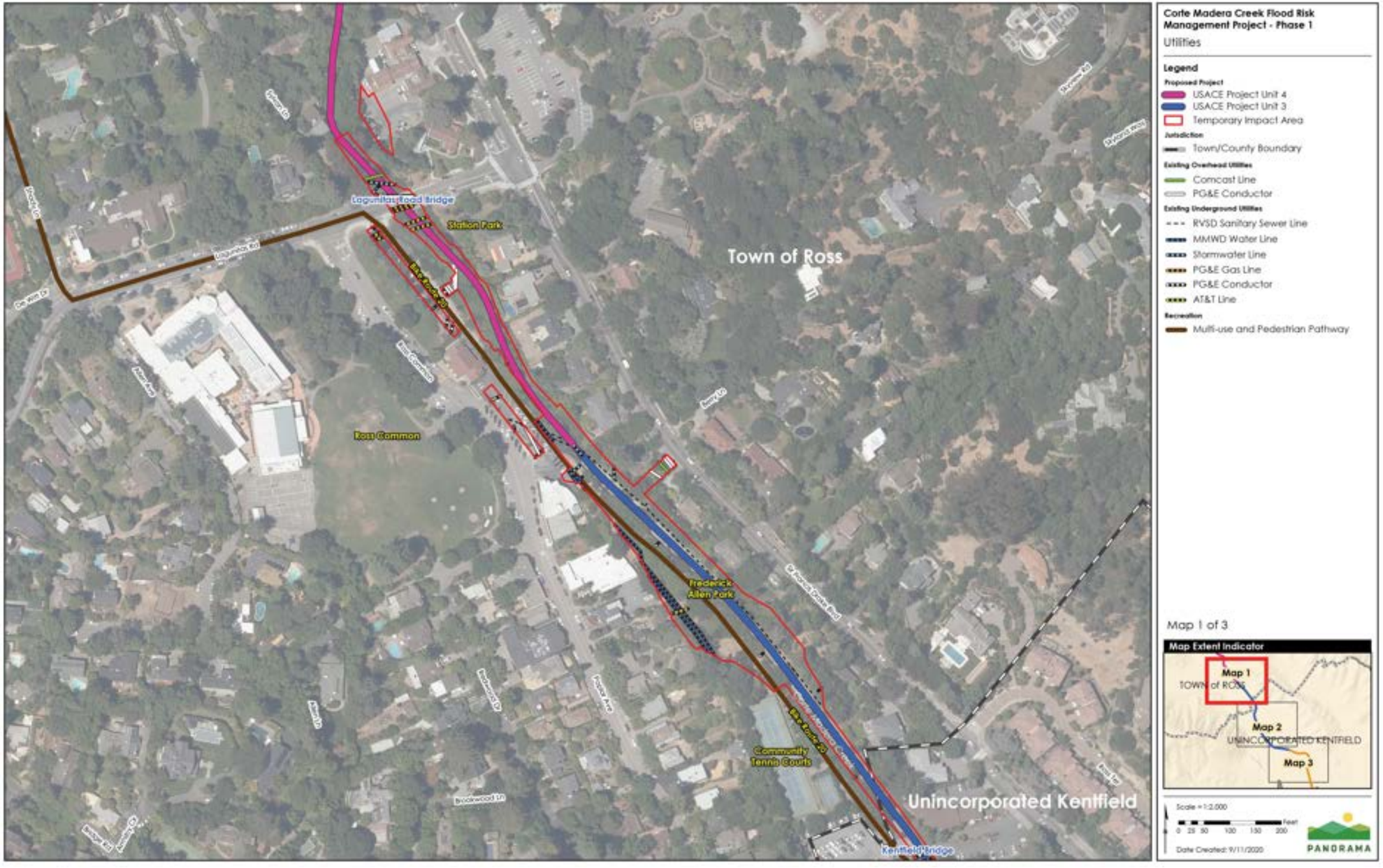


Figure 3.15-2 Utilities and Service Systems in the Project Area (Map 2 of 3)

Figure 3.15-3 Utilities and Service Systems in the Project Area (Maps 3 of 3)

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3.16 Agriculture and Forestry Resources, Mineral Resource, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics

A staff-initiated text change has been made to page 3.16-36 in the Draft EIR as follows:

~~U.S. Census Bureau. (2000). 2000 Census. Retrieved August 14, 2020, from https://www.census.gov/programs-surveys/decennial-census/decade.2000.html~~

~~U.S. Census Bureau. (2010). 2010 Census. Retrieved August 14, 2020, from https://www.census.gov/programs-surveys/decennial-census/decade.2010.html~~

~~U.S. Census Bureau. (2020). Population and Housing Unit Estimates Tables. Retrieved August 19, 2020, from https://www.census.gov/content/census/en/programs-surveys/popest/data/tables.2015.html/~~

3.2.6 Chapter 4 Growth Inducing and Cumulative Effects

In response to comment B1-20, page 4-10 in the Draft EIR has been revised as follows:

23	Corte Madera Creek Project Phase II (Friends of Corte Madera Creek Watershed)	Corte Madera Creek Project Phase II would include removal of the existing concrete channel from College Avenue <u>to Stadium Way</u> along College of Marin property. The channel bed would be in natural substrate. The right bank would be laid back to create a natural creek slope. The left bank would remain with either an existing concrete wall, a new shorter wall, or large rock embankment to protect an existing Ross Valley Sanitation District owned sewer pipeline that runs parallel to the concrete channel left bank. <u>In addition, the proposed project would relocate Bike Route 20 from the right bank to the left bank of the creek.</u>	Project Planning	Not currently scheduled. Engineering and environmental for Phase 2 will begin after completion of Phase I.

A staff-initiated text change has been made to Table 4.3-1 in the Draft EIR (page 4-13) as follows:

<u>30, 31, 32, and 33</u>	Marin Road, Spruce Road, Canyon Road, and Creek Road Bridge Rehabilitation	The Town of Fairfax is planning upgrades to four bridges which span San Anselmo and Fairfax Creeks on Marin Road, Spruce Road, and Canyon Road. Major upgrades may require seismic retrofits to address structural issues.	The projects are in early planning and require design and environmental review.	The construction schedule cannot be determined due to limited information on the design and environmental review process.

In response to comment B1-21, Cumulative Project #34 has been added to Table 4.3-1 in the Draft EIR (page 4-13) as follows:

34	Learning Resources Center Project (College of Marin)	The project would construct a three-story, 77,000-square-foot replacement facility on the site of the existing building, to address seismic safety and provide upgraded facilities. The associated work would be limited to within the footprint of the existing building, and no alterations would occur to the adjacent pedestrian bridge.	The project currently is under construction.	The construction would take approximately 12 months.

In response to comment B1-21, page 4-15 in the Draft EIR has been revised as follows:

Cumulative Projects

Concurrent construction of the project with cumulative projects proposed within the same viewsheds could result in visual impacts during construction. Projects located within the same viewshed as the proposed project include the access ramp to Corte Madera Creek (#1), Lower Corte Madera Creek Improvement Study (#21), ~~and~~ Corte Madera Creek Project Phase II (#23), and the Learning Resources Center Project (#34).

In response to comment B1-21, page 4-16 in the Draft EIR has been revised as follows:

The Corte Madera Creek Project Phase II and Lower Corte Madera Creek Improvement Study would be located near the Lower College of Marin Project's concrete channel removal. Additional removal of the concrete channel and flood-control improvements to areas downstream of the concrete channel would appear consistent with the proposed concrete -channel removal and would result in a beneficial aesthetic impact. The Learning Resources Center Project would be constructed before the proposed project and would be in proximity to the floodwall. The new Learning Resources Center would be three stories in height and would appear similar to the existing two-story building at the project site and within the overall context of the college. The proposed increase in floodwall height also would appear similar to the existing floodwall; therefore, the cumulative aesthetic impact from addition of the floodwall and Learning Resource Center would be less than significant. ~~The cumulative aesthetic impact would be less than significant.~~

Toxic Air Contaminants

The only cumulative projects proposed within 1,000 feet of the proposed project include the Access Ramp to Corte Madera Creek (#1), the Cedar Tentative Map (#11), the Corte

Madera Creek Project Phase II (#23), ~~and~~ the Sir Francis Drake Boulevard Rehabilitation (#24), and the Learning Resources Center Project (#34).

In response to comment B1-21, page 4-17 in the Draft EIR has been revised as follows:

Toxic Air Contaminants

The cumulative projects and the proposed project would generate toxic air contaminants (TACs) during construction and operation. The proposed project would include a new generator, but the generator would only be used up to 50 hours per year and would not be a considerable source of TACs. Construction of the Learning Resources Center Project would be completed before the proposed project and would not contribute to cumulative TACs because it would not generate TACs during the same time frame as the proposed project's construction. The Access Ramp to Corte Madera Creek and Sir Francis Drake Boulevard Rehabilitation would be constructed a year prior to the proposed project.

In response to comment B1-21, page 4-21 in the Draft EIR has been revised as follows:

The only cumulative projects located close enough to the proposed project to result in cumulative impacts on cultural resources are the Access Ramp to Corte Madera Creek (#1), ~~and~~ Corte Madera Creek Project Phase II (#23), and the Learning Resources Center Project (#34). The remaining projects are separated from the project by a considerable distance, with intervening developed areas.

In response to comment B1-21, page 4-23 in the Draft EIR has been revised as follows:

Cumulative Projects

The Access Ramp to Corte Madera Creek (#1), Cedar Tentative Map (#11), Lower Corte Madera Creek Improvement Study (#21), Corte Madera Creek Project Phase II (#23), ~~and~~ Sir Francis Drake Boulevard Rehabilitation Project (#24), and the Learning Resources Center Project (#34) would occur in proximity to portions of the project.

In response to comment B1-21, page 4-24 in the Draft EIR has been revised as follows:

Cumulative Projects

The cumulative projects identified in Table 4.3-1 would likely require transport of hazardous materials on Highway 101 and Sir Francis Drake Boulevard during construction. Construction of cumulative projects #1 through #5, #16, #18, ~~and~~ #22 through #25, and #34 would require transport of small volumes of hazardous materials for vehicle and equipment operations during construction.

In response to comment B1-21, page 4-25 in the Draft EIR has been revised as follows:

Handle Hazardous Materials within 0.25 Mile of Schools

As discussed in Section 3.8 Hazards and Hazardous Materials, the project is located within 0.25 mile of three schools. The only cumulative projects located within 0.25 mile

of the same schools include the Access Ramp to Corte Madera Creek (#1), ~~and~~ Corte Madera Creek Project Phase II (#23), and the Learning Resources Center Project (#34).

In response to comment B1-21, page 4-30 in the Draft EIR has been revised as follows:

Cumulative Projects

The Access Ramp to Corte Madera Creek (#1), the Cedar Tentative Map (#11), the Lower Corte Madera Creek Improvement Study (#21), Corte Madera Creek Project Phase II (#23), ~~and~~ Sir Francis Drake Boulevard Rehabilitation Project (#24), and the Learning Resources Center Project (#34) are located within 1,000 feet of portions of the project.

Noise and Vibration

The proposed project and cumulative projects would only generate substantial noise and vibration during the construction phase. Cumulative noise and vibration impacts would, therefore, only occur if the proposed project and cumulative projects within 1,000 feet of the proposed project were constructed at the same time. The access ramp to Corte Madera Creek, ~~and~~ Sir Francis Drake Boulevard Rehabilitation, and Learning Resources Center Project would be constructed prior to the proposed project and would not cause a cumulative noise impact.

In response to comment B1-21, page 4-34 in the Draft EIR has been revised as follows:

Cumulative Projects

Several of the cumulative projects will require removal of trees, including the following:

- San Anselmo Creek flood control – nursery basin site (#3)
- Hillview pump station and stormdrain (#5)
- Brownridge tree removal (#12)
- Cooney tree removal (#14)
- Real Equity tree removal (#20)
- Lower Sleepy Hollow Creek Improvements (#22)
- Corte Madera Creek Project Phase II (#23)
- Learning Resources Center Project (#34)

Cumulative Projects

Cumulative projects located within the geographic scope of analysis include the Winship Avenue Bridge Replacement Project (#6), the access ramp to Corte Madera Creek (#1), a number of minor structures, tree removal, and land-use modifications (projects #7 #8, #9, #10, #11, #12, #13, #15, #17, #19, and #20), ~~and~~ the Marin Health Care District, and the Learning Resources Center Project (#34).

A staff-initiated text change has been made to page 4-34 in the Draft EIR as follows:

Cumulative Impact

The cumulative projects identified in **Error! Reference source not found.** are required to obtain a permit from Marin County or other local jurisdictions for removal of trees

greater than 6 inches diameter at breast height. The County and local tree permits require replacement plantings for trees that will be removed by the cumulative projects. Compliance with the mitigation included in each project's tree removal permit will result in replacement of trees removed by cumulative projects. The cumulative projects in combination with the proposed project would not result in a cumulative impact on forestry resources because each of the cumulative projects would provide mitigation to offset the trees removed. The cumulative impact would be less than significant. ~~Land Use and Planning~~

4.4.16 Land Use and Planning

3.2.7 Alternatives

In response to comment A5-32, page 5-16 of the Draft EIR has been revised as follows:

> The No Project Alternative would avoid the proposed project's impact on GHG resulting from use of off-road construction equipment and vehicles during project construction and would avoid GHG emissions from operation of the emergency generator and energy use at the stormwater pump station. The No Project Alternative would have minimal greenhouse gas emissions during maintenance of existing facilities, like the proposed project. However, the No Project Alternative would not involve creation of natural riparian habitat and would not create the greenhouse gas emission reduction benefits of the proposed project.

In response to comments A5-32 and A5-33, page 5-24 in the Draft EIR has been revised as follows:

> ***Comparison of Impacts to the Proposed Project***
>
> Alternative 1 would involve the same type of equipment as that used by the proposed project, but the construction schedule would be shorter under Alternative 1 because no construction would occur in Frederick Allen Park. The number of construction truck trips under this alternative also would be ~~slightly~~ lower than the proposed project because of avoidance of Frederick Allen Park, which would reduce the construction GHG emissions. Operational GHG emissions under Alternative 1 would be ~~the same as~~ greater than the proposed project because Alternative 1 would not remove the concrete channel and would not include as much vegetation in Frederick Allen Park. Temporary GHG emission impacts associated with implementation of Alternative 1 would be less than that of the proposed project, but Alternative 1 would have reduced long-term GHG reduction benefits than the proposed project.

In response to comment A5-32, page 5-37 of the Draft EIR has been revised as follows:

> Alternative 1 would have less long-term benefits to aesthetics, biological resources, geology and soils, greenhouse gases, hydrology and water quality, and recreation than

the proposed project because Alternative 1 would not include creation of a natural creek channel, floodplain, and riparian habitat in Frederick Allen Park.

In response to comment A5-32, page 5-41 is revised as follows:

Alternative 2 Impacts

Alternative 2 would require use of construction equipment to construct the boardwalk and maintenance access path. Implementation of Alternative 2 in combination with the proposed project elements in other areas would result in generation of air quality and GHG emissions equivalent to the proposed project, including emissions of toxic air contaminants because the boardwalk and maintenance path would be constructed in lieu of the paved pathway and unpaved access to the creek. Implementation of Mitigation Measures 3.3-2 and Mitigation Measure 3.3-3, which would require implementation of dust control measures and use of USEPA or CARB Tier 3 or higher rated equipment would reduce the impact of Alternative 2 in combination with the proposed project in other areas to a less-than-significant level, similar to the project impact described in detail in Chapter 3. Alternative 2 would require removal of the same number of trees as the proposed project. Alternative 2 would allow increased planting relative to the proposed project because light and water could penetrate the boardwalk, which would allow planting underneath it. <u>The increased planting would result in long-term GHG reduction benefits.</u>

In response to comment A5-32, page 5-47 in the Draft EIR has been revised as follows:

Air Quality and Greenhouse Gases

Alternative 3 would involve the use of construction equipment and vehicles that would result in temporary GHG emissions, similar to the proposed project. The amount of equipment and vehicle use, as well as fugitive dust and GHG emissions associated with Alternative 3 could be slightly higher than the proposed project because of the increased project footprint and associated number of truck trips for material import and export in Unit 2. Implementation of Mitigation Measure 3.2-1 would reduce the impacts to a less-than-significant level. The alternative would comply with all applicable BAAQMD rules and regulations and would not result in extended exposure of nearby residences to criteria air pollutants or toxic air contaminants. Operational air quality <u>and GHG emissions</u> impacts would be the similar to the proposed project because maintenance activities are anticipated to be similar and infrequent.

In response to comment A5-32, Table 5.4-1 on page 5-54 is revised as follows:

Table 5.4-1 Comparison of Alternatives and Environmental Considerations

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
Greenhouse Gas (GHG) Emissions	LTS impact from GHG emissions	No Impact	LTS < ≥ The reduced construction in Frederick Allen Park would result in reduced GHG emissions during construction, but the alternative would not achieve the long-term GHG reduction emissions.	LTS = ≤ The construction intensity would be similar to the proposed project and would have similar GHG emissions. The alternative would have greater GHG reduction benefits.	LTS > The floodwall construction in Unit 2 would result in slightly greater hauling of material and slightly increased GHG emissions, compared to the proposed project.

3.2.8 Report Preparation

No revisions were made to this section.

3.2.9 Appendices

In response to comment A5-34, page G-3 of Appendix G has been revised as follows:

Implementation Timing
• Prior to construction • During construction • After construction

In response to comment A5-1, Table G-1 Mitigation Measures of Appendix G (page G-15) has been revised as follows:

Significant Environmental Impact	Mitigation Measure	Application Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
Impact 3.1-3: The project would substantially degrade the existing visual character or quality of public views of the site and its surroundings	**Mitigation Measure 3.1-3: Large Tree Planting**. The District will integrate ~~large box trees~~ 24-inch or 36-inch box trees into the final planting plan and design for Frederick Allen Park, to the extent ecologically appropriate for the proposed species. The Town of Ross will provide the desired size and species of trees to the District. The final planting plan will be provided to the Town of Ross for review and approval ~~comment~~ no less than 90 days prior to landscaping. The District will be responsible for maintaining replacement trees until they become established and for replacing dead trees for a period of no less than 10 years.	• Frederick Allen Park	• Planting plan submitted to Town of Ross for review • Large box trees are planted where feasible	• Marin County Flood Control and Water Conservation District (District) • Contractor	• Prior to construction submit planting plan to Town and obtain Town approval • During construction implement planting plan • Post-construction monitor tree success and maintain trees		
Impact 3.4-2: The project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	**Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources.** If evidence of any subsurface archaeological features or deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find, and the finds shall be protected until they are examined by a qualified archaeologist. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone-milling equipment (e.g., mortars, pestles, handstones, milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls and deposits of metal, glass, and/or ceramic refuse. The District shall retain a qualified archaeologist who meets the U.S. Secretary of the Interiors professional qualifications in archaeology to assess the significance of the find and make recommendations for further evaluation and treatment as necessary. A Native American representative from a traditionally and	• Any locations where archaeological deposits are encountered	• Halt work within 50 feet of a find and contact archaeologist.	• District • Construction contractor • Qualified archaeologist	• Plan prepared prior to construction • Avoidance and treatment implemented during construction, as needed.		

Significant Environmental Impact	Mitigation Measure	Application Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	culturally affiliated tribe will be notified and invited to assess the find if the artifacts are of Native American ancestry and determined to be more than an isolated find. If the discovery is in an area below Stadium Way and on lands under the jurisdiction of California State Lands Commission, that agency shall be notified. Any treatments and disposition of any artifacts uncovered under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission before the treatment is implemented. If, after evaluation, a resource is considered a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in PRC Section 21074), all preservation options shall be considered as required by CEQA (see CEQA Guidelines Section 15126.4 and PRC 21084.3), including possible capping, data recovery, mapping, or avoidance of the resource. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil. Work in the area may resume, at the direction of the District, upon completion of treatment. An Unanticipated Discoveries Evaluation and Treatment Plan shall be prepared before construction that details the procedures for dealing with unanticipated discoveries, including procedures that would be implemented for such discoveries that cannot be protected in place. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.						

Significant Environmental Impact	Mitigation Measure	Application Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
Impact 3.12-3: The project could affect existing recreational opportunities.	**Mitigation Measure ~~3.1-2~~ 3.1-3: Large Tree Planting (see Aesthetics and Visual Resources above)**	• See above	• See above	• The District • Contractor	• Prior to construction • During construction		
Impact 3.13-1: The project could conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	**Mitigation: Mitigation Measure 3.13-1: Traffic Management** Prior to initiation of construction, the Project contractor(s) shall use a qualified traffic engineer to prepare a Traffic Management Plan (TMP). The TMP shall be developed on the basis of detailed design plans. The TMP shall be reviewed and approved by the District and agencies with jurisdiction over roadways affected by project construction activities prior to construction. Once approved, the TMP shall be incorporated into the contract documents specification. The TMP shall include, but not necessarily be limited to, the elements listed below: • Develop a detour plan for bicycle and pedestrian traffic that shows the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin Parking lot to Ross Common. • Post temporary Bike Route 20 detour and associated signage that meets all the accessibility requirements stated under the Americans with Disabilities Act and CBC Title 24. • Post signs providing public notice of detours at least ~~14~~ 20 days prior to temporary bike route closure. • Provide flaggers at the tennis courts within Frederick Allen Park to provide safe pedestrian access to the tennis courts. • Control and monitor construction-vehicle movements by enforcing standard construction specifications through periodic on-site inspections. • Install traffic-control devices where traffic conditions warrant, as specified in the applicable jurisdiction's standards (e.g., the California Manual on Uniform Traffic Control Devices; Part 6: Temporary Traffic Control); flaggers would be used, when warranted, to control vehicle movements.	• Bike Route 20 closure/detour area • Frederick Allen Park • College Avenue • Laurel Avenue • Staging areas • ~~All areas~~	• TMP prepared • Notified public regarding construction activities and traffic impacts • Traffic control measures including detours implemented • Traffic control devices installed • Comply with roadside safety protocols • Emergency vehicle access maintained at all times • Equipment stored in designated areas to avoid obstructing traffic	• Construction • Qualified traffic engineer	• Prior to construction prepare TMP • During construction implement flaggers and traffic controls per the measure		

Significant Environmental Impact	Mitigation Measure	Application Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	• Implement a public information program to notify interested parties of the impending construction activities using means such as print media, radio, and/or web-based messages and information. • Comply with roadside safety protocols to reduce the risk of accidents. • Maintain access for emergency vehicles at all times. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways. • Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner as to minimize obstruction to traffic.						

4 References

California Ocean Protection Council. (2018, March 14). State of California Sea-Level Rise Guidance. Retrieved from https://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf

Geomorph Design Group. (2020, November 23). Lower COM Corte Madera Creek Restoration Project 65% Design Basis Report.

GHD. (2020). Parks in the Proposed Project Area GIS Dataset.

GHD. (2020). Project Elements for the Corte Madera Creek Flood Control Project GIS dataset.

GHD. (2020, October 23). Scenario B2 Hydraulic Modeling.

GHD. (2021, May 12). Alternative 1 Water Surface Elevation Change Figures.

Golden Gate National Parks Conservancy. (2018, June). Orthoimagery of the Marin County Imagery Study Area. *Marin_County_Mosaic.sid*.

Marie Bowman v. City of Berkeley , A105000 (Court of Appeal, First District, Division Four July 20, 2005).

Mira Mar Mobile Community v. City of Oceanside , D042070 (Court of Appeal, Fourth District, Division One May 17, 2004).

MMWD. (2020). Marin Water District Fact Sheet. Retrieved February 3, 2021

Porterville Citizens for Responsible Hillside Development v. City of Porterville , F051953 (Court of Appeal, Fifth District November 9, 2007).

Preserve Poway v. City of Poway, D067645 (Court of Appeals of California, Fourth District, Division One July 27, 2016).

Prunuske Chatham, Inc. (2020, May). Proposed Revegetation Plan for Lower Corte Madera Creek Concrete Channel Removal Project.

Tele Atlas North America, Inc. (2019). U.S. and Canada Detailed Streets GIS dataset. *ESRI® Data & Maps: StreetMap™*. ESRI.

Town of Ross. (2021, March 11). Corte Madera Creek Flood Risk Management Project, Phase 1Town Comment and Review of the Draft EIR.

Town of Ross. (2021). *Corte Madera Creek Flood Risk Management, Phase 1 Town Council Selection of Preferred Option for Frederick Allen Park.*

U.S. Department of Transportation Federal Highway Administration. (2015, Januaray 1). Guidelines for the Visual Impact Assessment of Highway Projects. Retrieved from https://blmwyomingvisual.anl.gov/docs/VIA_Guidelines_for_Highway_Projects.pdf

USGS. (2012). National Hydrography Dataset.

Marin County Flood Control and Water Conservation District

Corte Madera Creek Flood Risk Management Project, Phase 1

Final Environmental Impact Report

Volume 2: Revisions to the Draft Environmental Impact Report

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PANORAMA ENVIRONMENTAL, INC.

Marin County Flood Control and Water Conservation District

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Table of Contents

Executive Summary **ES-1**
ES.1 Summary of Project ES-1
ES.2 Summary of Impacts and Mitigation Measures ES-2
ES.3 Summary of Significant and Unavoidable, Growth-Inducing, and Cumulative Impacts ES-9
ES.4 Summary of Plan and Policy Consistency ES-10
ES.5 Summary of Alternatives to the Project ES-10
ES.6 Significant Irreversible Environmental Changes ES-12
ES.7 Areas of Known Controversy ES-12
ES.8 Major Conclusions and Issues to be Resolved ES-14
ES.9 Other Social and Economic Impacts Found not to be Significant ES-16
ES.10 Mitigation Monitoring and Reporting Program ES-16
ES.11 References ES-31

Acronyms, Abbreviations, and Glossary ..... **i**
Acronyms and Abbreviations i
Glossary viii

1 Introduction **1-1**
1.1 Planning and Project Review Process 1-1
1.2 Project History 1-2
1.3 Purpose of the EIR and Approach to Environmental Analysis 1-4
1.4 Responsible and Trustee Agencies 1-4
1.5 Notice of Preparation and Scoping 1-6
1.6 Organization of the EIR 1-8

2 Project Description **2-1**
2.1 Introduction 2-1
2.2 Project Location 2-1
2.3 Background 2-4
2.4 Project Objectives 2-7
2.5 Project Elements and Design 2-8
2.6 Project Construction 2-26

2.7 Project Operation and Maintenance 2-42
2.8 Permits and Approvals 2-45
2.9 Distinction Between Review of Environmental Issues and Project Merits 2-46
2.10 References 2-46

3 Environmental Setting, Impacts, and Mitigation Measures 3-1
3.0 Introduction 3-1
3.1 Aesthetics and Visual Resources 3.1-1
3.2 Air Quality 3.2-1
3.3 Biological Resources 3.3-1
3.4 Cultural Resources 3.4-1
3.5 Energy 3.5-1
3.6 Geology and Soils 3.6-1
3.7 Greenhouse Gas Emissions 3.7-1
3.8 Hazards and Hazardous Materials 3.8-1
3.9 Hydrology and Water Quality 3.9-1
3.10 Noise 3.10-1
3.11 Public Services 3.11-1
3.12 Recreation 3.12-1
3.13 Transportation and Circulation 3.13-1
3.14 Tribal Cultural Resources 3.14-1
3.15 Utilities and Service Systems 3.15-1
3.16 Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics 3.16-1

4 Growth-Inducing and Cumulative Effects 4-1
4.1 Growth Inducement Potential and Secondary Effects of Growth 4-1
4.2 Significant Irreversible Changes 4-1
4.3 Cumulative Impacts 4-2
4.4 Cumulative Impact Analysis 4-15
4.5 References 4-35

5 Alternatives 5-1
5.1 Introduction 5-1
5.2 Approach to Alternatives Selection 5-2
5.3 Alternatives Selected for Analysis in the EIR 5-13
5.4 Comparison of Alternatives 5-51

5.5 Environmentally Superior Alternative 5-59
5.6 References 5-59

6 Report Preparation 6-1
6.1 List of Preparers 6-1
6.2 Agencies and Organizations Contacted 6-3

List of Tables

Table ES-1 Summary of Scoping Comments and Areas of Potential Controversy ES-13
Table ES-~~1~~2 Summary of Impacts and Mitigation for the Project ES-17
Table 1.5-1 Summary of Scoping Comments 1-6
Table 2.2-1 Corte Madera Creek Units within the Project Area 2-4
Table 2.5-1 Proposed Project Elements by Creek Unit 2-14
Table 2.6-1 Temporary Work Area and Permanent Modifications by Element 2-26
Table 2.6-2 Tree Removal by Unit 2-28
Table 2.6-3 Estimated Cut and Fill Volumes 2-35
Table 2.6-4 Tree Planting List 2-38
Table 2.6-5 Construction Schedule 2-39
Table 2.6-6 Project Truck Trip Estimates 2-42
Table 2.7-1 Construction Water Requirements 2-43
Table 2.8-1 Required Permits or Approvals for the Project 2-45
Table 3.1-1 Aesthetics and Visual Resources Scoping Comments 3.1-1
Table 3.1-2 Approach to Determining Significance of Visual Impacts 3.1-20
Table 3.2-1 Air Quality Scoping Comments 3.2-1
Table 3.2-2 NAAQS and CAAQS for Criteria Air Pollutants and SFBAAB Attainment Status 3.2-3
Table 3.2-3 Air Quality Data Summary (2014–2018) for the Project Vicinity 3.2-10
Table 3.2-4 Significance Thresholds 3.2-17
Table 3.2-5 Estimated Construction Emissions (Pounds) 3.2-23
Table 3.2-6 Estimated Average Daily Operational Emissions (Pounds/Day) 3.2-25
Table 3.2-7 Estimated Unmitigated Construction Health Risk 3.2-27
Table 3.2-8 Estimated Mitigated Construction Health Risk 3.2-27
Table 3.2-9 Estimated Unmitigated Operational Health Risk 3.2-28
Table 3.3-1 Biological Resources Scoping Comments 3.3-1
Table 3.3-2 Habitat Types within Project Area (acres) 3.3-13
Table 3.3-3 Special-Status Species with a Low, Moderate, or High Likelihood to Occur in the Project Area 3.3-20
Table 3.3-4 Sensitive Natural Communities with a Low, Moderate, or High Likelihood to Occur in the Project Area 3.3-26
Table 3.4-1 Cultural Resources Scoping Comments 1
Table 3.4-2 NWIC Records Search Results – Resources 8
Table 3.4-3 NWIC Records Search Results – Studies in the APE 9
Table 3.4-4 Built Environment Resources Identified by the USACE 12
Table 3.4-5 Built Environment Resources Evaluated for the Current Project 13
Table 3.6-1 Geology and Soils Scoping Comments 3.6-1

TABLE OF CONTENTS

Table 3.7-1	Greenhouse Gas Emissions Scoping Comments	3.7-1
Table 3.7-2	Greenhouse Gas Emissions Sources and GWP	3.7-4
Table 3.7-3	California Greenhouse Gas Inventory	3.7-5
Table 3.7-4	SFBAAB Greenhouse Gas Inventory	3.7-6
Table 3.7-5	SFBAAB Greenhouse Gas Inventory (Percent)	3.7-6
Table 3.7-6	Marin County Greenhouse Gas Inventory	3.7-7
Table 3.7-7	Estimated GHG Emissions (metric tons CO2e)	3.7-13
Table 3.7-8	Consistency with Applicable State Greenhouse Gas Reduction Strategies	3.7-15
Table 3.7-9	Consistency with Applicable Local Greenhouse Gas Reduction Policies, Actions, and Programs	3.7-16
Table 3.8-1	Hazards and Hazardous Materials Scoping Comments	3.8-1
Table 3.8-2	Hazardous Sites Within 0.25 Mile of Project Area	3.8-3
Table 3.9-1	Hydrology and Water Quality Scoping Comments	3.9-1
Table 3.9-2	Comparison of Peak Flood Discharges	3.9-17
Table 3.9-3	San Francisco Bay Sea Level Rise Estimates	3.9-20
Table 3.9-4	Beneficial Uses and Impairment Status	3.9-22
Table 3.9-5	Projects Included in Future Condition Scenarios	3.9-36
Table 3.9-6	Project Impacts on Beneficial Uses	3.9-53
Table 3.9-7	Summary of Project Flood Reduction Benefits, Existing Condition Scenario, 25-Year Event	3.9-62
Table 3.10-1	Noise Scoping Comments	1
Table 3.10-2	Approximate Relationship Between Increases in Environmental Noise Level and Human Perception	4
Table 3.10-3	Approximate Reaction of People and Damage to Buildings from Construction Vibration Levels	7
Table 3.10-4	Ambient Noise Levels at Noise Monitoring Locations	9
Table 3.10-5	Sensitive Receptors within 1,000 Feet of the Project Area	11
Table 3.10-6	Town of Ross and Marin County Municipal Code Construction Requirements	15
Table 3.10-7	Maximum Noise Levels Generated by Construction Equipment	16
Table 3.10-8	Estimated Noise from Equipment Required for Construction Phases	17
Table 3.10-9	Vibration Thresholds	22
Table 3.10-10	Vibration Velocities for Construction Equipment	22
Table 3.11-1	Public Services Scoping Comments	1
Table 3.12-1	Recreation Scoping Comments	3.12-1
Table 3.12-2	Parks and Recreational Facilities Located near the Town of Ross and Kentfield Area	3.12-5
Table 3.13-1	Transportation and Circulation Scoping Comments	1
Table 3.13-2	Applicable Transportation Programs, Plans, and Policies	9
Table 3.14-1	Tribal Cultural Resources Scoping Comments	1
Table 3.14-2	Native American AB 52 Consultation	2
Table 3.16-1	General Plan Land Use Designations and Zoning in Project Vicinity	3.16-3
Table 3.16-2	Population and Growth Rates of Marin County and Town of Ross	3.16-4
Table 3.16-3	Marin County Housing Demographics	3.16-4
Table 3.16-4	Applicable Land Use Policies Adopted to Avoid or Mitigate an Environmental Effect	3.16-16
Table 4.3-1	Projects Considered in Cumulative Impact Analysis	4-5

Table 4.4-1 Estimated Cumulative Health Risk at the Maximally Exposed Individual Receptor 4-18
Table 5.2-1 Alternatives Screening Results 5-7
Table 5.3-1 Alternatives Areas of Comparison 5-13
Table 5.3-2 Alternative 1 Estimated Unmitigated Construction Health Risk 5-22
Table 5.3-3 Alternative 1 Estimated Mitigated Construction Health Risk 5-22
Table 5.4-1 Comparison of Alternatives and Environmental Considerations 5-52
Table 6.1-1 Marin Flood Control District and Planning Department 6-1
Table 6.1-2 Consultant Teams 6-1
Table 6.2-1 Agencies and Organizations Consulted 6-3

List of Figures

Figure ES-1 Project Location ES-3
Figure ES-2 Project Elements (Map 1 of 3) ES-5
Figure ES-3 Project Elements (Map 2 of 3) ES-6
Figure ES-4 Project Elements (Map 3 of 3) ES-7
Figure 2.2-1 Project Location 2-2
Figure 2.2-2 USACE Creek Units 2-3
Figure 2.3-1 Ross Valley Flood Protection and Watershed Project Study Work Plan Timeline 2-5
Figure 2.3-2 Corte Madera Creek Historical Annual Peak Discharges 2-6
Figure 2.5-1 Project Elements (Map 1 of 3) 2-9
Figure 2.5-2 Project Elements (Map 2 of 3) 2-10
Figure 2.5-3 Project Elements (Map 3 of 3) 2-11
Figure 2.5-4 Frederick Allen Park Site Plan 2-17
Figure 2.5-5 Stormwater Pump Station Plan View 2-21
Figure 2.5-6 Stormwater Pump Station Cross-Section View 2-22
Figure 2.5-7 Proposed Fish Pool Design 2-24
Figure 2.5-8 Lower College of Marin Concrete Channel Removal Habitat Creation 2-25
Figure 2.6-1 Staging, Stockpile, and Temporary Work Areas 2-27
Figure 2.6-2 Tree Removal Unit 4 and Frederick Allen Park 2-29
Figure 2.6-3 Tree Removal Unit 3 2-30
Figure 2.6-4 Tree Removal Unit 2 2-31
Figure 2.6-5 Tree Removal Lower College of Marin Concrete Channel Removal Unit 2 2-32
Figure 2.6-6 Project Access 2-41
Figure 3.1-1 Representative Photograph and Key Observation Point Location Map 3.1-7
Figure 3.1-2 Photograph 1: View of Unit 4 from Lagunitas Road Bridge, Looking Southeast 3.1-8
Figure 3.1-3 Photograph 2: View of Unit 3, Frederick Allen Park, Looking Southeast 3.1-8
Figure 3.1-4 Photograph 3: View of Unit 3, Frederick Allen Park, Looking Southeast from Marin County Bicycle Route 20 ..... 3.1-8
Figure 3.1-5 Photograph 4: View of Upper Unit 3 Fish Pools from Kentfield Hospital Bridge, Looking Southeast 3.1-8
Figure 3.1-6 Photograph 5: View of Unit 3 From Marin County Bicycle Route 20, Looking Northeast at Proposed Pumping Station Location 3.1-9
Figure 3.1-7 Photograph 6: View of Lower Unit 3 from Science-Math-Nursing Building Bridge, Looking Northwest 3.1-9

Figure 3.1-8 Photograph 7: View of Unit 2 from Marin County Bicycle Route 20 near Stadium Way Bridge, Looking South 3.1-9
Figure 3.1-9 Photograph 8: View of Unit 2 from Bike Route 20, Looking South from Left Bank 3.1-9
Figure 3.1-10 Photograph 9: View of Unit 2 from Unnamed Path Adjacent to College of Marin Athletic Fields, Looking Northwest from Right Bank 3.1-10
Figure 3.1-11 KOP 1: Existing View of Frederick Allen Park, Unit 3 ..... 3.1-34
Figure 3.1-12 KOP 1: Visual Simulation of Frederick Allen Park, One Year After Construction 3.1-35
Figure 3.1-13 KOP 1: Simulation of Frederick Allen Park, 10 Years After Construction 3.1-36
Figure 3.1-14 KOP 1: Simulation of Frederick Allen Park, 20 Years After Construction 3.1-37
Figure 3.1-15 KOP 2: Existing View of Pump Station Location, Unit 3 ..... 3.1-38
Figure 3.1-16 KOP 2: Visual Simulation of Pump Station, Unit 3 ..... 3.1-39
Figure 3.1-17 KOP 3: Existing View of Floodwall Location, Unit 2 ..... 3.1-40
Figure 3.1-18 KOP 3: Visual Simulation of Floodwall with Trees Removed, Unit 2 ..... 3.1-41
Figure 3.1-19 KOP 3: Visual Simulation of Floodwall with Trees Retained, Unit 2 ..... 3.1-42
Figure 3.1-20 Existing View of Lower College of Marin Concrete Channel Removal, Unit 2 ..... 3.1-43
Figure 3.1-21 Visual Simulation of Lower College of Marin Concrete Channel Removal, Unit 2 ..... 3.1-44
Figure 3.2-1 San Francisco Bay Area Air Basin Boundary 3.2-8
Figure 3.2-2 Sensitive Receptors within 1,000 Feet of the Project Area 3.2-12
Figure 3.3-1 Habitat Types within Project Area (Map 1 of 3) 3.3-9
Figure 3.3-2 Habitat Types within Project Area (Map 2 of 3) 3.3-10
Figure 3.3-3 Habitat Types within Project Area (Map 3 of 3) 3.3-11
Figure 3.6-1 Geologic Units 3.6-4
Figure 3.6-2 Faults in the Local Region 3.6-9
Figure 3.9-1 Corte Madera Creek – Waterbodies in Project Vicinity 3.9-8
Figure 3.9-2 Corte Madera Creek Historical Peak Annual Discharge 3.9-16
Figure 3.9-3. Floodway and Tsunami Inundation Zones 3.9-18
Figure 3.9-4 Project Changes in Velocity from Future Conditions, 10-Year Flood Event 3.9-45
Figure 3.9-5 Project Changes in Velocity from Future Conditions, 25-Year Flood Event 3.9-46
Figure 3.9-6 Project Changes in Velocity from Future Conditions, 100-Year Event 3.9-47
Figure 3.9-7 Project Changes in Water Surface Elevation from Future Conditions, 10-Year Flood Event 3.9-57
Figure 3.9-8 Project Changes in Water Surface Elevation from Future Conditions, 25-Year Flood Event 3.9-58
Figure 3.9-9 Project Changes in Water Surface Elevation from Future Conditions, 100-Year Flood Event 3.9-59
Figure 3.9-10 Reduction in Water Surface Elevation by Parcel, Existing Condition 25-Year Flood Event 3.9-65
Figure 3.10-1 Typical Noise Levels 3.10-3
Figure 3.10-2 Point Source Spreading with Distance 3.10-5
Figure 3.10-3 Noise Measuring Sites and Sensitive Receptors within 1,000 Feet of the Project Area 3.10-10
Figure 3.12-1 Recreational Facilities 3.12-3
Figure 3.12-2 Parks and Recreational Facilities in the Project Area 3.12-4
Figure 3.13-1 Local Transportation Network 3.13-3
Figure 3.15-1 Utilities and Service Systems in the Project Area (Map 1 of 3) 3.15-3
Figure 3.15-2 Utilities and Service Systems in the Project Area (Map 2 of 3) 3.15-4

Figure 3.15-3 Utilities and Service Systems in the Project Area (Map 3 of 3) 3.15-5
Figure 4.3-1 Cumulative Projects Locations 4-14
Figure 5.3-1 Alternative 1: Reduced Footprint–Avoid Frederick Allen Park 5-20
Figure 5.3-2 Alternative 1 Changes in Velocity from Future Conditions - 10-Year Flood Event 5-27
Figure 5.3-3 Alternative 1 Changes in Velocity from Future Conditions - 25-Year Flood Event 5-28
Figure 5.3-4 Alternative 1 Changes in Velocity from Future Conditions - 100-Year Flood Event 5-29
Figure 5.3-5 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 10-Year Flood Event 5-30
Figure 5.3-6 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 25-Year Flood Event 5-31
Figure 5.3-7 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 100-Year Flood Event 5-32
Figure 5.3-8 Difference in Future Water Surface Elevation Between Alternative 1 and Proposed Project – 100-Year Flood Event 5-33
Figure 5.3-9 Alternative 2 Layout 5-39
Figure 5.3-10 Alternative 2 Visual Representation Looking North from the Tennis Courts at Frederick Allen Park 5-40

List of Appendices

Appendix A Notice of Preparation and Scoping Summary Report

Appendix B Tree Removal Table and Landscaping Planting Plans

Appendix C Air Quality Supporting Information

Appendix D Biolological Resouces Supporting Information

Appendix E Supplemental Water Surface Elevation Change Maps

Appendix F Tribal Consultation Supporting Information

Appendix G Mitigaiton Monitoring and Reporting Program

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Table of Contents

Executive Summary **ES-1**
ES.1 Summary of Project ES-1
ES.2 Summary of Impacts and Mitigation Measures ES-2
ES.3 Summary of Significant and Unavoidable, Growth-Inducing, and Cumulative Impacts ES-9
ES.4 Summary of Plan and Policy Consistency ES-10
ES.5 Summary of Alternatives to the Project ES-10
ES.6 Significant Irreversible Environmental Changes ES-12
ES.7 Areas of Known Controversy ES-12
ES.8 Major Conclusions and Issues to be Resolved ES-14
ES.9 Other Social and Economic Impacts Found not to be Significant ES-16
ES.10 Mitigation Monitoring and Reporting Program ES-16
ES.11 References ES-31

Acronyms, Abbreviations, and Glossary ..... **i**
Acronyms and Abbreviations i
Glossary viii

1 Introduction **1-1**
1.1 Planning and Project Review Process 1-1
1.2 Project History 1-2
1.3 Purpose of the EIR and Approach to Environmental Analysis 1-4
1.4 Responsible and Trustee Agencies 1-4
1.5 Notice of Preparation and Scoping 1-6
1.6 Organization of the EIR 1-8

2 Project Description **2-1**
2.1 Introduction 2-1
2.2 Project Location 2-1
2.3 Background 2-4
2.4 Project Objectives 2-7
2.5 Project Elements and Design 2-8
2.6 Project Construction 2-26

TABLE OF CONTENTS

2.7 Project Operation and Maintenance 2-42
2.8 Permits and Approvals 2-45
2.9 Distinction Between Review of Environmental Issues and Project Merits 2-46
2.10 References 2-46

3 Environmental Setting, Impacts, and Mitigation Measures 3-1
3.0 Introduction 3-1
3.1 Aesthetics and Visual Resources 3.1-1
3.2 Air Quality 3.2-1
3.3 Biological Resources 3.3-1
3.4 Cultural Resources 3.4-1
3.5 Energy 3.5-1
3.6 Geology and Soils 3.6-1
3.7 Greenhouse Gas Emissions 3.7-1
3.8 Hazards and Hazardous Materials 3.8-1
3.9 Hydrology and Water Quality 3.9-1
3.10 Noise 3.10-1
3.11 Public Services 3.11-1
3.12 Recreation 3.12-1
3.13 Transportation and Circulation 3.13-1
3.14 Tribal Cultural Resources 3.14-1
3.15 Utilities and Service Systems 3.15-1
3.16 Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics 3.16-1

4 Growth-Inducing and Cumulative Effects 4-1
4.1 Growth Inducement Potential and Secondary Effects of Growth 4-1
4.2 Significant Irreversible Changes 4-1
4.3 Cumulative Impacts 4-2
4.4 Cumulative Impact Analysis 4-15
4.5 References 4-35

5 Alternatives 5-1
5.1 Introduction 5-1
5.2 Approach to Alternatives Selection 5-2
5.3 Alternatives Selected for Analysis in the EIR 5-13
5.4 Comparison of Alternatives 5-51

5.5 Environmentally Superior Alternative 5-59
5.6 References 5-59

6 Report Preparation 6-1
6.1 List of Preparers 6-1
6.2 Agencies and Organizations Contacted 6-3

List of Tables

Table ES-1 Summary of Scoping Comments and Areas of Potential Controversy ES-13
Table ES-~~1~~2 Summary of Impacts and Mitigation for the Project ES-17
Table 1.5-1 Summary of Scoping Comments 1-6
Table 2.2-1 Corte Madera Creek Units within the Project Area 2-4
Table 2.5-1 Proposed Project Elements by Creek Unit 2-14
Table 2.6-1 Temporary Work Area and Permanent Modifications by Element 2-26
Table 2.6-2 Tree Removal by Unit 2-28
Table 2.6-3 Estimated Cut and Fill Volumes 2-35
Table 2.6-4 Tree Planting List 2-37
Table 2.6-5 Construction Schedule 2-38
Table 2.6-6 Project Truck Trip Estimates 2-42
Table 2.7-1 Construction Water Requirements 2-43
Table 2.8-1 Required Permits or Approvals for the Project 2-45
Table 3.1-1 Aesthetics and Visual Resources Scoping Comments 3.1-1
Table 3.1-2 Approach to Determining Significance of Visual Impacts 3.1-20
Table 3.2-1 Air Quality Scoping Comments 3.2-1
Table 3.2-2 NAAQS and CAAQS for Criteria Air Pollutants and SFBAAB Attainment Status 3.2-3
Table 3.2-3 Air Quality Data Summary (2014–2018) for the Project Vicinity 3.2-10
Table 3.2-4 Significance Thresholds 3.2-17
Table 3.2-5 Estimated Construction Emissions (Pounds) 3.2-23
Table 3.2-6 Estimated Average Daily Operational Emissions (Pounds/Day) 3.2-25
Table 3.2-7 Estimated Unmitigated Construction Health Risk 3.2-27
Table 3.2-8 Estimated Mitigated Construction Health Risk 3.2-27
Table 3.2-9 Estimated Unmitigated Operational Health Risk 3.2-28
Table 3.3-1 Biological Resources Scoping Comments 3.3-1
Table 3.3-2 Habitat Types within Project Area (acres) 3.3-13
Table 3.3-3 Special-Status Species with a Low, Moderate, or High Likelihood to Occur in the Project Area 3.3-20
Table 3.3-4 Sensitive Natural Communities with a Low, Moderate, or High Likelihood to Occur in the Project Area 3.3-26
Table 3.4-1 Cultural Resources Scoping Comments 3.4-1
Table 3.4-2 NWIC Records Search Results – Resources 3.4-8
Table 3.4-3 NWIC Records Search Results – Studies in the APE 3.4-9
Table 3.4-4 Built Environment Resources Identified by the USACE 3.4-12
Table 3.4-5 Built Environment Resources Evaluated for the Current Project 3.4-13
Table 3.6-1 Geology and Soils Scoping Comments 3.6-1

TABLE OF CONTENTS

Table 3.7-1	Greenhouse Gas Emissions Scoping Comments	3.7-1
Table 3.7-2	Greenhouse Gas Emissions Sources and GWP	3.7-4
Table 3.7-3	California Greenhouse Gas Inventory	3.7-5
Table 3.7-4	SFBAAB Greenhouse Gas Inventory	3.7-6
Table 3.7-5	SFBAAB Greenhouse Gas Inventory (Percent)	3.7-6
Table 3.7-6	Marin County Greenhouse Gas Inventory	3.7-7
Table 3.7-7	Estimated GHG Emissions (metric tons CO2e)	3.7-13
Table 3.7-8	Consistency with Applicable State Greenhouse Gas Reduction Strategies	3.7-15
Table 3.7-9	Consistency with Applicable Local Greenhouse Gas Reduction Policies, Actions, and Programs	3.7-16
Table 3.8-1	Hazards and Hazardous Materials Scoping Comments	3.8-1
Table 3.8-2	Hazardous Sites Within 0.25 Mile of Project Area	3.8-3
Table 3.9-1	Hydrology and Water Quality Scoping Comments	3.9-1
Table 3.9-2	Comparison of Peak Flood Discharges	3.9-17
Table 3.9-3	San Francisco Bay Sea Level Rise Estimates	3.9-20
Table 3.9-4	Beneficial Uses and Impairment Status	3.9-22
Table 3.9-5	Projects Included in Future Condition Scenarios	3.9-36
Table 3.9-6	Project Impacts on Beneficial Uses	3.9-53
Table 3.9-7	Summary of Project Flood Reduction Benefits, Existing Condition Scenario, 25-Year Event	3.9-62
Table 3.10-1	Noise Scoping Comments	3.10-1
Table 3.10-2	Approximate Relationship Between Increases in Environmental Noise Level and Human Perception	3.10-4
Table 3.10-3	Approximate Reaction of People and Damage to Buildings from Construction Vibration Levels	3.10-7
Table 3.10-4	Ambient Noise Levels at Noise Monitoring Locations	3.10-9
Table 3.10-5	Sensitive Receptors within 1,000 Feet of the Project Area	3.10-11
Table 3.10-6	Town of Ross and Marin County Municipal Code Construction Requirements	3.10-15
Table 3.10-7	Maximum Noise Levels Generated by Construction Equipment	3.10-16
Table 3.10-8	Estimated Noise from Equipment Required for Construction Phases	3.10-17
Table 3.10-9	Vibration Thresholds	3.10-22
Table 3.10-10	Vibration Velocities for Construction Equipment	3.10-22
Table 3.11-1	Public Services Scoping Comments	3.11-1
Table 3.12-1	Recreation Scoping Comments	3.12-1
Table 3.12-2	Parks and Recreational Facilities Located near the Town of Ross and Kentfield Area	3.12-5
Table 3.13-1	Transportation and Circulation Scoping Comments	3.13-1
Table 3.13-2	Applicable Transportation Programs, Plans, and Policies	3.13-9
Table 3.14-1	Tribal Cultural Resources Scoping Comments	3.14-1
Table 3.14-2	Native American AB 52 Consultation	3.14-2
Table 3.16-1	General Plan Land Use Designations and Zoning in Project Vicinity	3.16-3
Table 3.16-2	Population and Growth Rates of Marin County and Town of Ross	3.16-4
Table 3.16-3	Marin County Housing Demographics	3.16-4
Table 3.16-4	Applicable Land Use Policies Adopted to Avoid or Mitigate an Environmental Effect	3.16-16
Table 4.3-1	Projects Considered in Cumulative Impact Analysis	4-5

Table 4.4-1 Estimated Cumulative Health Risk at the Maximally Exposed Individual Receptor 4-18
Table 5.2-1 Alternatives Screening Results 5-7
Table 5.3-1 Alternatives Areas of Comparison 5-13
Table 5.3-2 Alternative 1 Estimated Unmitigated Construction Health Risk 5-22
Table 5.3-3 Alternative 1 Estimated Mitigated Construction Health Risk 5-22
Table 5.4-1 Comparison of Alternatives and Environmental Considerations 5-52
Table 6.1-1 Marin Flood Control District and Planning Department 6-1
Table 6.1-2 Consultant Teams 6-1
Table 6.2-1 Agencies and Organizations Consulted 6-3

List of Figures

Figure ES-1 Project Location ES-3
Figure ES-2 Project Elements (Map 1 of 3) ES-5
Figure ES-3 Project Elements (Map 2 of 3) ES-6
Figure ES-4 Project Elements (Map 3 of 3) ES-7
Figure 2.2-1 Project Location 2-2
Figure 2.2-2 USACE Creek Units 2-3
Figure 2.3-1 Ross Valley Flood Protection and Watershed Project Study Work Plan Timeline 2-5
Figure 2.3-2 Corte Madera Creek Historical Annual Peak Discharges 2-6
Figure 2.5-1 Project Elements (Map 1 of 3) 2-9
Figure 2.5-2 Project Elements (Map 2 of 3) 2-10
Figure 2.5-3 Project Elements (Map 3 of 3) 2-11
Figure 2.5-4 Frederick Allen Park Site Plan 2-17
Figure 2.5-5 Stormwater Pump Station Plan View 2-21
Figure 2.5-6 Stormwater Pump Station Cross-Section View 2-22
Figure 2.5-7 Proposed Fish Pool Design 2-24
Figure 2.5-8 Lower College of Marin Concrete Channel Removal Habitat Creation 2-25
Figure 2.6-1 Staging, Stockpile, and Temporary Work Areas 2-27
Figure 2.6-2 Tree Removal Unit 4 and Frederick Allen Park 2-29
Figure 2.6-3 Tree Removal Unit 3 2-30
Figure 2.6-4 Tree Removal Unit 2 2-31
Figure 2.6-5 Tree Removal Lower College of Marin Concrete Channel Removal Unit 2 2-32
Figure 2.6-6 Project Access 2-41
Figure 3.1-1 Representative Photograph and Key Observation Point Location Map 3.1-7
Figure 3.1-2 Photograph 1: View of Unit 4 from Lagunitas Road Bridge, Looking Southeast 3.1-8
Figure 3.1-3 Photograph 2: View of Unit 3, Frederick Allen Park, Looking Southeast 3.1-8
Figure 3.1-4 Photograph 3: View of Unit 3, Frederick Allen Park, Looking Southeast from Marin County Bicycle Route 20 ..... 3.1-8
Figure 3.1-5 Photograph 4: View of Upper Unit 3 Fish Pools from Kentfield Hospital Bridge, Looking Southeast 3.1-8
Figure 3.1-6 Photograph 5: View of Unit 3 From Marin County Bicycle Route 20, Looking Northeast at Proposed Pumping Station Location 3.1-9
Figure 3.1-7 Photograph 6: View of Lower Unit 3 from Science-Math-Nursing Building Bridge, Looking Northwest 3.1-9

Figure 3.1-8 Photograph 7: View of Unit 2 from Marin County Bicycle Route 20 near Stadium Way Bridge, Looking South 3.1-9
Figure 3.1-9 Photograph 8: View of Unit 2 from Bike Route 20, Looking South from Left Bank 3.1-9
Figure 3.1-10 Photograph 9: View of Unit 2 from Unnamed Path Adjacent to College of Marin Athletic Fields, Looking Northwest from Right Bank 3.1-10
Figure 3.1-11 KOP 1: Existing View of Frederick Allen Park, Unit 3 ..... 3.1-34
Figure 3.1-12 KOP 1: Visual Simulation of Frederick Allen Park, One Year After Construction 3.1-35
Figure 3.1-13 KOP 1: Simulation of Frederick Allen Park, 10 Years After Construction 3.1-36
Figure 3.1-14 KOP 1: Simulation of Frederick Allen Park, 20 Years After Construction 3.1-37
Figure 3.1-15 KOP 2: Existing View of Pump Station Location, Unit 3 ..... 3.1-38
Figure 3.1-16 KOP 2: Visual Simulation of Pump Station, Unit 3 ..... 3.1-39
Figure 3.1-17 KOP 3: Existing View of Floodwall Location, Unit 2 ..... 3.1-40
Figure 3.1-18 KOP 3: Visual Simulation of Floodwall with Trees Removed, Unit 2 ..... 3.1-41
Figure 3.1-19 KOP 3: Visual Simulation of Floodwall with Trees Retained, Unit 2 ..... 3.1-42
Figure 3.1-20 Existing View of Lower College of Marin Concrete Channel Removal, Unit 2 ..... 3.1-43
Figure 3.1-21 Visual Simulation of Lower College of Marin Concrete Channel Removal, Unit 2 ..... 3.1-44
Figure 3.2-1 San Francisco Bay Area Air Basin Boundary 3.2-8
Figure 3.2-2 Sensitive Receptors within 1,000 Feet of the Project Area 3.2-12
Figure 3.3-1 Habitat Types within Project Area (Map 1 of 3) 3.3-9
Figure 3.3-2 Habitat Types within Project Area (Map 2 of 3) 3.3-10
Figure 3.3-3 Habitat Types within Project Area (Map 3 of 3) 3.3-11
Figure 3.6-1 Geologic Units 3.6-4
Figure 3.6-2 Faults in the Local Region 3.6-9
Figure 3.9-1 Corte Madera Creek – Waterbodies in Project Vicinity 3.9-8
Figure 3.9-2 Corte Madera Creek Historical Peak Annual Discharge 3.9-16
Figure 3.9-3. Floodway and Tsunami Inundation Zones 3.9-18
Figure 3.9-4 Project Changes in Velocity from Future Conditions, 10-Year Flood Event 3.9-45
Figure 3.9-5 Project Changes in Velocity from Future Conditions, 25-Year Flood Event 3.9-46
Figure 3.9-6 Project Changes in Velocity from Future Conditions, 100-Year Event 3.9-47
Figure 3.9-7 Project Changes in Water Surface Elevation from Future Conditions, 10-Year Flood Event 3.9-57
Figure 3.9-8 Project Changes in Water Surface Elevation from Future Conditions, 25-Year Flood Event 3.9-58
Figure 3.9-9 Project Changes in Water Surface Elevation from Future Conditions, 100-Year Flood Event 3.9-59
Figure 3.9-10 Reduction in Water Surface Elevation by Parcel, Existing Condition 25-Year Flood Event 3.9-65
Figure 3.10-1 Typical Noise Levels 3.10-3
Figure 3.10-2 Point Source Spreading with Distance 3.10-5
Figure 3.10-3 Noise Measuring Sites and Sensitive Receptors within 1,000 Feet of the Project Area 3.10-10
Figure 3.12-1 Recreational Facilities 3.12-3
Figure 3.12-2 Parks and Recreational Facilities in the Project Area 3.12-4
Figure 3.13-1 Local Transportation Network 3.13-3
Figure 3.15-1 Utilities and Service Systems in the Project Area (Map 1 of 3) 3.15-3
Figure 3.15-2 Utilities and Service Systems in the Project Area (Map 2 of 3) 3.15-4

Figure 3.15-3 Utilities and Service Systems in the Project Area (Map 3 of 3) 3.15-5
Figure 4.3-1 Cumulative Projects Locations 4-14
Figure 5.3-1 Alternative 1: Reduced Footprint–Avoid Frederick Allen Park 5-20
Figure 5.3-2 Alternative 1 Changes in Velocity from Future Conditions - 10-Year Flood Event 5-27
Figure 5.3-3 Alternative 1 Changes in Velocity from Future Conditions - 25-Year Flood Event 5-28
Figure 5.3-4 Alternative 1 Changes in Velocity from Future Conditions - 100-Year Flood Event 5-29
Figure 5.3-5 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 10-Year Flood Event 5-30
Figure 5.3-6 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 25-Year Flood Event 5-31
Figure 5.3-7 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 100-Year Flood Event 5-32
Figure 5.3-8 Difference in Future Water Surface Elevation Between Alternative 1 and Proposed Project – 100-Year Flood Event 5-33
Figure 5.3-9 Alternative 2 Layout 5-39
Figure 5.3-10 Alternative 2 Visual Representation Looking North from the Tennis Courts at Frederick Allen Park 5-40

List of Appendices

Appendix A Notice of Preparation and Scoping Summary Report

Appendix B Tree Removal Table and Landscaping Planting Plans

Appendix C Air Quality Supporting Information

Appendix D Biolological Resouces Supporting Information

Appendix E Supplemental Water Surface Elevation Change Maps

Appendix F Tribal Consultation Supporting Information

Appendix G Mitigaiton Monitoring and Reporting Program

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Executive Summary

This executive summary is provided in accordance with Section 15123 of CEQA Guidelines. As stated in Section 15123(a) of CEQA Guidelines, "[a] EIR shall contain a brief summary of the proposed actions and its consequences. The language of the summary should be as clear and simple as reasonably practical." Section 15123(b) of CEQA Guidelines states, "[t]he summary shall identify: (1) Each significant effect with proposed mitigation measures and alternatives that would reduce or avoid that effect; (2) Areas of controversy known to the Lead Agency including issues raised by agencies and the public; and (3) Issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects." Accordingly, this summary includes a brief synopsis of the project and project alternatives, environmental impacts and mitigation measures, cumulative effects and mitigation measures, areas of known controversy, and issues to be resolved in the EIR. Table ES-1 presents the summary of potential environmental impacts, their level of significance before mitigation, mitigation measures, and levels of significance with mitigation.

ES.1 Summary of Project

The Marin County Flood Control and Water Conservation District (District) proposes the Corte Madera Creek Flood Risk Management Project, Phase 1 (project). The project objectives include the following:

1. **Flood-Risk Reduction.** Reduce overall flood inundation extent and depth in the Town of Ross and Kentfield areas.
2. **Environmental Benefits.** Improve fish passage, natural creek processes, and fish and riparian habitat adjacent to the creek.
3. **Public Access and Recreational Quality.** Maintain public access along the creek via the multi-use path and enhance the recreational experience and amenities along the creek corridor to meet Town of Ross and Kentfield area community needs.
4. **Operational Reliability.** Improve operational reliability and reduce long-term maintenance costs through improving channel stability and protecting existing utilities.
5. **Regulatory Compliance.** Comply with local, state, and federal environmental laws and regulations.
6. **Fiscally Responsible.** Implement a flood-risk reduction project that can be accomplished with local and reasonably foreseeable grant-funding opportunities.

As described in full in Chapter 2 Project Description, the project would be located within the Town of Ross and unincorporated Kentfield (see Figure ES-1). The larger Corte Madera Creek Flood Control Project was originally authorized under the Flood Control Act of 1944 and reauthorized in 1962. As originally planned, it consisted of six units with a concrete-lined channel extending approximately 6.5 miles from the San Pablo Bay upstream to the Town of Fairfax. It was designed to carry all the flow from a standard project flood (approximately 7,500 cubic feet per second [cfs] or a 0.4 percent annual exceedance probability event). Flood control improvements were completed in Units 1, 2, and 3 in 1968, 1969, and 1971, respectively. The Unit 1 and Unit 2 improvements consisted of an earthen trapezoidal channel, extending 3 miles from Kentfield to the San Pablo Bay. The upper 1,700 feet of Unit 2 was designed and constructed as a rectangular concrete-lined channel. Unit 3 extended the concrete-lined channel an additional 3,500 feet upstream, terminating 600 feet downstream of Lagunitas Road Bridge at the Denil fish ladder in the Town of Ross. Unit 4 was never constructed. The project would make improvements Units 2, 3, and 4 of the Corte Madera Creek channel. The project starts upstream of Lagunitas Road in the Town of Ross and ends downstream at the earthen channel in Kentfield. The District would implement this project to reduce flood risk by (i) increasing creek capacity to allow a greater volume of water to flow in channel; (ii) constructing or modifying flood protection elements, such as floodwalls and a stormwater pump station; and, (iii) enhancing creek habitat by removing portions of the concrete channel to create tidal, wetland, and riparian habitats and installing larger functional fish resting pools within the concrete channel. The proposed project elements are shown on Figure ES-2 through Figure ES-4.

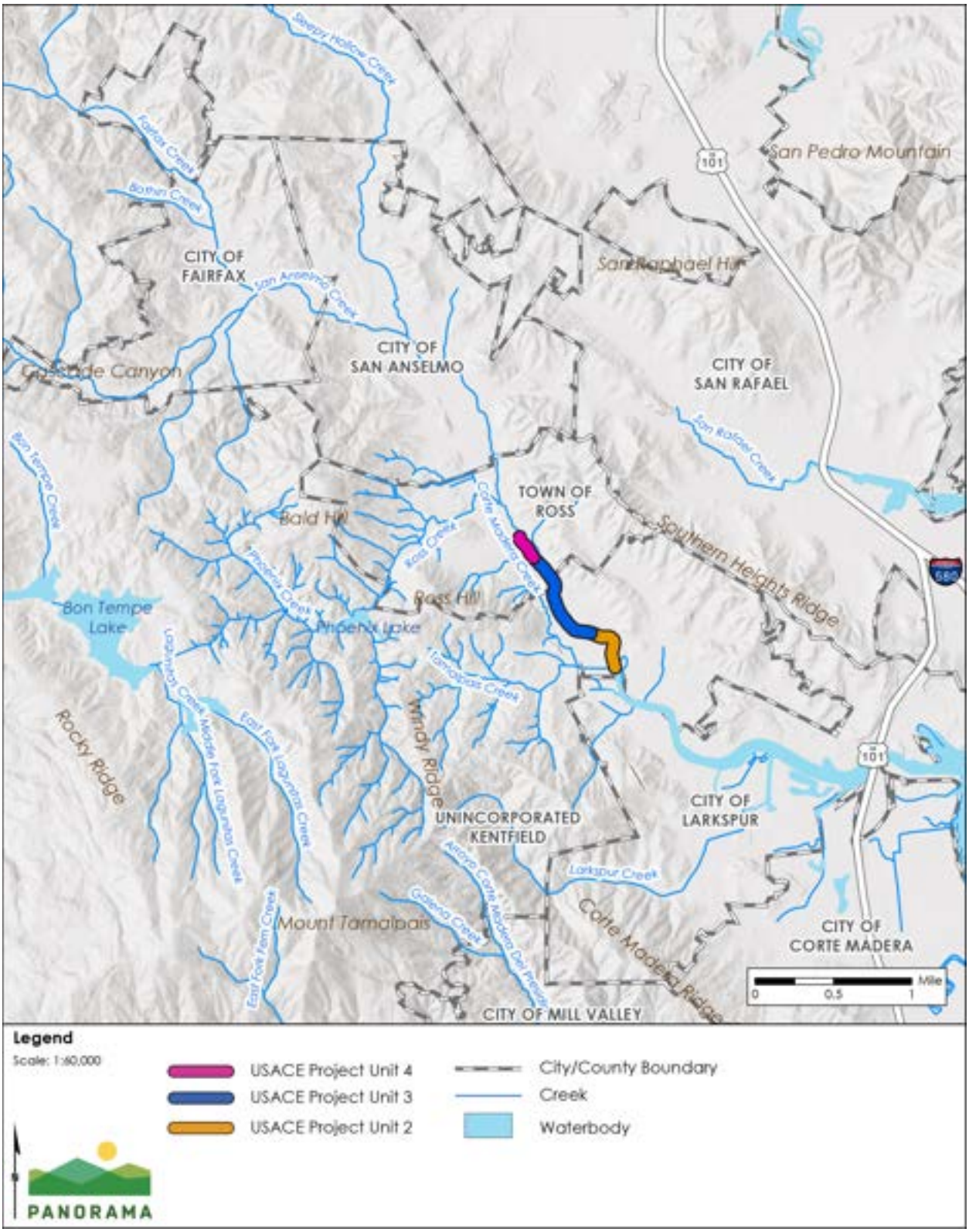
ES.2 Summary of Impacts and Mitigation Measures

Chapter 3 Environmental Setting, Impacts, and Mitigation Measures, describes in detail the environmental impacts that would result from implementation of the project. Impacts of the project may be classified as either:

1. **No impact**. No adverse effects would occur as a result of project implementation
2. **Less than significant**. Adverse effects would occur that are not substantial according to CEQA
3. **Less than significant with mitigation**. Significant or potentially significant adverse effects would occur, but feasible mitigation measures have been identified to reduce those impacts to less-than-significant level
4. **Significant and unavoidable**. Substantial or potentially substantial adverse changes in the environment would occur and the impacts cannot feasibly be reduced with mitigation measures to a less-than-significant level.

Table ES-1, at the end of this chapter, summarizes the project's environmental impacts (including cumulative impacts), the level of significance before mitigation, mitigation measures, and the level of significance after mitigation.

Figure ES-1 Project Location



Sources: (Tele Atlas North America, Inc., 2019; GHD, 2020h; USGS, 2019; U.S. Geological Survey, 2013)

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Figure ES-2 Project Elements (Map 1 of 3)

Source: (GHD, 2020a) (Stetson Engineers, Inc., 2020) (geomorphDESIGN, 2020a) (Tele Atlas North America, Inc., 2019) (Golden Gate National Parks Conservancy, 2018)

Figure ES-3 Project Elements (Map 2 of 3)

Source: (GHD, 2020a) (Stetson Engineers, Inc., 2020) (Tele Atlas North America, Inc., 2019) (Golden Gate National Parks Conservancy, 2018)

Figure ES-4 Project Elements (Map 3 of 3)

Source: (GHD, 2020a) (geomorphDESIGN, 2020b) (Stetson Engineers, Inc., 2020) (Tele Atlas North America, Inc., 2020) (Golden Gate National Parks Conservancy, 2018)

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ES.3 Summary of Significant and Unavoidable, Growth-Inducing, and Cumulative Impacts

This section summarizes the significant and unavoidable adverse impacts, growth-inducing impacts, and cumulative impacts of the project.

ES.3.1 Significant and Unavoidable Impacts

Section 15126.2(b) of CEQA Guidelines requires that an EIR describe the significant impacts of a proposed project, including those that cannot be fully mitigated. This EIR finds that following significant and unavoidable impact would occur if they project were to be implemented.

Aesthetics and Visual Resources

Impact 3.1-2: Removal of the established trees in Frederick Allen Park would change the visual quality of the park. While the project includes landscaping of the park and tree planting within the park, the trees and vegetation that would be planted within the park would not have the same density and canopy as the existing well-established trees for a period of approximately 10 years after tree planting because it would take time for the trees and vegetation to grow and reestablish the dense tree canopy within the park. Views within Frederick Allen Park would change as a result of the tree removal and landscaping because the existing trees and vegetation along the fence visually screen the surrounding commercial buildings on the right bank and views of the concrete channel and residential areas on the left bank. Immediately following planting, the proposed concrete retaining wall, surrounding buildings and earthen channel would become more exposed, which would result in a substantial change in visual quality due to the increased exposure of concrete structures within the park setting. The District would implement Mitigation Measure ~~3.1-2~~ 3.1-3: Large Tree Planting, which requires integrating large box trees into the planting plan and design for Frederick Allen Park. While planting larger trees in the park would minimize impacts to visual quality immediately following construction, the large box trees would not be the same size and would not provide the same visual screening and cover as the fully grown trees that would be removed. The mitigation measure would not fully compensate for the trees being removed in the park. The impact to visual quality would remain significant and unavoidable. Impacts would become less than significant after approximately 10 years, when the landscaping matures and provides cover and visual screening for the park.

ES.3.2 Growth-Inducing Impacts

Chapter 4 Growth-Inducing and Cumulative Effects, discusses the growth-inducement potential of the project. It explains that the project would not involve any housing construction, road extension, permanent employment opportunities, or any infrastructure improvements that could directly or indirectly induce growth. The project would reduce flood risk in existing developed areas. Consequently, implementation of the project would not affect current and/or projected population growth patterns within Marin County and, therefore, would not have a growth-inducing impact.

ES.3.3 Cumulative Impacts

Chapter 4 Growth-Inducing and Cumulative Effects, of this EIR includes an analysis of cumulative impacts from the project. Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. Cumulative impacts were analyzed based on a list of past, present, and probable future projects producing related or cumulative impacts. These impacts were analyzed for whether they were "cumulatively considerable" (i.e., whether the incremental effects of this individual project are considerable when viewed in connection with the effects of past, current, and probable future projects, including those outside the control of the agency).

The cumulative impact analysis found that the project would not cause a new cumulative impact or make a considerable contribution to an existing cumulative impact. That determination was made in some cases because there is no cumulative impact to which the project could contribute. In other cases, the project's impacts, either on their own or after implementation of project-level mitigation measures, would not make a considerable contribution to a cumulative impact.

ES.4 Summary of Plan and Policy Consistency

This EIR evaluates whether the project would conflict with the Marin Countywide Plan, the Marin County Development Code (Zoning and Subdivision Regulations), or the Town of Ross General Plan in Section 3.16 Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics. That analysis concludes that the project would not conflict with applicable policies and regulations. Appropriate decision makers in the District (the CEQA lead agency), Marin County, and the Town of Ross will review the project and make final determinations about the project's consistency with all applicable plans and policies.

ES.5 Summary of Alternatives to the Project

This EIR examines the following four alternatives to the project. The alternatives are summarized below and are described in detail in Chapter 5 Alternatives.

ES.5.1 No Project Alternative

Inclusion and evaluation of the No Project Alternative in an EIR is required by CEQA. This alternative would avoid the adverse environmental impacts of the project's construction and operation. In the No Project Alternative, there would be no construction actions taken or changes to the existing flood control channel or the District's current operations, maintenance, or management practices. The District would continue to maintain the Corte Madera Creek flood control channel and adjacent multi-use path and the Town of Ross would continue to maintain Frederick Allen Park as they do now. Because none of the flood risk reduction benefits and none of the habitat benefits of the project would occur under the No Project Alternative, the

existing flood risk in the area and the degraded ecological condition, including fish passage barriers, would persist.

ES.5.2 Alternative 1: Reduced Footprint – Avoid Frederick Allen Park

Alternative 1 would avoid construction in Frederick Allen Park, which would reduce the project footprint/area of disturbance. Under Alternative 1, four larger fish pools would be constructed within the existing concrete channel adjacent to Frederick Allen Park, but no other modifications would occur to the concrete channel and no construction would occur in the park. Alternative 1 includes construction of all proposed project elements within Unit 4, lower Unit 3, and Unit 2, including removal of the wooden fish ladder in Unit 4.

Compared to the proposed project, Alternative 1 would reduce short-term impacts on aesthetics, air quality, biological resources, geology and soils, GHG emission, hazardous materials, hydrology and water quality, noise, recreation, transportation and circulation, and utilities. Alternative 1 would avoid the significant and unavoidable impact on visual quality. Alternative 1 would result in less long-term benefits to aesthetics, biological resources, geology and soils, hydrology and water quality, and recreation than the proposed project and provide less long-term GHG emission reduction benefits compared to the proposed project because Alternative 1 would involve less planting and natural stream processes that provide long-term GHG reductions through carbon sequestration. Alternative 1 would meet all feasibility criteria and would meet most project objectives.

ES.5.3 Alternative 2: Boardwalk in Frederick Allen Park

Alternative 2 would maintain the existing elevation for Bike Route 20 in Frederick Allen Park. The current bike path elevation would be maintained by constructing the multi-use path as a boardwalk, slightly elevated above the Frederick Allen Park floodplain area. No new public access to the creek would be included in Alternative 2. Alternative 2 would still include removal of the concrete channel and construction of a riparian floodplain within Frederick Allen Park. Alternative 2 includes construction of all proposed project elements within Unit 4, lower Unit 3, and Unit 2, including removal of the wooden fish ladder in Unit 4.

Compared to the proposed project, Alternative 2 would result in reduced operational impacts and increased long-term benefits on biological resources, hydrology and water quality, hazards, recreation, and transportation and circulation. Compared to the proposed project, Alternative 2 would result in a minor long-term net benefit for GHG emissions. Alternative 2 would meet all feasibility criteria and all project objectives.

ES.5.4 Alternative 3: Reduced Concrete and Increased Natural Materials

Alternative 3 would include constructing the retaining wall in Unit 4 and Frederick Allen Park using materials such as rocks or natural materials rather than concrete, and allowing vegetation plantings within the retaining walls; would replace the concrete transition structure at the connection between Units 3 and 4, with quarter- or half-ton rock instead of concrete; and, would include constructing the additional floodwall segment within lower Unit 2, using material such

as rock or a soil-type barrier instead of concrete. The natural floodwall in Unit 2 would remain on the District's property but would be set back from the existing floodwall.

Compared to the proposed project, Alternative 3 would result in a slight reduction in long-term aesthetic, biological, and hydrology and water quality impacts than the proposed project. However, this alternative could result in slightly increased temporary air quality, GHG emissions, and energy impacts during construction due to increased import of materials. Alternative 3 would result in similar long-term GHG emission impacts as the proposed project. Alternative 3 would meet all feasibility criteria and all project objectives.

ES.6 Significant Irreversible Environmental Changes

Construction activities associated with the project would result in an irretrievable and irreversible commitment of natural resources though direct consumption of fossil fuels and use of materials. However, the energy consumption for construction would not result in substantial depletion of non-renewable energy resources and would not permanently increase reliance on energy resources that are not renewable. Construction activities would not reduce or interrupt existing electrical or natural gas services such that existing supplies would be constrained.

Project operations that would affect irretrievable resources would be limited to operation of the new stormwater pump station. Project maintenance would involve activities similar to maintenance of the existing flood control channel. Maintenance activities would result in irreversible and irretrievable use of energy and material resources from annual testing and emergency use of the stormwater pump station generator, use of electricity to power the stormwater pump station during storms, and use of diesel fuel and oil for maintenance vehicles and equipment. The commitment of non-renewable resources usage would be minor, and therefore, would not be significant.

The use of nonrenewable resources is expected to account for a minimal portion of the region's resources and would not affect the availability of these resources for other needs within the region.

ES.7 Areas of Known Controversy

The District held a web-based public scoping meeting on August 27, 2020, to solicit agency and public input regarding the project design and concept. Oral comments were received at the scoping meeting, and additional written comments were received at and following the meeting.

The topics commented on – and thus the main areas of potential controversy are summarized in Table ES-1.

Table ES-1 Summary of Scoping Comments and Areas of Potential Controversy

Topic	Consideration
Aesthetics and Visual Resources	• Consider aesthetic impacts of tree removal on park setting
Air Quality	• Consider air quality impacts at Frederick Allen Park from tree removal. • Address air quality impacts during construction.
Biological Resources	• Address impacts on sensitive species (including special-status plants, fish, and wildlife) and habitats. • Address impacts on fish and wildlife from the proposed creek access. • Address fish passage and fish pools improvement effects. • Address introduction of invasive species. • Address noise and vibration impacts on fish and birds. • Address impacts from tree removal and provide mitigation. • Discuss revegetation and restoration in the project area. • Provide plans for dewatering and fish rescue.
Cultural and Tribal Cultural Resources	• Obtain approval for the final disposition of archaeological, historical, and paleontological resources recovered on State lands.
Geology and Soils	• Address impacts from sediment erosion and aggradation in the Frederick Allen Park Riparian corridor. • Incorporate geological information from Marin Countywide Plan into the EIR. • Address impacts on the structural integrity of the existing concrete channel from the proposed fish pools.
Greenhous Gas Emissions	• Address impacts from greenhouse gas emissions during construction and operation and consider impacts from disposal of the concrete that will be removed in Unit 2.
Hazards and Hazardous Materials	• Address potential impacts from waste entering the creek from surrounding areas. • Discuss increasing risk to public safety from the floodwalls and retaining walls. • Address public safety risk at Frederick Allen Park and potential for people to come in contact with rapidly moving water.
Hydrology and Water Quality	• Address impacts from sediment erosion and accumulation, including increased risk of erosion from tree removal. • Address impacts from rising tidal influence and sea level rise. • Address impacts on flow, hydraulics, sediment transport, and sedimentation from new fish pools. • Address impacts from induced flooding in Frederick Allen Park. • Address impacts from overland water flow from Bolinas Avenue, Fernhill, Southwood, Norwood, Ames, and Lagunitas Road. • Address impacts on the flow through Frederick Allen Park. • Discuss flood risk on Kent Avenue.

Topic	Consideration
	• Discuss accuracy of modeling and calculations. • Compare the 10-year and the 25-year flood risk reduction benefits under existing conditions and existing with cumulative projects. • Address impacts on water quality.
Noise	• Address noise impacts from the stormwater pump station. • Address noise impacts during construction.
Recreation	• Address impacts on bicycle route and use of the multi-use pathway. • Discuss impacts on informal pedestrian pathways.
Transportation	• Address safety of bicyclists and pedestrians on realigned multi-use pathway. • Address impacts from construction truck trips. • Address impacts on bicycle and pedestrian access. • Address impacts on bike path.
Cumulative	• Address cumulative impacts from reasonably foreseeable future projects in the project vicinity. • Address flooding impacts in Granton Park from the access ramp.
Alternatives	• Consider an alternative that only removes the fish ladder • Consider an alternative with floodwall designs that would provide habitat value and would be appropriate for the seawalls on Corte Madera Creek. • Consider an alternative that does not include the project element in the Town of Ross. • Consider an alternative that requires less concrete removal and uses more natural materials. • Consider an alternative that minimizes the need and height of the floodwalls. • Consider an alternative that would eliminate or reduce potentially adverse impacts from sea level rise. • Consider an alternative for the area between Sir Francis Drake Blvd. and Lagunitas Bridge. • Consider an alternative for drainage under Kent Avenue. • Consider an alternative that would address flooding to residents of Sylvan Lane and Shady Lane.

A Scoping Summary Report containing the Notice of Preparation and scoping comments received are included in Appendix A. The Scoping Summary Report also identified the Draft EIR sections that address the scoping issues raised in the comments received.

ES.8 Major Conclusions and Issues to be Resolved

The following major conclusions and issues to be resolved are derived from the analysis in the EIR. The major conclusions of the EIR are presented first, followed by the issues to be resolved. The issues are presented to highlight the topics on which the decision-makers may want to focus special attention.

ES.8.1 Major EIR Conclusions

The EIR evaluates a total of 56 project-based potential adverse environmental impacts. Of these, 19 are identified as significant impacts. Feasible mitigation measures are available to reduce all but one of the project's significant project-based effects to a less-than-significant level. The one significant and unavoidable impact of the project is the temporary impact on visual quality within Frederick Allen Park. The impact on visual quality would be significant and unavoidable for a period of approximately 10 years while the planted trees grow to a height where the tree canopy screens views of the concrete structures and surrounding buildings to a level that is similar to the existing visual screening of the surrounding area. The EIR also evaluates cumulative impacts of the project in combination with other related past, present, and probable future projects, and identifies one significant cumulative impact. The project's contribution to this impact would not be cumulatively considerable with implementation of mitigation.

The project would result in a substantial net reduction in flooding under existing and cumulative project conditions for the 10-year, 25-year and 100-year storm events within the Town of Ross and Kentfield area. The project would result in some increased flooding within parking areas adjacent to Corte Madera Creek near the College Avenue Bridge; however, the areas of increased flooding do not contain any homes or buildings and the increased flooding would not create a risk to life or property.

ES.8.2 Issues to be Resolved

Draft EIR Section 3.1 Aesthetics and Visual Resources, identified a significant and unavailable visual quality impact in Frederick Allen Park. Implementation of mitigation, which involves planting larger trees would not avoid the significant impact in Frederick Allen Park because the large trees would take approximately 10 years to mature and replace the tree canopy that is currently provided by the trees that would be removed in the park. The impact to visual quality would remain significant and unavoidable during the first 10 years of project operation. Impacts would be less than significant when the landscaping matures and provides shades, cover, and visual screening from the surrounding area.

The District's Board of Supervisors will need to consider whether to adopt a statement of overriding considerations, prior to approving the project, stating the reasons why the benefits of the project outweigh its significant and unavoidable impact as identified in this EIR and/or adopt feature of one or more of the alternatives that would further reduce this impact.

ES.8.3 Effects Found Not to be Significant

The impact analysis determined that in 10 of the 20 resource areas, impacts would be either less than significant or have no impact, generally due to the project's required compliance with applicable regulations protecting these resources and/or limited extent that the existing resource would be affected by the project. These resource areas are:

- Energy
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials

- Public Services
- Utilities and Service Systems
- Agriculture and Forestry Resources
- Mineral Resources
- Land Use and Planning
- Population and Housing
- Wildfire

The EIR identified significant impacts that could be mitigated to a less-than-significant level with implementation of mitigation measures in the following resource areas:

- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hydrology and Water Quality
- Noise
- Recreation
- Transportation and Circulation
- Tribal Cultural Resources

ES.9 Other Social and Economic Impacts Found not to be Significant

CEQA Guidelines Section 15382 provides that "[a]n economic or social change by itself shall not be considered a significant effect on the environment." However, physical impacts associated with social or economic changes may be considered significant. Pursuant to CEQA Guidelines Section 15382, purely economic or social impacts would not be considered significant impacts of the project. This EIR evaluates all physical impacts that would result from the project and has not identified any physical impacts associated with substantial social or economic changes.

ES.10 Mitigation Monitoring and Reporting Program

In conformance with California Resources Code Section 21081.6, a Mitigation Monitoring and Reporting Program has been prepared for the project, if approved. The purpose of the program would be to ensure compliance with the mitigation measures incorporated into the project and set forth in this EIR. The Mitigation Monitoring and Reporting Program is presented in Appendix G.

Table ES-~~1~~2 Summary of Impacts and Mitigation for the Project

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Aesthetics and Visual Resources			
Impact 3.1-1: The project would not have a substantial adverse effect on a scenic vista.	Less than Significant	None required.	Less than Significant
Impact 3.1-2: The project would not conflict with applicable zoning and other regulations governing scenic quality	Less than Significant	None required.	Less than Significant
Impact 3.1-3: The project would substantially degrade the existing visual character or quality of public views of the site and its surroundings	Potentially Significant	**Mitigation Measure 3.1-3: Large Tree Planting**. The District will integrate ~~large box trees~~ 24-inch or 36-inch box trees into the final planting plan and design for Frederick Allen Park, to the extent ecologically appropriate for the proposed species. The Town of Ross will provide the desired size and species of trees to the District. The final planting plan will be provided to the Town of Ross for review and approval ~~comment~~ no less than 90 days prior to landscaping. The District will be responsible for maintaining replacement trees until they become established and for replacing dead trees for a period of no less than 10 years.	Significant and Unavoidable
Air Quality			
Impact 3.2-1: The project would not conflict with or obstruct implementation of the applicable air quality plan.	Less than Significant	None required.	Less than Significant
Impact 3.2-2: The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	Potentially Significant	**Mitigation Measure 3.2-2: Fugitive Dust Measures.** To limit dust, criteria pollutants, and precursor emissions associated with construction, the following BAAQMD-recommended fugitive dust control measures shall be implemented and included in all contract specifications for components constructed under the project: • All exposed surfaces (e.g., unpaved parking areas, unpaved staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • Construction equipment shall be properly maintained by a certified mechanic. • A publicly visible sign shall be posted with the telephone number and person to contact at the District regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.	Less than Significant
Impact 3.2-3: The project would not expose sensitive receptors to substantial pollutant concentrations.	Potentially Significant	**Mitigation Measure 3.2-3: Engine Controls for Construction Equipment.** All off-road equipment greater than 25 horsepower that operates for more than 20 total hours over the entire duration of construction activities shall have engines that meet the USEPA or CARB Tier 3 off-road and Diesel Particulate Filter level 3 emission standards or more stringent standards for all phases of construction except the Lower College of Marin concrete channel removal.	Less than Significant
Impact 3.2-4: The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	Less than Significant	None required.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Biological Resources			
Impact 3.3-1: The project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	Potentially Significant	**Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities.** Prior to construction, the District shall have a qualified botanist conduct botanical surveys according to CDFW protocols (i.e., Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities [CDFW, 2018 or more current]) during the appropriate time(s) of year (i.e., surveys shall coincide with the phenological stage during which the potential special-status plant species are identifiable in the field—for example, in April and again in July) to determine if any potential special-status plant species or sensitive natural communities are located within or immediately adjacent to the project area. If construction is planned to begin prior to the completion of comprehensive botanical surveys (e.g., construction is planned for April 2022, but plant surveys are planned for April and July), then the District shall conduct comprehensive plant surveys the year prior to construction (e.g., in 2021). If no special-status plants or sensitive natural communities are observed during appropriately timed surveys by a qualified botanist, it is assumed the construction activity will have no impact on special-status plants or sensitive natural communities and no further action is required. Immediately preceding construction, the District shall flag or otherwise mark (e.g., stake, fence) areas with special-status plants or sensitive natural communities within the project area for avoidance, including a 10-foot radius buffer. The District also shall identify locations for equipment and personnel-access and materials staging that will minimize disturbance in riparian habitat and coastal brackish marsh. When heavy equipment is required, unintentional soil compaction shall be minimized by using equipment with a greater reach or using low-pressure equipment. A biological monitor shall be present during construction within a 10-foot buffer of special-status plants to ensure impacts are avoided. If avoidance of any special-status plant is not possible, prior to construction the District shall coordinate with CDFW and/or USFWS to establish procedures for compensatory mitigation. These measures may include collection of seeds when mature (generally the beginning of plant senescence) and salvage and transplant of any special-status plants that would otherwise be impacted by construction activities. Mitigation ratios, location, and timing of transplants shall be determined in consultation with CDFW and/or USFWS, and the mitigation ratio will be at a minimum of 1:1. The District shall monitor the success of transplant establishment for a period of at least three years, or as otherwise required by CDFW and/or USFWS. Location of transplanted individuals shall be recorded using a submeter-accuracy global positioning system (GPS) to enable location of the special-status plant species during and after the monitoring period is complete. **Mitigation Measure 3.3-1b: Fish Capture and Relocation.** If in-channel work requires dewatering, including for sediment-removal maintenance activities, fish shall be captured and relocated upstream of the project areas to avoid injury and mortality and minimize disturbance. The District shall implement the measures below and described in the fish rescue plans in Appendix D, or whatever more stringent species-preservation and avoidance measures are imposed by resource agencies, including NMFS and CDFW, with jurisdiction over aquatic special-status species. 1. The name(s) and credentials of qualified biologist(s) to act as construction monitors shall be submitted to CDFW and NMFS for approval at least 15 days before construction work begins. 2. Prior to and during the initiation of construction activities, a qualified fisheries biologist (i.e., approved by CDFW and/or NMFS) shall be present during installation and removal of creek-diversion structures. 3. For sites that require flow diversion and exclusion, the work area shall be blocked by placing fine-meshed nets or screens above and below the work area to prevent salmonids from re-entering the work area. To minimize the potential for re-entry, mesh diameter shall not exceed 1/8 inch. The bottom edge of the net or screen shall be secured to the channel bed to prevent fish from passing under the screen. Exclusion screening shall be placed in low-velocity areas to minimize fish impingement against the mesh. Screens shall be checked periodically and cleaned of debris to permit free flow of water. 4. Before removal and relocation on individual fish begins, a qualified fisheries biologist shall identify the most appropriate release location(s). In general, release locations should have water temperatures similar to (<3.6 degrees Fahrenheit difference) the capture location and offer ample habitat (e.g., depth, velocity, cover, connectivity) for	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation

released fish and should be selected to minimize the likelihood of reentering the work area or becoming impinged on exclusion nets or screens.

5. The means of capture shall depend on the nature of the work site and shall be selected by a qualified fisheries biologist as authorized by CDFW and NMFS. Complex stream habitat may require the use of electrofishing equipment, whereas in outlet pools, fish and other aquatic species may be captured by pumping down the pool and then seining or dip netting. Electrofishing, if necessary, shall be conducted only by properly trained personnel holding current permits from CDFW and NMFS and following the most recent NMFS electrofishing guidelines (NMFS, 2000).
6. Initial fish relocation efforts shall be performed several days prior to the scheduled start of construction and continue through cofferdam installation and work-area dewatering activities.
7. Flow diversions and species relocation shall be performed during morning periods. The fisheries biologist shall survey the exclusion screening throughout the diversion effort to verify that no special-status fish, amphibians, or aquatic invertebrates are present. Handling of fish shall be minimized. When handling is necessary, personnel shall wet hands or nets before touching them.
8. Prior to translocation, fish that are collected during surveys shall be temporarily held in cool, aerated, shaded water using a five-gallon container with a lid. Overcrowding in containers shall be avoided; at least two containers shall be used, and no more than 25 fish shall be kept in each bucket. Aeration shall be provided with a battery-powered external bubbler. Fish shall be protected from jostling and noise and shall not be removed from the container until the time of release. A thermometer shall be placed in each holding container, and cold blocks or partial water changes shall be conducted as necessary to maintain a stable water temperature. Special-status fish shall not be held more than 30 minutes.
9. If fish are abundant, capture shall cease periodically to allow release and minimize the time fish spend in holding containers.
10. Fish shall not be anesthetized or measured. However, they shall be visually identified to species level, and year classes shall be estimated and recorded.
11. Reports on fish-relocation activities shall be submitted to CDFW and NMFS in within two weeks following completion of in-channel operations.

Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection. All construction personnel shall attend an environmental education program delivered by a qualified biologist prior to working in the project area. The training shall include an explanation as how to best avoid the accidental take of special-status species, including salmonids and other fish species, amphibians, reptiles, birds, and rare plants.

The training session shall be mandatory for contractors and all construction personnel. The field meeting shall include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis shall be placed on the importance of the habitat and life-stage requirements within the context of maps showing areas where minimization and avoidance measures are being implemented. The program shall include an explanation of appropriate federal and state laws protecting endangered species and all mitigation measures that will be implemented to avoid significant impacts on special-status species. Each person will receive a training handout for their use and reference.

The contractor shall provide closed garbage containers for the disposal of all trash items (e.g., wrappers, cans, bottles, food scraps). Work sites shall be cleaned of litter before closure each day and litter placed in wildlife-proof garbage receptacles. Construction personnel shall not feed or otherwise attract any wildlife. No pets, excluding service animals, shall be allowed in construction areas.

Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds. If tree removal occurs outside of the nesting season, no surveys or monitoring would be needed. If tree removal or construction occurs in the nesting season (February 1 to August 31). If tree removal or construction occurs in the nesting season (February 1 to August 31), a qualified biologist shall conduct a white-tailed kite and general nesting bird survey within the project area and areas within a 500-foot buffer from project construction. If active nests are identified, a no-disturbance buffer zone will be established around the nest as appropriate and in consideration of line-of-sight for the bird as well as existing human presence/activities

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation

around the nest when it was established; recommended buffers are 500 feet for white-tailed kite and non-listed raptors, and 25 feet to 250 feet for other non-listed birds as recommended by a biologist who is qualified to assess avian breeding behavior. Smaller buffers may be appropriate in the project area given the limited line of site due to existing development and anthropogenic disturbance in the area (e.g., traffic on Sir Francis Drake and adjoining areas). Construction work may continue outside of the no-work buffer.

Mitigation Measure 3.3-1e: Invasive Plant Species Control. All vehicles and equipment entering the project shall be washed to remove dirt, pathogens, invasive plant seeds, or invasive plant parts prior to entry on the project site. Particular attention shall be shown to the undercarriage and any surface where soil containing invasive plant seeds may exist. The District shall dispose of the waste material in an appropriate disposal facility. Arrangements shall be made for inspection of each piece of equipment before entering the project construction areas to ensure all equipment has been properly washed. The District shall follow these additional measures:

- Any permanent or temporary erosion control measures implemented to minimize erosion during and after construction shall be certified weed-free.
- Nursery operations that supply revegetation or seeding plant material must certify implementation of best management practices to reduce pest and pathogen contamination within their nursery, including of Phytophthora pathogens, the pathogen responsible for Sudden Oak Death (SOD).
- All tree removal and trimming activities shall include measures to avoid the spread of SOD (Phytophthora) pathogens. This may include, but is not limited to the following:
  - As a precaution against spreading the pathogen, pruning tools shall be cleaned and disinfected after use on confirmed or suspected infested trees or in known infested areas. Tools shall be sanitized before pruning healthy trees or working in pathogen-free areas. Chippers and other vehicles of mud, dirt, leaves, organic material, and woody debris shall be cleaned before leaving a site known to have SOD and before entering a site with susceptible hosts.
  - Crews shall be informed about the arboricultural implications of SOD and sanitation practices when they are working in infested areas.
  - Sanitation kits containing chlorine bleach, scrub brush, metal scraper, boot brush, and plastic gloves shall be provided to crews.
  - Shoes, pruning gear, and other equipment shall be sanitized before working in an area with susceptible species.
  - When possible, the District shall conduct work on SOD-infected and susceptible species during the dry season (June through October). When working in wet conditions, equipment shall be kept on paved, graveled, or dry surfaces and mud avoided. The District shall work in disease-free areas before proceeding to any infested areas.
  - If possible, soil or plant material (wood, brush, leaves, and litter) from host trees in any infested areas shall not be collected. Rather, material (e.g., wood, bark, brush, chips, leaves, or firewood) from tree removals or pruning of symptomatic or non-symptomatic host plants shall remain on site to minimize pathogen spread.
  - All reasonable methods to sanitize personal gear and crew equipment shall be used before leaving an SOD infested site. Accumulated soil and mud shall be scraped, brushed, and/or hosed off from clothing, gloves, boots, and shoes. Mud and plant debris shall be removed by blowing out or power washing chipper trucks, chippers, bucket trucks, fertilization and soil aeration equipment, cranes, and other vehicles. Movement of soil and leaf litter shall be restricted under and around infected trees as spores may be found there.
  - Tools used in tree removal/pruning may become contaminated and shall be disinfected with alcohol or chlorine bleach.

Mitigation Measure 3.3-1f: Intertidal Upstream of Stadium Way Cofferdam. Prior to completing construction of the cofferdam near Stadium Way for the Unit 2 dewatering, an inspection of the reach upstream will be conducted to determine if tidal water is present at low tide. A fish removal/herding effort will be initiated if tidal water is present. The fish removal/herding effort will consist of a beach seine sweep beginning at the upstream end of tidal water and proceeding in a downstream direction to the Stadium Way cofferdam site. The impoundment structure could be completed once the sweeping action is downstream of the cofferdam. This action would ensure that estuarine fish would

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		not be stranded in standing water upstream of the Stadium Way cofferdam and be subject to injury or mortality during the approximately eight weeks this reach would be cut off from tidal flux. **Mitigation Measure 3.3-1g: Avoid Salt Marsh Harvest Mouse.** Prior to initiation of project work in potential salt marsh harvest mouse habitat, the areas and pathways to be affected will be flagged by construction personnel and verified by a Qualified Biological Monitor (including work areas, staging areas, and access roads/paths to these work and staging areas). The flagged areas(s) will include a two-foot perimeter buffer. All wetland vegetation and other vegetation within 50 feet of wetland vegetation requiring removal will be removed under the supervision of the USFWS- and CDFW-approved Qualified Biological Monitor. This vegetation will be salvaged and maintained on site and will be replanted upon completion of construction activities. Vegetation removal shall start at the edge farthest from the salt marsh or the poorest habitat and work its way towards the salt marsh or the better salt marsh habitat. If a mouse of any species is observed within the areas being removed of vegetation, work shall be halted and the USFWS and CDFW shall be notified. To prevent salt marsh harvest mice from moving through the project site during construction, temporary exclusion fencing will be placed around defined work area(s) identified by the Qualified Biological Monitor prior to the start of construction activities. The fencing will be installed immediately after vegetation removal, with the two-foot buffer (cleared of vegetation) remaining between fencing and existing vegetation. The fence will consist of silt fencing (or similar material) and will be buried to a minimum depth of two inches so that mice cannot crawl under the fence. Fence height will be at least one foot higher than the highest adjacent vegetation, with a minimum height of two feet. All supports for the exclusion fencing will be placed on the inside of the work area. The fencing will be immediately removed upon project completion. Prior to the start of daily construction activities, the Qualified Biological Monitor will inspect the exclusion fencing to ensure that it is functional (e.g., has no rips or tears and remains buried in the ground). The fenced area(s) will also be inspected to ensure that no mice are trapped there. Any mice suspected to be salt marsh harvest mice that are found along and outside the fence will be closely monitored until they move away from the construction area. To prevent potential entrapment of salt marsh harvest mice in work equipment, pipes or similar objects located in salt marsh harvest mouse habitat will be capped prior to the end of the workday and then inspected by the biological monitor prior to commencement of work activities the following day. Work in or immediately adjacent to vegetated marsh areas, as identified by the Qualified Biological Monitor, will be scheduled to avoid extreme high tides because protective cover for mice is limited at this time. Specifically, no work will occur two hours before or after extreme high tides as directed by the Qualified Biological Monitor for 6.0 feet National Geodetic Vertical Datum (NGVD) or above, as measured at the Golden Gate Bridge, or adjusted to the timing of local extreme high-tide events in which the marsh plain is flooded.	
Impact 3.3-2: The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	Potentially Significant	**Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities (see above)** **Mitigation Measure 3.3-1e: Invasive Plant Species Control (see above)** **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan.** The District shall prepare a Habitat Restoration and Monitoring Plan for revegetation prior to construction activities as detailed herein. The plan shall describe any required salvage and replanting protocols prior to and after construction is complete. The plan shall include, but not be limited to, protocols for replanting of vegetation removed prior to or during construction and management and monitoring of the plants to ensure replanting success pursuant to the most stringent requirements included in permits issued for the project. At a minimum, impacted trees greater than or equal to six inches diameter at breast height (dbh) shall be mitigated at a minimum of 1:1 replacement for nonnative tree species and 3:1 replacement for native tree species. Monitoring and any necessary maintenance of revegetated areas shall occur for a minimum of ten years. The plan shall specify monitoring and performance criteria for the species planted and invasive species control criteria as well as the best time of year for planting and seeding to occur, pursuant to requirements of permits from the various resource agencies with regulatory purview over the project. At a minimum, replanted woody trees and shrubs shall have a minimum of 85% survival after five years of monitoring to track progress toward performance criteria. Additional	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		monitoring shall be conducted if the revegetated areas do not meet the performance criteria in year five; any replacement plants shall be monitored with the same survival criteria for five years after planting. Areas impacted by construction-related activity shall be replanted or reseeded with native trees, shrubs, and herbaceous perennials and annuals from the watershed under guidance from a qualified biologist. Local plant materials shall be used for revegetation of the disturbed area. The plant materials shall include local cuttings from the local watershed or from adjacent watersheds. Seeds shall be collected during the appropriate season, and the container plants shall be of an appropriate size for out-planting. The Habitat Restoration and Monitoring Plan shall also address restoration of jurisdictional wetlands and waters. Temporary impacts to wetlands shall be restored on site with native wetland species under guidance from a qualified biologist. Permanent impacts to jurisdictional wetlands shall be mitigated for by replacement on or off site at a minimum 1:1 ratio or whatever more stringent requirements are included in the permits to be issued for the project. The monitoring plan shall include annual monitoring of restored areas for at least five years. The plan shall contain vegetation management protocols, protocols for monitoring replanting success, and an adaptive management plan if success criteria are not being met. The adaptive management plan would include interim thresholds for replanting success and alternative management approaches, such as weed control, supplemental watering, or additional replanting to undertake if thresholds are not met. **Mitigation Measure 3.3-2b: Tree Mitigation.** To mitigate for removal of any native trees in the project area or any trees greater than or equal to 6 inches located within the riparian corridor, the District shall replant trees on site, to the extent possible. The District will identify other suitable locations within the watershed if the project area is not large enough to support the replacement of all trees required for mitigation. If suitable mitigation sites are not located within the watershed, then additional sites will be identified within the County or beyond. All mitigation sites shall be coordinated with and approved by resource agencies. The District may contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code to the extent allowed by CDFW. Mitigation ratios shall be developed in coordination with the relevant resource agencies (i.e., CDFW and RWQCB) and the Town of Ross and shall vary according to both the type of tree impacted (i.e., tree species, whether or not the impacted tree is native to California or nonnative, and tree size) and the location of the mitigation planting (i.e., trees planted outside of the watershed may be subject to higher mitigation ratios). Impact mitigation ratios shall be a minimum of 1:1 for nonnative tree species to 3:1 for most native tree species or on a trunk-diameter basis per the Town of Ross Municipal code (i.e., 1:1 trunk diameter for trees in good or excellent condition [e.g., one 21-inch tree removed in good condition shall be replaced by new trees totaling 21-inch trunk diameter], 3:1 trunk diameter for trees in fair or marginal condition [e.g., one 21-inch tree removed in fair condition shall be replaced by new trees totaling 7-inch trunk diameter], and trees in poor condition shall be replaced with tree[s] totaling two inches in truck diameter), whichever is greater. Impact mitigation ratios for oak trees are expected to range from 4:1 (for impacted oak trees that are 5 to 10 inches dbh) to 5:1 (for impacted oak trees that are 10 to 15 inches dbh) and 15:1 (for impacted oak trees greater than 15 inches dbh). The District shall prepare a detailed Tree Mitigation Plan and obtain approval from CDFW for the Tree Mitigation Plan. Replacement oaks shall come from nursery stock grown from locally sourced acorns or from acorns gathered locally, preferably from the same watershed in which they are planted. The trees should be able to survive the last two years of the minimum five-year monitoring period without supplemental irrigation. If at any time the District identifies additional trees that need to be removed, the District shall first get written approval from CDFW, RWQCB, and the Town of Ross and the District shall revise the final plan to include additional tree plantings in accordance with agency-approved mitigation ratios. Based on final total of trees impacted by the project, the plan shall include the details of the number and species of trees to be planted, specific planting locations, maintenance and irrigation needs, monitoring requirements (i.e., five years monitoring plant vigor and growth), reporting requirements, and success criteria to be met before monitoring is concluded (e.g., survival rates, assessment of "good" overall tree vigor, and tree viability without irrigation). The plan shall be submitted to resource agencies for review and approval prior to implementation.	
Impact 3.3-3: The project would not have a substantial adverse effect on state or federally protected wetlands	Potentially Significant	**Mitigation Measure 3.3-1e: Invasive Plant Species Control (see above)**	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
(including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.			
Impact 3.3-4: The project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	Potentially Significant	**Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds and Mitigation Measure 3.3-2b: Tree Mitigation (see above)**	Less than Significant
Impact 3.3-5: The project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Less than Significant	None required.	Less than Significant
Impact 3.3-6: The project would not introduce a new non-native or invasive species of plant or animal into an area.	Potentially Significant	**Mitigation Measure 3.3-6: Invasive Aquatic Species Control.** All heavy equipment that has operated in waters outside of the Corte Madera Creek watershed shall be steam-cleaned and inspected prior to entering the project area. Any in-channel equipment that could be used in other water bodies will be decontaminated following the completion of the project. In addition, all waders, wading boots, block nets, dip nets, and buckets used within Corte Madera Creek will undergo decontamination. Decontamination protocols will include: • Freeze equipment/gear for a minimum of 8 hours at temperatures at 26°F (-3°C) or below. • Soak equipment/gear in a bath of hot water (at least 120°F, 46°C) for 10 minutes. • Soak equipment/gear in a bath of a disinfectant containing quaternary ammonium compounds (QAC) (e.g., Quat 4, Quat 128, Super HDQ Neutral, etc.) for 10 minutes. The QAC-containing disinfectant should be diluted with water at a rate to achieve a minimum active QAC concentration of 0.4%. Six (6) ounces of disinfectant to gallon of water can be used as a disinfectant to water ratio (1:21). After removal from the bath, rinse equipment/gear thoroughly with tap water.	Less than Significant
Cultural Resources			
Impact 3.4-1: The project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.	No Impact	None required.	No Impact
Impact 3.4-2: The project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	Potentially Significant	**Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources**. If evidence of any subsurface archaeological features or deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find, and the finds shall be protected until they are examined by a qualified archaeologist. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone-milling equipment (e.g., mortars, pestles, handstones, milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls and deposits of metal, glass, and/or ceramic refuse. The District shall retain a qualified archaeologist who meets the U.S. Secretary of the Interiors professional qualifications in archaeology to assess the significance of the find and make recommendations for further evaluation and treatment as necessary. A Native American representative from a traditionally and culturally affiliated tribe will be notified and invited to assess the find if the artifacts are of Native American ancestry and determined to be more than an isolated find. If the discovery is in an area below Stadium Way and on lands under the jurisdiction of California State Lands Commission, that agency shall be notified. Any treatments and disposition of any artifacts uncovered under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission before the treatment is implemented.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		If, after evaluation, a resource is considered a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in PRC Section 21074), all preservation options shall be considered as required by CEQA (see CEQA Guidelines Section 15126.4 and PRC 21084.3), including possible capping, data recovery, mapping, or avoidance of the resource. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil. Work in the area may resume, at the direction of the District, upon completion of treatment. An Unanticipated Discoveries Evaluation and Treatment Plan shall be prepared before construction that details the procedures for dealing with unanticipated discoveries, including procedures that would be implemented for such discoveries that cannot be protected in place. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.	
Impact 3.4-3: The project could disturb any human remains, including those interred outside of formal cemeteries.	Less than Significant	None required.	Less than Significant
Energy			
Impact 3.5-1: The project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.	Less than Significant	None required.	Less than Significant
Impact 3.5-2: The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	Less than Significant	None required.	Less than Significant
Geology and Soils			
Impact 3.6-1: The project could directly or indirectly cause potential substantial adverse effects, including the risk or loss, injury, or death involving: i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42. ii. Strong seismic ground shaking. iii. Seismic-related ground failure, including liquefaction. iv. Landslides.	Potentially Significant	**Mitigation Measure 3.6-1: Geotechnical Investigation Report** The District shall have a professional geotechnical engineer conduct a geotechnical investigation to evaluate the potential for geotechnical hazards to occur on-site in accordance with the recommendations of the California Geological Survey. The Geotechnical Investigation Report shall provide site-specific recommendations for structures (e.g., floodwalls, fish pools, and stormwater pump station), work areas, and access routes where there is an elevated risk of geologic hazards. The Geotechnical Investigation Report shall be incorporated into the final project design of the retaining walls and floodwalls. The Geotechnical Investigation Report shall specify exact design coefficients that are needed by structural engineers to determine the type and sizing of structural materials. The Geotechnical Investigation Report shall be subject to performance criteria imposed by the California Building Code, as applicable. The Geotechnical Investigation Report shall be prepared by a registered civil engineer or certified engineering geologist and include appropriate measures to minimize seismic hazards and ensure structural safety of the proposed structures.	Less than Significant
Impact 3.6-2: The project would not result in substantial soil erosion or the loss of topsoil.	Less than Significant	None required.	Less than Significant
Impact 3.6-3: The project would be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and	Less than Significant	None required.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.			
Impact 3.6-4: The project would not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.	Less than Significant	None required.	Less than Significant
Impact 3.6-5: The project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	Less than Significant	None required.	Less than Significant
Greenhouse Gas Emissions			
Impact 3.7-1: The project would generate greenhouse gas emissions that would have a less-than significant impact on the environment.	Less than Significant	None required.	Less than Significant
Impact 3.7-2: The project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Less than Significant	None required.	Less than Significant
Impact 3.7-3: The project would not significantly alter air movement, moisture, or temperature, or cause any change in climate.	Less than Significant	None required.	Less than Significant
Hazards and Hazardous Materials			
Impact 3.8-1: The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment, including, but not limited to oils, pesticides, chemicals, or radiation.	Less than Significant	None required.	Less than Significant
Impact 3.8-2: The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	Less than Significant	None required.	Less than Significant
Impact 3.8-3: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than Significant	None required.	Less than Significant
Impact 3.8-4: The project would not create any health hazard or potential health hazard, expose people to existing sources of potential health hazards, or result in unsafe conditions for employees, visitors, or students.	Less than Significant	None required.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Hydrology and Water Quality	
Impact 3.9-1: The project could violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality; or result in discharge of pollutants into surface or ground waters or other alteration of surface or ground water quality (e.g., temperature, dissolved oxygen or turbidity).	Potentially Significant	**Mitigation Measure 3.9-1: Conduct Soil/Sediment Testing.** Excavated and exposed soil and sediment at risk of erosion or mobilization will be tested for contaminants of potential concern (COPCs) for concentrations above SFBRWQCB's Environmental Screening Levels (ESLs) for shallow soils, where groundwater is not a drinking water source, for commercial land use. Additional sampling results shall be compared to the Total Threshold Limit Concentrations (TTLCs) specified in California Code of Regulations (CCR) Title 22 Chapter 11 for hazardous waste identification. Soils will be tested prior to initiation of excavation activities to determine appropriate treatment, storage, and suitability for on-site onsite reuse, landfill disposal, or hazardous waste disposal.	Less than Significant
Impact 3.9-2: The project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i. result in substantial erosion or siltation on- or off-site; ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv. impede or redirect flood flows.	Less than Significant	None required.	Less than Significant
Impact 3.9-3: The project would not risk release of pollutants as a result of project inundation due to tsunami	Less than Significant	None required.	Less than Significant
Impact 3.9-4: The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Less than Significant	None required.	Less than Significant
Impact 3.9-5: The project would not expose people or property to flooding hazards	Less than Significant	None required.	Less than Significant
		Noise	
Impact 3.10-1: The project could result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	Potentially Significant	**Mitigation Measure 3.10-1: Construction Noise Reduction Plan**. The District would adhere to this requirement and develop a construction noise reduction plan in compliance with local regulations to include measures to reduce construction noise impacts. These measures shall include, but not be limited to, the following: 1. Distribute to the potentially affected residences and other sensitive receptors within 200 feet of project construction boundary a "hotline" telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise-disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		complaints shall be logged noting date, time, complainant's name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project area of the construction schedule. 2. All construction equipment shall have intake and exhaust mufflers recommended by the manufacturers thereof. Further, pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof. In lieu of or in the absence of manufacturers' recommendations, the Director of Public Works shall have the authority to prescribe such means of accomplishing maximum noise attenuation as he deems to be in the public interest, considering the available technology and economic feasibility. 3. Maintain maximum physical separation between noise sources (construction equipment) and sensitive noise receptors. Separation may be achieved by locating stationary equipment to minimize noise impacts on the community. 4. Impact tools (e.g., jack hammers) used during construction activities will be hydraulically or electrically powered where feasible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. 5. Use construction noise barriers such as paneled noise shields, barriers, or enclosures adjacent to noisy stationary equipment such as generators, air compressors, jackhammers, etc. Noise control shields shall be made featuring a solid panel and a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.	
Impact 3.10-2: The project would not result in generation of excessive groundborne vibration or groundborne noise levels.	Potentially Significant	**Mitigation Measure 3.10-2: Vibration Reduction Measures.** The District shall design the project to avoid intense vibration activities within five feet of the structures at Frederick Allen Park (e.g., avoid use of large bulldozer, jackhammer, hoe ram, or loaded trucks). If intense vibration generating activities cannot be avoided in proximity to structures, vibration monitoring shall be conducted during grading and floodwall construction activities in Frederick Allen Park to confirm vibration levels do not exceed vibration thresholds at the nearest receptors. If vibration levels approach the threshold of 0.3 PPV at the nearest structure, then construction practices shall be modified (i.e., use smaller types of construction equipment, operate the equipment in a manner to reduce vibration, or use alternate construction methods) so that the threshold is not exceeded.	Less than Significant
Public Services			
Impact 3.11-1: The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of thepublic services. i. Fire protection ii. Police protection iii. Schools iv. Parks v. Other public facilities	Less than Significant	None required.	Less than Significant
Impact 3.11-2: The project would not result in maintenance of public facilities, including roads.	Less than Significant	None required.	Less than Significant
Recreation			
Impact 3.12-1: The project would not increase the use of existing neighborhood and regional parks or other	Less than Significant	None required.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.			
Impact 3.12-2: The project would include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment.	Less than Significant	None required.	Less than Significant
Impact 3.12-3: The project could affect existing recreational opportunities.	Potentially Significant	**Mitigation Measure ~~3.1-2~~ 3.1-3: Large Tree Planting (see Aesthetics and Visual Resources above)** **Mitigation Measure 3.12-3: Temporary Shade Structures.** The District shall coordinate with the Town of Ross to select the type and location for installation of temporary shade structures in Frederick Allen Park. The temporary shade structures shall be located along the edge of the Bike Route 20 multi-use path and at seating areas as needed to provide shade during the vegetation establishment period. The temporary shade structures shall be removed when the tree canopy has sufficiently established to provide afternoon shade of the pathway and as determined through coordination with the Town of Ross. The District will submit a draft plan for the shade structures to the Town of Ross no less than 60 days prior to construction. **Mitigation Measure 3.14-1: Traffic Management (see Transportation and Circulation below)**	Less than Significant
Transportation and Circulation			
Impact 3.13-1: The project could conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	Potentially Significant	**Mitigation: Mitigation Measure 3.13-1: Traffic Management** Prior to initiation of construction, the Project contractor(s) shall use a qualified traffic engineer to prepare a Traffic Management Plan (TMP). The TMP shall be developed on the basis of detailed design plans. The TMP shall be reviewed and approved by the District and agencies with jurisdiction over roadways affected by project construction activities prior to construction. Once approved, the TMP shall be incorporated into the contract documents specification. The TMP shall include, but not necessarily be limited to, the elements listed below: • Develop a detour plan for bicycle and pedestrian traffic that shows the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin Parking lot to Ross Common. • Post temporary Bike Route 20 detour and associated signage that meets all the accessibility requirements stated under the Americans with Disabilities Act and CBC Title 24. • Post signs providing public notice of detours at least ~~14~~ 20 days prior to temporary bike route closure. • Provide flaggers at the tennis courts within Frederick Allen Park to provide safe pedestrian access to the tennis courts. • Control and monitor construction-vehicle movements by enforcing standard construction specifications through periodic on-site inspections. • Install traffic-control devices where traffic conditions warrant, as specified in the applicable jurisdiction's standards (e.g., the California Manual on Uniform Traffic Control Devices; Part 6: Temporary Traffic Control); flaggers would be used, when warranted, to control vehicle movements. • Implement a public information program to notify interested parties of the impending construction activities using means such as print media, radio, and/or web-based messages and information. • Comply with roadside safety protocols to reduce the risk of accidents. • Maintain access for emergency vehicles at all times. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways. • Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner as to minimize obstruction to traffic.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact 3.13-2: The project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	Less than Significant	None required.	Less than Significant
Impact 3.13-3: The project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	Potentially Significant	**Mitigation Measure 3.13-1: Traffic Management (see above)**	Less than Significant
Impact 3.13-4: The project would not result in inadequate emergency access.	Less than Significant	None required.	
Tribal Cultural Resources			
Impact 3.14-1: The project could cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	Potentially Significant	**Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources (see Cultural Resources above)**	Less than Significant
Utilities and Service Systems			
Impact 3.15-1: The project would not require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.	Less than Significant	None required.	Less than Significant
Impact 3.15-2: The project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.	Less than Significant	None required.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact 3.15-3: The project would not result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	Less than Significant	None required.	Less than Significant
Impact 3.15-4: The project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.	Less than Significant	None required.	Less than Significant
Impact 3.15-5: The project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	Less than Significant	None required.	Less than Significant
Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics			
Impact 3.16-1: The project would not physically divide an established community.	Less than Significant	None required.	Less than Significant
Impact 3.16-2: The project would not cause a significant environmental impact due to a conflict with any land-use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	No Impact	None required.	No Impact
Impact 3.16-3: The project would not result in substantial alteration of the character or functioning of the community or present or planned use of an area.	Less than Significant	None required.	Less than Significant
Impact 3.16-4: The project would not induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).	Less than Significant	None required.	Less than Significant

ES.11 References

geomorphDESIGN. (2020a, May 27). Unit 4 - Corte Madera Creek Long Profile.

geomorphDESIGN. (2020b, May 6). Corte Madera Creek Lower College of Marin Reach Concrete Channel Removal Project 30% Design Plans.

GHD. (2020a, August 28). Project Component Maps - CAD - 08282020.

Golden Gate National Parks Conservancy. (2018, June). Orthoimagery of the Marin County Imagery Study Area. *Marin_County_Mosaic.sid*.

Stetson Engineers, Inc. (2020, February). Ross Valley Sanitary District - Civil Plans.

Tele Atlas North America, Inc. (2019). U.S. and Canada Detailed Streets GIS dataset. *ESRI® Data & Maps: StreetMap™*. ESRI.

Tele Atlas North America, Inc. (2020). U.S. and Canada Detailed Streets GIS dataset. *ESRI® Data & Maps: StreetMap™*. ESRI.

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Acronyms, Abbreviations, and Glossary

Acronyms and Abbreviations

µPa	micro-Pascals
AB	Assembly Bill
ABAG	Association for Bay Area Governments
ACC	Advanced Clean Cars
BAAQMD	Bay Area Air Quality Management District
Basin Plan	Water Quality Control Plan
Bay Area	San Francisco Bay Area
BMPs	best management practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalRecycle	California Department of Resources Recycling and Recovery
Cal OSHA	California Occupational Safety and Health Administration
CalEEMod	California Emissions Estimator Model®
CANAGPRA	California Native American Graves Protection and Repatriation Act
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCC	Central California Coast
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife

CEC	California Energy Commission
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CGS	California Geological Survey
CH_4	methane
CIP	Capital Improvement Plan
CMCFCP	Corte Madera Creek Flood Control Project
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO_2e	equivalent CO_2
COM	College of Marin
COPCs	contaminants of potential concern
CPUC	California Public Utilities Commission
CRPR	California Rare Plant Rank
CRS	Community Rating System
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
cy	cubic yard
dB	decibels
dBA	A-weighted sound levels
dbh	diameter at breast height
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control

EAP	Energy Action Plan
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ER	Engineering Regulation
ESCP	erosion and sediment control plan
ESLs	Environmental Screening Levels
ESU	Evolutionarily Significant Unit
EWOP	Existing Condition without Project
EWP	Existing Condition with Project
FDS	flood diversion and storage
FESA	Federal Endangered Species Act
FHWG	Fisheries Hydroacoustic Working Group
FIGR	Federated Indians of Graton Rancheria
FWOP	Future Condition without Project
FWP	Future Condition with Project
g	gravity
GASGEM	California Statewide Groundwater Elevation Monitoring
GHG	greenhouse gas
GWP	global warming potential
GPS	global positioning system
HCP	Habitat Conservation Plan
HFCs	hydrofluorocarbons
HMBP	Hazardous Materials Business Plan
HWMs	high water marks
Hz	Hertz

I-580	Interstate 580
in/sec	inches per second
IPCC	International Panel on Climate Change
IWMA	Integrated Waste Management Act
KFPD	Kentfield Fire Protection District
KOPs	key observation points
LCFS	Low Carbon Fuel Standard
L_{eq}	Equivalent Sound Level
LEV	Low-Emission Vehicle
L_{dn}	Day-Night Average Level
LID	low-impact development
L_{max}	Maximum Sound Level
L_{min}	Minimum Sound Level
LOS	Level of Service
MBTA	Migratory Bird Treaty Act
MCE	Maximum Credible Earthquake
MCSTOPPP	Marin County Stormwater Pollution Prevention Program
MMWD	Marin Municipal Water District
MPOs	Metropolitan Planning Organizations
MS4s	Small Municipal Separate Storm Sewer Systems
msl	mean sea level
MTC	Metropolitan Transportation Commission
$MTCO_2e$	metric tons of CO_2 equivalent
N_2O	nitrous oxide
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan

NFIP	National Flood Insurance Program
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NOI	notice of intent
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTDE	National Tidal Datum Epoch
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PBF	physical or biological features
PFCs	perfluorocarbons
PGA	peak ground acceleration
PG&E	Pacific Gas and Electric
PPV	peak particle velocity
PRDs	permit registration documents
Program	Ross Valley Watershed Flood Protection and Watershed Program
RCRA	Resource Conservation and Recovery Act
RVFD	Ross Valley Fire Department
RWQCB	Regional Water Quality Control Board
SAFZ	San Andreas Fault Zone
SARA	Superfund Amendments and Reauthorization Act
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SEL	sound exposure levels
sf	square feet

SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFHA	Special Flood Hazard Areas
SIP	State Implementation Plan
SLC	seal level change
SMN	Science-Math-Nursing building
SMP	Stream Maintenance Program
SOD	Sudden Oak Death
SPF	standard project flood
SPL	sound pressure level
SRA	State Responsibility Area
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
The District	Marin County Flood Control and Water Conservation District
The project	Corte Madera Creek Flood Risk Management Project, Phase 1
TACs	toxic air contaminants
TCP	traditional cultural property
TMDL	Total maximum Daily Load
TMP	Traffic Management Plan
TSCA	Toxic Substances Control Act
TTLCs	Total Threshold Limit Concentrations
US 101	U.S. Highway 101
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

VbD	vibration decibels
VHFHSZ	very high fire hazard severity zones
VMT	vehicle miles traveled
WDRs	Waste District Requirements
WSE	water surface elevation

Glossary

100-year flood event: A flood that statistically has a one-percent chance of occurring in any given year.

Aggradation: The act of raising the grade or level of a stream bed by depositing detritus, sediment, or the like.

Alluvial strata: Consists of unconsolidated mixtures of gravel, sand, clay, and silt typically deposited by streams.

Anadromous: Characterizes the life cycle of a fish that spawns in fresh water and spends a significant portion of its adult life in the ocean. Salmon and steelhead are anadromous.

A-weighted decibel (dBA): Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies.

Backwater flooding: Upstream flooding caused by downstream conditions such as channel restriction and/or high flow in a downstream confluence stream.

Bankfull: The term bankfull refers to the water level stage that just begins to spill out of the channel into the floodplain.

Beneficial reuse: The use of byproducts or waste materials rather than discarding them.

Coarse sediment load: Particulate sediment, varying in size from sand to gravel, that is carried in the body of the flow.

Cofferdam: A watertight enclosure pumped dry to permit construction work below the waterline.

Dam inundation area: The specific areas of land that would become flooded and covered with water if a particular dam were to break or fail.

Emergent groundwater: Groundwater that emerges to the surface of the ground naturally, by an increase in infiltration from stormwater or other water source.

Floodplain: An area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding.

Floodwalls: A primarily vertical artificial barrier designed to temporarily contain the waters of a river or other waterway that may rise to unusual levels during seasonal or extreme weather events.

Groundwater basin: An area underlain by permeable materials capable of furnishing a significant supply of groundwater to wells or storing a significant amount of water.

Hydraulic capacity: The amount of water that can pass through a structure or watercourse.

Hydraulic constriction: A short reach of a creek where the cross-section is reduced.

Left bank: refers to the east or north side of the channel.

Level of service (LOS): A qualitative description of a facility's performance based on average delay per vehicle, vehicle density, or volume-to-capacity ratios. Levels of service range from LOS A, which indicates free-flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

Manning's 'n' factor: The Manning's 'n' is a coefficient which represents the roughness or friction applied to the flow by the channel.

Perennial safe yield: The amount of groundwater that can be withdrawn from a groundwater basin over a period of time without exceeding the long-term recharge of the basin or unreasonably affecting the basin's physical and chemical integrity.

Regulatory floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Right bank: Refers to the west or south side of the channel.

Riparian: The land adjacent to a natural watercourse such as a river or stream. Riparian areas support vegetation that provides important wildlife habitat as well as important fish habitat when sufficient to overhang the bank.

Scour protection: Rock, riprap, or similar materials added to edge of a waterway to protect the banks.

Sediment deposition: The process by which sediment, including soil and rocks, is deposited on the creek bottom due to a loss of kinetic energy in the water.

Sheetflow flooding: Floodwater flows that spread out over a large area at a uniform depth.

Special-status species: Several species known to occur within the general region of the program area are accorded "special status" because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection in federal and/or state endangered species legislation. Others have been designated as "sensitive species" or "species of special concern" on the basis of adopted policies of federal, state, or local resource agencies. These species are referred to collectively as "special-status species."

Streamflow gage: A tool to measure stream-water height and thereby measure the amount of water in the stream.

Threshold conveyance capacity: The flow a creek channel can contain before overtopping its banks.

Vegetated soil lift: A vegetated soil lift consists of soil encapsulated or wrapped in a facing element or fabric such as a rolled erosion control product, or a combination of erosion control products, that also act a reinforcing element.

Watershed: The region or area drained by a river, stream, etc.; drainage area.

1 Introduction

1.1 Planning and Project Review Process

The Marin County Flood Control and Water Conservation District (District) is proposing the Corte Madera Creek Flood Risk Management Project, Phase 1 (project) to reduce 25-year flood risk along Corte Madera Creek in the Town of Ross and unincorporated Kentfield and to enhance natural stream functions. This Draft Environmental Impact Report (EIR) has been prepared by the District to describe the project, evaluate the potential for the project to result in adverse effects on the environment, and to consider alternatives to the project as proposed.

The District, a political subdivision of the state of California, is the California Environmental Quality Act (CEQA) Lead Agency for the project. The District's mission is to reduce the risk of flooding for the protection of life and property by implementing effective, transparent, and responsive planning, design, construction, operation, and maintenance of District-owned facilities such as stormwater pump stations, detention basins, bypass drains, creeks, ditches, and levees. The District provides these services to address specific flooding problems in eight zones1 in Marin County. Corte Madera Creek is within the District's Zone 9.

A Lead Agency is defined by Section 15367 of the CEQA Guidelines as the public agency that has the principal responsibility for carrying out or approving a project. The District intends to use this EIR in a decision process that also involves the Marin County Board of Supervisors, acting as the District Board, to evaluate the environmental impacts of the project and its alternatives. This EIR will become part of a body of evidence that the Board of Supervisors will use in deciding whether or not to approve the project. The District's planning and approval process involves two main steps including (1) circulation of the Draft EIR and (2) certification of the Final EIR and adoption of findings prior to approval of the project or an alternative. The CEQA process includes multiple opportunities for the public to comment on the project and the EIR.

The District is now circulating this Draft EIR to public agencies and members of the public for a 45-day public review period in accordance with CEQA Guidelines Section 15087. Comments should address the adequacy of the Draft EIR. Written comments will be accepted by the District until 4:00 p.m. on the closing day of the review period (March 17, 2021). Written comments should be submitted to the attention of Joanna Dixon, Project Manager at 3501 Civic

[1] These zones are Zone 1: Novato Area; Zone 3: Mill Valley/Coyote Creek Area; Zone 4: Bel Aire Area (Tiburon); Zone 5: Stinson Beach; Zone 6: San Rafael Meadows; Zone 7: Santa Venetia; Zone 9: Ross Valley; and Zone 10: Inverness.

Center Drive, Suite 304, San Rafael, CA 94903, or to cortemaderacreek@marincounty.org. Oral and written comments will be accepted at a hearing on the Draft EIR on Tuesday, March 2, 2021. The hearing will start at 9: 00 am.

After the close of the Draft EIR review period, the District will assemble all comments received during the public review period, including oral comments received at the public hearing on the Draft EIR. As required by CEQA Guidelines Section 15088, the District will evaluate comments received on the environmental issues addressed under CEQA and prepare written responses to each comment. The comments and responses will be included in the Final EIR.

The District will circulate the Final EIR to agencies that commented on the Draft EIR and all interested parties for a minimum of 10 days to review the responses to comments. The District Board will hold a public hearing to evaluate whether the Final EIR complies with CEQA. Notice of the public hearing will be provided in compliance with State law and the County's procedures.

Upon the conclusion of the review, the District Board will consider whether to certify the EIR. In certifying the EIR, the District Board would be affirming that the EIR is adequate and complete pursuant to CEQA requirements. In conjunction with a decision on the project, the District Board would also find that it reviewed and considered the information contained in the Final EIR and exercised its independent judgment prior to taking action on the project or any of the project elements (CEQA Guidelines Section 15090).

No action can be taken to approve the project or any of its elements until the Final EIR has been certified. However, certification of the EIR neither requires nor ensures approval of the project and its elements as evaluated in the EIR. Once the EIR is certified, the District Board may consider approval of the project. At that time, the District Board may decide to approve the project and the mitigation measures specified in the Final EIR, to disapprove the project, or to approve an alternative to the project or elements of alternatives that have been evaluated in the Final EIR.

1.2 Project History

The current project design and approach has been developed as a result of several decades of flood-control planning by the U.S. Army Corps of Engineers (USACE), litigation, and community opposition and concerns about various USACE project proposals. Congress directed the USACE to evaluate possible solutions to flooding in the vicinity of Corte Madera Creek under Section 11 of the Flood Control Act of 1944 in response to numerous flood events in the Corte Madera Creek watershed, including a flood in 1942 that caused major damage to surrounding communities. The Corte Madera Creek Flood Control Project (USACE Flood Control Project) was authorized by Congress in the Flood Control Act of 1962. The USACE Flood Control Project was originally conceived to consist of six units with a concrete-lined channel extending approximately 6.5 miles from the San Francisco Bay upstream into Fairfax. The USACE began construction of Units 1, 2, and 3 of the USACE Flood Control Project in 1969. Construction at the downstream end (Units 1 and 2) created a trapezoidal earthen channel and,

further upstream, a concrete-lined channel part way through the Town of Ross (Unit 3). Construction of Unit 4 as a concrete-lined channel was originally scheduled to begin in 1972, but further implementation of the USACE Flood Control Project beyond Units 1, 2, and 3 was stopped by litigation and environmental concerns from the surrounding community.

On March 5, 1996, the Marin County Board of Supervisors adopted Resolution 96-26, which recognized the need to complete Unit 4 and to redesign Units 2 and 3 under criteria established by the Zone 9 Advisory Board[2]. The criteria included minimizing the use of concrete, retaining adjacent recreational facilities such as the creekside multi-use pathway, using native plants, enhancing riparian and fish spawning habitat, and maximizing the channel capacity while retaining the Lagunitas Road Bridge, an historic structure, as is. The resolution also served as an official request that the USACE proceed with the Project at an overall lower level of design protection, which would meet the environmental concerns of the community. Following another major flood event in 1997, the USACE approved the Project Study Plan for Corte Madera Creek and reactivated the project in 1998. In 2005, following a flood event that damaged the fish ladder and demonstrated that flow restrictions at the Lagunitas Road Bridge existed, the District initiated a reevaluation of flow restrictions and necessary Flood Risk Management measures within the creek. By 2009, the USACE had initiated a General Reevaluation Report for the Project, and the Town of Ross undertook a separate project to replace the Lagunitas Road Bridge.

The USACE, through a local partnership with the District, reinitiated study and design of the USACE Flood Control Project and began preparation of an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Corte Madera Creek Flood Risk Management Project in 2015. The primary goal of the Corte Madera Creek Flood Risk Management Project was to manage flood risk from Corte Madera Creek associated with Unit 4 and to address any potential induced flooding as a result in Units 2 and 3. The USACE published the Draft EIS/EIR in October 2018 and received numerous comments from agencies and the public that indicated there were unresolved environmental issues as well as a lack of local support for elements of the project design.

Upon review of the public comments on the Draft EIS/EIR, the District recognized that additional analysis of project alternatives would be necessary to ensure that public and agency comments were adequately addressed in compliance with CEQA. The additional work would require supplemental funding and time, beyond the congressionally approved budget and schedule authorized for the USACE project feasibility study and as established in the agreement for the "General Reevaluation Report for Corte Madera Creek" (February 19, 2014) between the

[2] The Zone 9 Advisory Board convenes public meetings to review zone budgets, maintenance plans and potential construction projects, and to advise the District Board of Supervisors on all matters affecting Zone 9.

USACE and the District. The District Board of Supervisors decided to terminate the agreement with USACE as of December 31, 2019, and transition the project to a locally managed project.

The project has been redesigned by the District since transitioning the project to local leadership. The current project design reduces the scope of activities and addresses many of the concerns raised by the public in the 2018 Draft EIS/EIR. The current project has been designed in coordination with two stakeholders: Town of Ross, and Friends of Corte Madera Creek Watershed. The project is designed to provide 25-year flood risk reduction to residents and businesses within the Town of Ross and Kentfield. The project includes improvements to the Corte Madera Creek flood control channel within Unit 4, Unit 3, and Unit 2. The project elements and their general purpose and function are described in detail in Chapter 2 Project Description of this EIR.

1.3 Purpose of the EIR and Approach to Environmental Analysis

The fundamental purpose of an EIR is to inform the public and decision-makers of the potential effects of a proposed project on the physical environment. An EIR must therefore include a description of the "environmental setting" of a project (CEQA Guidelines, Section 15125[a]). The "environmental setting" is defined as "the physical environmental conditions in the vicinity of the project, as they exist at the time the Notice of Preparation (NOP) is published. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant" (*ibid*). Therefore, the physical conditions of the project area, the various proposed elements, and the surrounding areas at the time that the NOP was issued constitute the baseline, or point of departure, for the environmental analysis.

1.4 Responsible and Trustee Agencies

This EIR will be used by the District (as Lead Agency) and CEQA responsible agencies to ensure that they have met their requirements under CEQA before deciding whether to approve or permit project elements over which they have jurisdiction. Under CEQA, a responsible agency is a public agency, other than the lead agency, that has responsibility to carry out or approve a project (Public Resources Code [PRC] Section 21069). A trustee agency is a state agency that has jurisdiction by law over natural resources that are held in trust for the people of the State of California (PRC Section 21070).

Certification of the Final EIR by the Board of Supervisors is required before any other discretionary approval or permits would be issued for the proposed project. The project will require subsequent approvals and discretionary actions from responsible agencies including the Town of Ross, California Department of Fish and Wildlife (CDFW), and San Francisco Bay Regional Water Quality Control Board (RWQCB).

The following section discusses the state and local agencies who will serve as responsible and trustee agencies for this project. For a complete list of the anticipated permits and approvals

required for the project, and the agencies responsible for issuing those permits, refer to Chapter 2 Project Description, Section 2.8 Permits and Approvals of this EIR.

1.4.1 California Department of Fish and Wildlife

CDFW authorization of a Section 1602 Lake and Streambed Authorization Agreement is required in order to construct elements of the project within Corte Madera Creek. A 1602 permit is also required prior to removal of riparian vegetation, including trees adjacent to Corte Madera Creek.

1.4.2 San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay RWQCB administers the National Pollutant Discharge Elimination System (NPDES) Permit Program, authorized by the federal Clean Water Act, as well as State laws to protect water quality. The project discharge of dredged or fill material within Corte Madera Creek will require RWQCB authorization through a Clean Water Act Section 401 Water Quality Certification. The Porter-Cologne Water Quality Control Act gives the RWQCB the authority to protect groundwater and surface waters of the State. A Groundwater General Permit would also be required for discharge or reuse of extracted brackish groundwater.

1.4.3 State Lands Commission

The State Lands Commission (SLC) has jurisdiction and management authority over all ungranted tidelands, submerged lands, and beds of navigable lakes and waterways. The SLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, subd. [c]; 6009.1; 6301; 6306). All tidelands and submerged lands granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine. The SLC is a trustee agency for the project because it could directly or indirectly affect State sovereign land and their accompanying Public Trust resources or uses. The project involves work on State sovereign land where the SLC will also act as a responsible agency.

1.4.4 Town of Ross

The Town of Ross owns Frederick Allen Park. The District would ~~will~~ need to obtain Town of Ross approval of an easement for construction and maintenance of project elements on Town property. The District would ~~will~~ enter into a maintenance agreement with the Town regarding maintenance of project elements within Frederick Allen Park. The Town is a responsible agency under CEQA in the review of project elements within Town jurisdiction. The proposed project would require the Town's Design Review approval and an easement for construction and long-term management of the constructed habitats. In addition, a Town of Ross tree removal permit is required prior to removing trees within the Town of Ross.

1.4.5 College of Marin

College of Marin owns properties where staging and stockpiling may occur for project construction. The project also includes new floodwalls within areas that could require new or modified easements from College of Marin. The District would obtain College of Marin

approval for any required new or modified easement prior to construction. Should a new or modified easement be required, the College of Marin is a responsible agency under CEQA in the review of the new or modified easement within the College of Marin properties.

1.5 Notice of Preparation and Scoping

On August 21, 2020, the District issued a NOP of a Draft EIR for the project pursuant to Section 15082 of the CEQA Guidelines. Publication of the NOP started the CEQA 30-day scoping period, during which the District requested comments from responsible and trustee agencies and the public about the scope of the EIR. The 30-day scoping period closed on September 21, 2020. The District held a virtual public scoping meeting on August 27, 2020, regarding the project to solicit agency and public input on the range of environmental effects and alternatives that should be analyzed in the EIR. Oral comments were received at the scoping meeting, and additional written comments were received during the scoping period. The Scoping Summary Report is included in Appendix A of this EIR. A summary of scoping comments is included below, in Table 1.5-1.

Table 1.5-1 Summary of Scoping Comments

Topic	Consideration
Project Description	• Describe Granton Park stormwater pump station. • Show area of temporary and permanent impacts, floodwalls, landscaping, and operational features. • Quantify earth disturbance and cubic yards of off-haul. • Identify trees that will be removed. • Provide details on floodwall and creek location within Frederick Allen Park. • Provide construction schedule. • Identify areas for construction staging and storage of materials. • Define dewatering and species relocation approach. • Define maintenance responsibilities.
Project Objectives	• State the purpose of the "Public Access and Recreational Quality" objective. • State the purpose of the "Fiscally Responsible" objective.
Alternatives	• Provide support for an alternative that only removes the fish ladder • Consider an alternative with floodwall designs that would provide habitat value and would be appropriate for the seawalls on Corte Madera Creek. • Consider an alternative that does not include the project element in the Town of Ross. • Consider an alternative that requires less concrete removal and uses more natural materials. • Consider an alternative that minimizes the need and height of the floodwalls. • Consider an alternative that would eliminate or reduce potentially adverse impacts from sea level rise. • Consider an alternative for area between Sir Francis Drake and Lagunitas Bridge. • Consider an alternative for drainage under Kent Avenue. • Consider an alternative that would address flooding to residents of Sylvan Lane and Shady Lane.

Topic	Consideration
Aesthetics and Visual Resources	• Consider impacts of tree removal on park setting and privacy.
Air Quality	• Consider air quality impacts at Frederick Allen Park from tree removal. • Address air quality impacts during construction.
Biological Resources	• Address impacts on sensitive species (including special-status plants, fish, and wildlife) and habitats. • Address impacts on fish and wildlife from the proposed creek access. • Address fish passage and fish pools improvement effects. • Address introduction of invasive species. • Address noise and vibration impacts on fish and birds. • Address impacts from tree removal. • Discuss revegetation and restoration in the project area. • Provide plans for dewatering and fish rescue.
Cultural and Tribal Cultural Resources	• Obtain approval for the final disposition of archaeological, historical, and paleontological resources recovered on State lands. • Exercise extreme diligence in honoring artifacts uncovered in the project area.
Geology and Soils	• Address impacts from sediment erosion and aggradation in the Frederick Allen Park Riparian corridor. • Incorporate geological information from Marin Countywide Plan into the EIR. • Address impacts on the structural integrity of the existing concrete channel from the proposed fish pools.
Greenhous Gas Emissions	• Address impacts from greenhouse gas emissions during construction and operation and consider impacts from disposal of the concrete that will be removed in Unit 2.
Hazards and Hazardous Materials	• Address potential impacts from waste entering the creek from surrounding areas. • Discuss increasing risk to public safety from the floodwalls and retaining walls. • Address public safety risk at Frederick Allen Park and potential for people to come in contact with rapidly moving water.
Hydrology and Water Quality	• Address impacts from sediment erosion and accumulation, including increased risk of erosion from tree removal. • Address impacts from rising tidal influence and sea level rise. • Address impacts on flow, hydraulics, sediment transport, and sedimentation from new fish pools. • Address impacts from induced flooding in Frederick Allen Park. • Address impacts from overload water flow from Bolinas Avenue, Fernhill, Southwood, Norwood, Ames, and Lagunitas Road. • Address impacts on the flow through Frederick Allen Park. • Discuss flood risk on Kent Avenue. • Discuss accuracy of modeling and calculations. • Compare the 10-year and the 25-year flood risk reduction benefits under existing conditions and existing with cumulative projects. • Address impacts on water quality.

Topic	Consideration
Noise	• Address noise impacts from the stormwater pump station. • Address noise impacts during construction. • Address increased noise from Sir Francis Drake Boulevard due to tree removal.
Recreation	• Address impacts on bicycle route and use of the multi-use pathway. • Discuss impacts on informal pedestrian pathways.
Transportation	• Address safety of bicyclists and pedestrians on realigned multi-use pathway. • Address impacts from construction truck trips. • Address impacts on access. • Address impacts on bike path.
Cumulative	• Address cumulative impacts from reasonably foreseeable future projects in the project vicinity. • Address flooding impacts in Granton Park from the access ramp.
General	• Define CEQA and regulatory procedures applicable to the project. • Address opposition to the project elements with Frederick Allen Park.

1.6 Organization of the EIR

The Draft EIR is organized into seven chapters, including the Executive Summary, preceded by the Table of Contents. A brief summary of the contents of the Draft EIR is presented below.

Executive Summary: The Executive Summary, prepared in accordance with CEQA Guidelines Section 15123, contains an overview of key elements of the Draft EIR and a summary of the project description and characteristics. An overview of project objectives, with reference to the full text version, is provided pursuant to CEQA Guidelines Section 15124. This chapter also presents a comprehensive table of all significant environmental impacts and mitigation measures along with the level of significance before and after mitigation. This chapter also summarizes impacts of the CEQA alternatives as they compare to the project. Descriptions of growth-inducing impacts, irreversible environmental changes, and significant and unavoidable impacts are also provided in this chapter. Also discussed are major conclusions, areas of controversy, and issues to be resolved in the Draft EIR. Finally, the project's consistency with County plans and policies is summarized.

Chapter 1 – Introduction: The Introduction describes the Marin County Planning and Program review process as it pertains to the project, presents the technical documents that are incorporated by reference into the Draft EIR (in accordance with CEQA Guidelines Section 15150), and describes the organization of the Draft EIR.

Chapter 2 – Project Description: The Project Description is prepared pursuant to CEQA Guidelines Section 15124 and contains text, figures, and tables conveying project attributes. Specifically, this chapter includes the project objectives, a description of the project elements and locations, and a description of project construction, operation, and maintenance.

Chapter 3 – Environmental Setting, Impacts, and Mitigation Measures: Chapter 3 contains most of the environmental impact evaluation for the project. A description of the physical and regulatory setting for each environmental issue is provided along with disclosure of the anticipated changes to physical conditions after project implementation. The "environmental setting," for purposes of this Draft EIR, consists of the existing physical conditions of the area affected by the project, including specific sites identified for project elements and their surroundings (pursuant to CEQA Guidelines Section 151259[a]). The existing physical conditions consist of the physical conditions at the time of NOP publication. Analysis of future conditions without project conditions is provided in the consideration of the No Project Alternative in Chapter 5. The impact analysis focuses on the potential changes to the physical environment that may result from the project. Feasible mitigation measures are identified for significant impacts that would result from implementation of the project, as appropriate.

Environmental impacts are numbered throughout this portion of the Draft EIR, beginning with the chapter section number, followed by sequentially numbered impacts. For example, the first impact in Section 3.2 Air Quality is impact number 3.2-1, and the second impact in this section is 3.2-2. Mitigation measures are numbered to correspond to impacts; therefore, mitigation measures to address Impacts 3.2-1 and 3.2-2 would be Mitigation Measures 3.2-1 and 3.2-2, respectively.

Chapter 4 – Growth-Inducing and Cumulative Effects: Chapter 4 includes CEQA-mandated sections examining the potential growth-inducing effects of the project and the project's significant cumulative impacts. Cumulative impacts refer to two or more individual effects that, when considered together, are considerable or compound other environmental impacts. In accordance with CEQA Guidelines Section 15130, the analysis in Chapter 4 examines the project's potential impacts in connection with the effects of other related past, present, and probable future projects.

Chapter 5 – Alternatives: In accordance with CEQA Guidelines Section 15126.6, Chapter 5 of the Draft EIR presents a range of reasonable alternatives designed to feasibly attain most of the basic objectives of the project and avoid or substantially reduce one or more of the project's significant environmental effects. The potential environmental impacts of the alternatives are discussed in comparison to the impacts that would result from the project, and the ability of the alternatives to meet the project objectives is presented.

Chapter 6 – Report Preparation: This chapter identifies the individuals who were involved in the preparation of the Draft EIR.

Appendices: The Draft EIR contains several appendices of technical or procedural materials that are pertinent to the analysis contained in the body of the document. See the Table of Contents for the full list of appendices.

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2 Project Description

2.1 Introduction

The Marin County Flood Control and Water Conservation District (District) is proposing the Corte Madera Creek Flood Risk Management Project, Phase 1 (project). The project is proposed as an element of the District's larger flood control program. The program is being implemented over many phases and multiple creeks throughout the District. Other flood control projects that are proposed for Corte Madera Creek, including Phase 2 of the Corte Madera Creek Flood Risk Management Project, are described in Section 4.3 Cumulative Impacts of this EIR. The District is the California Environmental Quality Act (CEQA) Lead Agency responsible for preparation of this Environmental Impact Report (EIR). The proposed project includes improvements to the concrete Corte Madera Creek flood-control channel constructed by the U.S. Army Corps of Engineers (USACE) in the 1960s and 1970s. The project improvements would be located within the Town of Ross and unincorporated Kentfield. The proposed channel improvements would improve fish passage and provide 25-year flood-risk reduction to residents and businesses within the Town of Ross and Kentfield.

2.2 Project Location

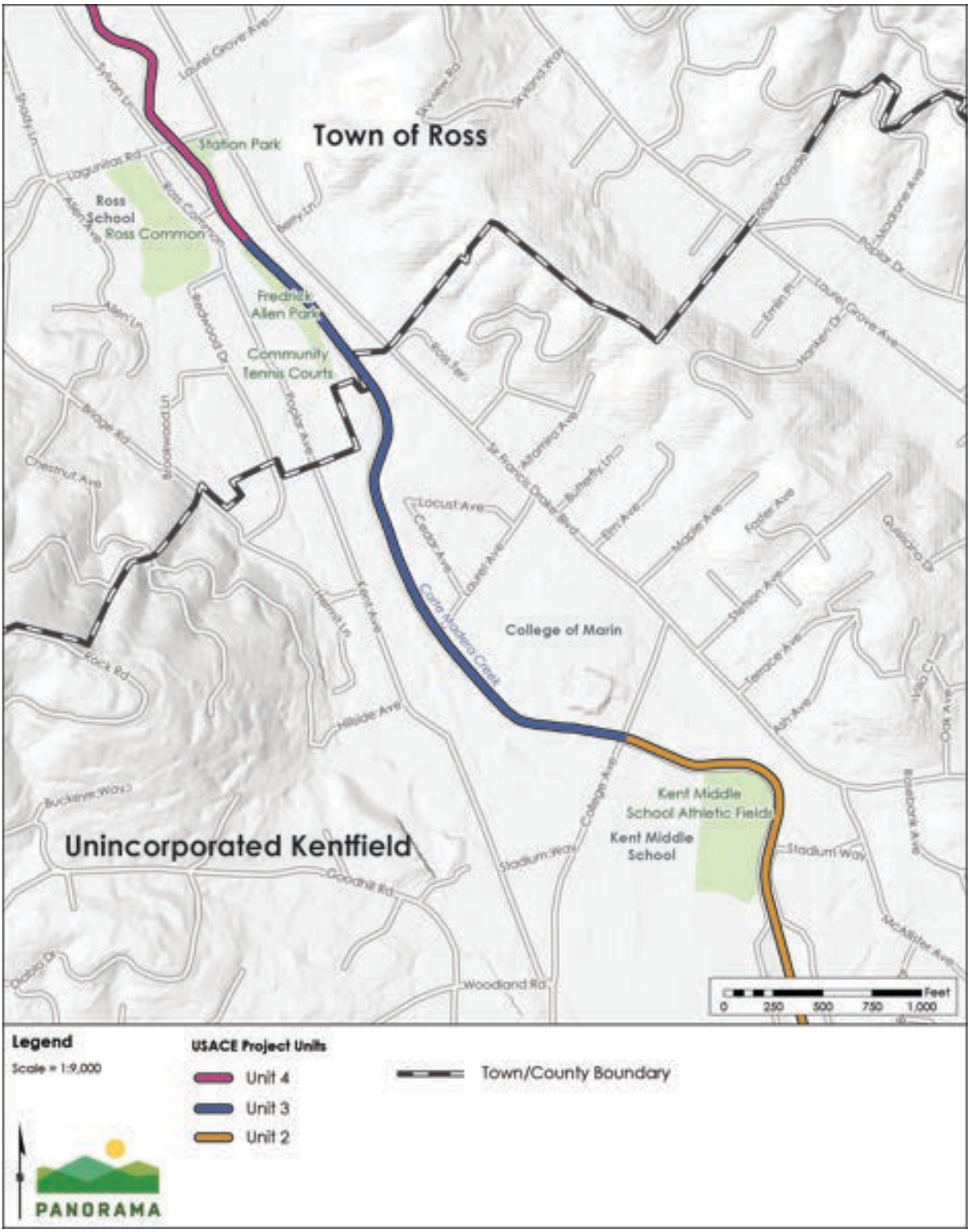
The project is located within the Corte Madera Creek watershed within the Town of Ross and unincorporated Kentfield, in Marin County, as shown in Figure 2.2-1. The project area is divided into three units, Unit 4, Unit 3, and Unit 2, which are based on the original USACE project units, as described in Table 2.2-1 and shown in Figure 2.2-2. Corte Madera Creek within the project area is concrete lined in Unit 3 and Unit 2 and currently has a natural bottom in Unit 4. The project area is approximately 1.4 miles long.

The Corte Madera Creek watershed contains 42 linear miles of stream channels and covers approximately 28 square miles, including areas of unincorporated Marin County and the towns of Corte Madera, Larkspur, Ross, San Anselmo, and Fairfax. Corte Madera Creek discharges into San Francisco Bay, 9 miles north of the Golden Gate Bridge. The Corte Madera Creek watershed's western boundary is a steep, forested ridge. Numerous creeks that drain steep upland areas onto relatively steep and laterally confined alluvial valley flats combine as San Anselmo Creek in Ross Valley at San Anselmo. San Anselmo Creek then flows southeast through Ross Valley. San Anselmo Creek and Ross Creek merge to form Corte Madera Creek west of the Lagunitas Road Bridge ~~flows into Corte Madera Creek west of Greenbrae at the confluence with Ross Creek~~. Upper reaches within the watershed support relatively natural stream channels. The lower ridges and valley areas of the watershed, including areas adjacent to Corte Madera Creek, are highly developed suburban residential and commercial areas. Within the project area, the creek is channelized with a combination of narrow, incised banks and a concrete-lined channel.

Figure 2.2-1 Project Location

Sources: (U.S. Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011)

Figure 2.2-2 USACE Creek Units



Sources: (Tele Atlas North America, Inc., 2019; GHD, 2020h; USGS, 2019; U.S. Geological Survey, 2013)

Table 2.2-1 Corte Madera Creek Units within the Project Area

Unit [a]	Length (miles)	Description of Reach
Unit 4	0.2	Unit 4 extends approximately 0.4 mile downstream from Sir Francis Drake Boulevard and continues approximately 600 feet downstream of the Lagunitas Road Bridge before terminating at the wooden fish ladder. The project segment of Unit 4 starts just upstream of Lagunitas Road Bridge and extends approximately 1,100 feet downstream to the wooden fish ladder.
Unit 3	0.67	Unit 3 begins at the wooden fish ladder at the upstream end of the concrete channel and continues for approximately 0.67 mile to the College Avenue Bridge.
Unit 2	0.57	Unit 2 begins at the College Avenue Bridge and extends downstream beyond the end of the concrete channel, ending near the Tamalpais Creek culvert. The upper and middle (henceforth for the purposes of this project referred to as lower College of Marin concrete channel removal or lower Unit 2) portions of Unit 2 consist of an approximately 0.33-mile concrete channel that extends from the College Avenue Bridge to downstream of Stadium Way. The lowest portion of Unit 2, which is not a part of the project area, extends downstream into the earthen channel to Bon Air Road bridge.

Note:

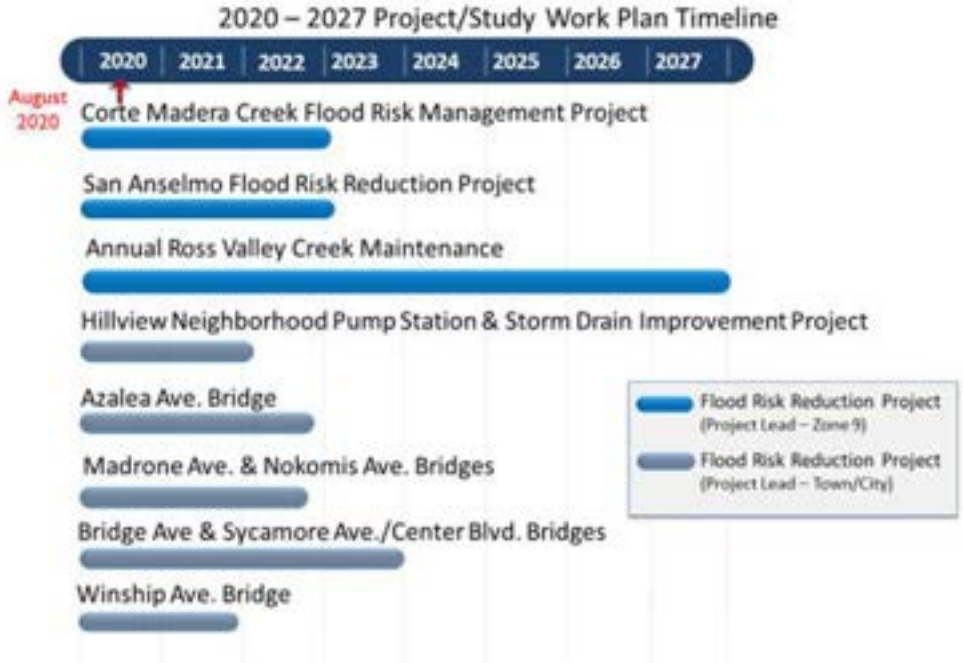
[a] Units are ordered from upstream (Unit 4) to downstream (Unit 2)

2.3 Background

2.3.1 Ross Valley Flood Protection and Watershed Program Summary

Ross Valley has been inundated by flooding over the years, including significant winter storm events in 1956, 1982, 2005, and 2017, causing tens of millions of dollars in damages. The most recent major flood occurred on December 31, 2005. The flood resulted in substantial property damage within the Ross Valley. In January 2006, the Ross Valley Watershed Flood Protection and Watershed Program (Program) was initiated by Marin County Board of Supervisors. The Program was intended to create a comprehensive flood control strategy for the Ross Valley watershed. The Program, which is managed by the District, strives to improve public safety and protect property in the 28-square-mile watershed. The proposed project is one of several flood-risk reduction projects that are currently being planned by the District in the watershed. The work plan for the Ross Valley Flood Protection and Watershed Program is provided in Figure 2.3-1.

Figure 2.3-1 Ross Valley Flood Protection and Watershed Project Study Work Plan Timeline



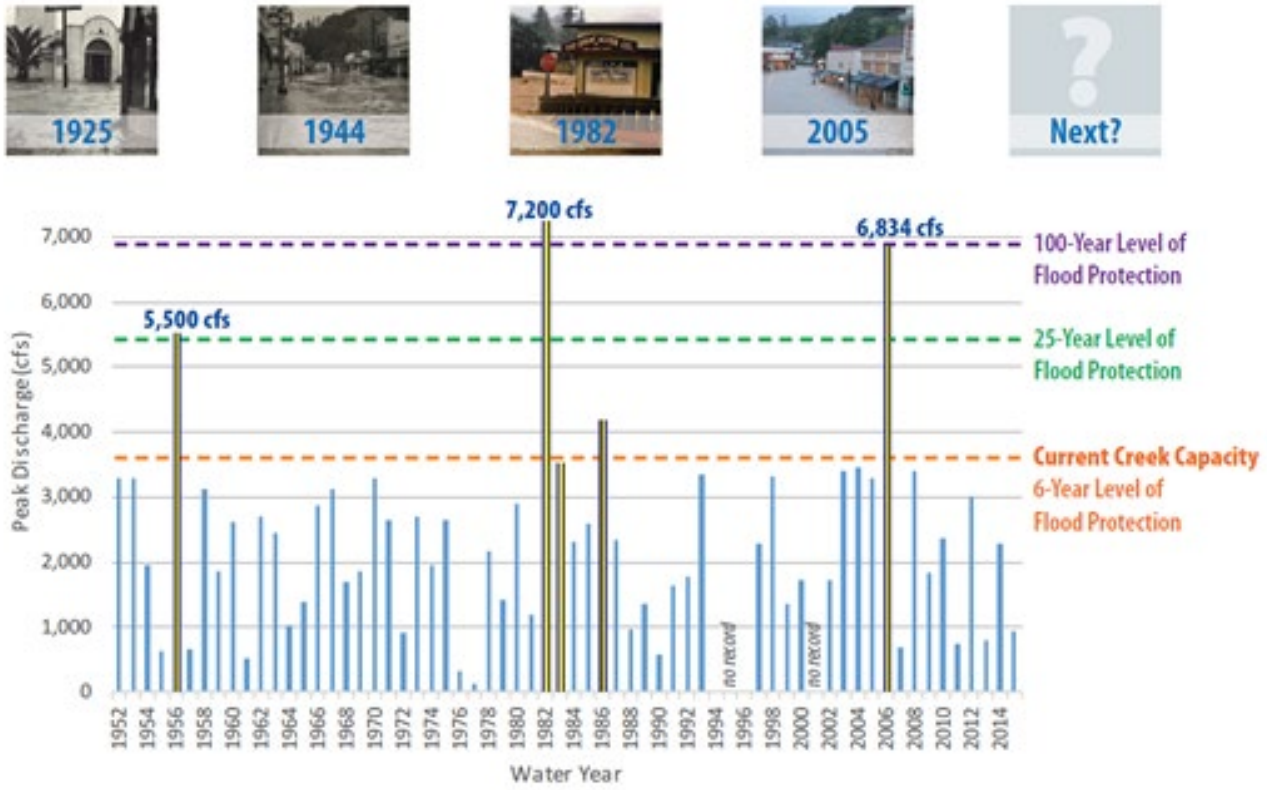
Source: (Marin County Flood Control and Water Conservation District, 2020)

2.3.2 History of Flooding and Flood Control in Ross Valley and the Corte Madera Creek Watershed

Several times in recent history, Ross Valley has been flooded by Corte Madera Creek and its upstream tributaries. Flooding was reported as far back as the 1860s and in calendar years 1914, 1925, 1937, 1940, and 1942 prior to establishment in 1951 of the United States Geological Survey (USGS) streamflow gage in Ross. Corte Madera Creek has flooded the project vicinity numerous times over the past 70 years, causing loss of human life and major damage in nearby communities of San Anselmo, Ross, Kentfield, and Larkspur. Since 1951, flood events have been recorded in calendar years 1951, 1952, 1958, 1967, 1969, 1970, 1982, 1983, 1986, 1993, 2005 and 2017. Of these, the two most severe floods occurred in 1982 and 2005, with peak discharges of approximately 7,200 cubic feet per second (cfs) and 6,834 cfs, respectively.

The percent-annual-chances (i.e., probabilities) of these floods were approximately 0.6 percent and one percent (translating to a 100- to 200-year flood event and a 100-year flood event, respectively) (Figure 2.3-2) (Stetson Engineers, Inc., 2011). Historical flooding has caused extensive property damage and economic hardship to residents, businesses, and local governments. In the 2005 flood, losses to the public and private sector totaled $94,836,880 in 2006 dollars (Marin County, 2012). Following the 1956 flood, Congress directed the USACE to evaluate possible solutions to flooding in the vicinity of Corte Madera Creek under Section 11 of the Flood Control Act of 1944. The Corte Madera Creek Flood Control Project (USACE Flood Control Project) was authorized by Congress in the Flood Control Act of 1962.

Figure 2.3-2 Corte Madera Creek Historical Annual Peak Discharges



Source: (Marin County Flood Control and Water Conservation District, 2020)

The USACE Flood Control Project was originally conceived to consist of six units with a concrete-lined channel extending approximately 6.5 miles from the San Francisco Bay upstream into Fairfax. The USACE began construction of Units 1, 2, and 3 of the USACE Flood Control Project in 1969. Construction at the downstream end (Units 1 and 2) created a trapezoidal earthen channel and, further upstream, a concrete-lined channel part-way through the Town of Ross (Unit 3). Construction of Unit 4 as a concrete-lined channel was originally scheduled to begin in 1972, but further implementation of the USACE Flood Control Project beyond Units 1, 2, and 3 was stopped by litigation and environmental concerns from the surrounding community.

2.3.3 Previous Environmental Review

The USACE, through a local partnership with the District, reinitiated study and design of the USACE Flood Control Project and began preparation of an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Corte Madera Creek Flood Risk Management Project in 2015. The primary goal of the Corte Madera Creek Flood Risk Management Project was to manage flood risk from Corte Madera Creek associated with Unit 4 and to address any potential induced flooding as a result in Units 2 and 3. The USACE published the Draft EIS/EIR in October 2018 and received substantial comments from agencies

and the public that indicated there were unresolved environmental issues and a lack of local support for elements of the project design.

Upon review of the public comments on the Draft EIS/EIR, the District recognized that additional analysis of the project alternatives would be necessary to ensure that public and agency comments were adequately addressed in compliance with CEQA. The additional work would require supplemental funding and time beyond the congressionally-approved budget and schedule authorized for the project feasibility study and as established in the agreement for the "General Reevaluation Report for Corte Madera Creek" (February 19, 2014) between the USACE and the District. The District Board of Supervisors decided to terminate the agreement with USACE as of December 31, 2019 and transition the project to a locally-managed project.

Since project planning shifted from the USACE to local District leadership and management, the project has been substantially redesigned to reduce the scope of activities and address many of the concerns raised by the public in the 2018 Draft EIS/EIR, including omission of a proposed bypass pipeline along Sir Francis Drake Boulevard. The current project has been designed in coordination with two stakeholders: Town of Ross and Friends of Corte Madera Creek Watershed. The project is designed to provide 25-year flood risk reduction to residents and businesses within the Town of Ross and Kentfield. The project includes improvements to the Corte Madera Creek flood control channel within Unit 4, Unit 3, and Unit 2. Additional flood control and stream restoration elements, including additional restoration on College of Marin campus, are being considered for a Phase 2 project on Corte Madera Creek. Separate CEQA documentation and analysis will be required prior to implementation any Phase 2 project components. While Phase 2 has not been fully defined, potential Phase 2 components are described and considered in Section 4.3 Cumulative Impacts of this EIR.

2.4 Project Objectives

CEQA requires EIRs to include a clearly written statement of objectives that succinctly describes the underlying purpose of the project being evaluated. The objectives serve to guide the development and evaluation of a reasonable range of alternatives to evaluate in the EIR and support the decision-making process.

The objectives of the project include the following:

1. **Flood-Risk Reduction.** Reduce overall flood inundation extent and depth in the Town of Ross and Kentfield areas.
2. **Environmental Benefits.** Improve fish passage, natural creek processes, and fish and riparian habitat adjacent to the creek.
3. **Public Access and Recreational Quality.** Maintain public access along the creek via the multi-use path and enhance the recreational experience and amenities along the creek corridor to meet Town of Ross and Kentfield area community needs.

4. **Operational Reliability.** Improve operational reliability and reduce long-term maintenance costs through improving channel stability and protecting existing utilities.
5. **Regulatory Compliance.** Comply with local, state, and federal environmental laws and regulations.
6. **Fiscally Responsible.** Implement a flood-risk reduction project that can be accomplished with local and reasonably foreseeable grant-funding opportunities.

The primary drivers for the project are reduction in flood risk and improvement in ecological functions, including fish passage. Implementing the project would reduce the frequency of flooding in the Town of Ross and Kentfield and reduce the severity of flooding by reducing the total area of inundation adjacent to Corte Madera Creek. The flood risk reduction benefits of the project are demonstrated in the hydraulic modeling results for the change between existing conditions and proposed-project condition modeling. Hydraulic modeling results for the 10-, 25-, and 100-year flood events are presented in detail in Section 3.9 Hydrology and Water Quality.

2.5 Project Elements and Design

2.5.1 Proposed Project Element Types

The proposed project includes project elements that would increase flow conveyance capacity, provide flood protection, and/or enhance habitat within Corte Madera Creek. The project elements and their general purpose and function are described below. The proposed project elements are shown on Figure 2.5-1 through Figure 2.5-3.

Increase Creek Flow Conveyance Capacity

Project elements that increase creek capacity allow a greater volume of water to flow in-channel rather than overflowing along the streets and floodplains and flooding adjacent areas. Maximizing the in-channel flood-flow capacity is accomplished by widening and/or deepening certain sections of creeks in the watershed, creating and/or restoring functional floodplains, and modifying, removing, or replacing structures, including bank protection, that encroach into the creek. Capacity-increasing project elements that would be constructed as part of the proposed project include the following:

- Removal of the concrete channel and widening the channel within Frederick Allen Park
- Removal of the fish ladder at the upstream limit of Unit 3
- Regrading and lowering the channel in Unit 4
- Installation of new grade control and slope protection in Unit 4 and Frederick Allen Park
- Floodplain expansion and partial concrete channel wall removal in Unit 2 at the downstream of Stadium Way bridge.

Figure 2.5-1 Project Elements (Map 1 of 3)

Source: (GHD, 2020a) (Stetson Engineers, Inc., 2020) (geomorphDESIGN, 2020a) (Tele Atlas North America, Inc., 2019) (Golden Gate National Parks Conservancy, 2018)

Figure 2.5-2 Project Elements (Map 2 of 3)

Source: (GHD, 2020a) (Stetson Engineers, Inc., 2020) (Tele Atlas North America, Inc., 2019) (Golden Gate National Parks Conservancy, 2018)

Figure 2.5-3 Project Elements (Map 3 of 3)

Source: (GHD, 2020a) (geomorphDESIGN, 2020b) (Stetson Engineers, Inc., 2020) (Tele Atlas North America, Inc., 2020) (Golden Gate National Parks Conservancy, 2018)

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Flood Protection Elements

Flood-protection elements are structures that play an essential role in diverting water away from communities or reducing flooding within communities that occur adjacent to the creek. Flood-protection elements, such as short floodwalls, protect communities within the floodplain by maintaining flow in the creek. Flood-protection elements that would be constructed as part of the proposed project include the following:

- New/modified short floodwalls (approximately 2 to 4 feet tall) in Unit 3 and Unit 2
- Stormwater pump station with backup power in Granton Park

Elements that Enhance Creek Habitat

Creek habitat enhancement involves increasing natural conditions both in the channel and adjacent to the creek by removing concrete and structures that restrict flow, obstruct fish passage, or block natural vegetation establishment. Corte Madera Creek provides important habitat for threatened and endangered species including but not limited to salmonids, particularly resident rainbow trout and steelhead trout, as well as the Ridgway's rail and the salt marsh harvest mouse, which occupy the tidal marshes downstream of the project area. The tidal marsh, freshwater aquatic, and creek riparian habitats have all been reduced and degraded by human activities. Salmonids returning from the ocean to spawn in Corte Madera Creek must first enter the downstream outlet of the concrete flood control channel near the College of Marin and pass upstream through the channel to enter the still largely natural creek corridor behind the Ross Post Office. The Denil fish ladder and the existing concrete channel have been identified as impediments to fish passage because typical natural flows during the migration season produce shallow, high-velocity flows on the smooth concrete bed, there are insufficient resting pools for fish passage, and there is no pool below the fish ladder to accommodate fish attempting to jump up the ladder.

Habitat enhancement elements included in the proposed project would create conditions that promote fish habitat and passage and restore tidal, wetland, and riparian habitat along the creek. Habitat-enhancing project elements included in the proposed project include the following:

- Removal of the Denil fish ladder
- Riparian vegetation plantings in Frederick Allen Park
- New and enlarged fish pools within the concrete channel in Unit 3
- Removal of a portion of the concrete channel and restoration of tidal wetland and transitional habitat in Unit 2.

2.5.2 Project Design

Project elements proposed within Unit 4, Unit 3, and Unit 2 of Corte Madera Creek are summarized in Table 2.5-1 and shown on Figure 2.2-2. A detailed description of the elements within each unit is provided following the table.

Table 2.5-1 Proposed Project Elements by Creek Unit

Unit	Description of Project Element
Unit 4	• **Capacity-increasing elements.** The grade of the channel would be lowered, the channel would be widened, and the channel elevation and banks would be stabilized through installation of grade-control structures and bank stabilization. • **Habitat-enhancing elements.** The Denil fish ladder would be removed, and riparian vegetation would be planted along the creek banks to increase vegetation and water interaction within the creek.
Upper Unit 3 (Frederick Allen Park)	• **Capacity-increasing elements.** The concrete channel would be removed, and a new, wider earthen channel and floodplain would be constructed within the existing channel and Frederick Allen Park. • **Flood-protection elements.** New floodwalls would be installed along the park to protect adjacent private property. • **Habitat-enhancing elements.** Habitats in and around the creek would be enhanced within the park by removing the concrete channel and planting vegetation along the creek banks to provide increased shade and interaction between water and vegetation, thereby providing more natural creek conditions.
Unit 3	• **Flood-protection elements.** New and modified floodwalls would be installed within the Granton Park neighborhood. A new stormwater pump station would also be constructed. • **Habitat-enhancing elements.** New and enlarged fish pools would be constructed within the concrete channel in Unit 3.
Unit 2	• **Flood-protection elements.** A new floodwall would be constructed along the upper reach of Unit 2. • **Habitat-enhancing elements.** Creek habitat would be enhanced by replacing the concrete channel with an earthen channel and vegetation downstream of Stadium Way ~~Avenue~~. • **Improvement elements.** Replacement of existing storm drains. Improvements to the existing multi-use path and creation of an adjacent vest pocket park.

2.5.3 Project Features Within Each Unit

Unit 4

The proposed work within Unit 4 would occur within the lower reach of the unit from the upstream end of the existing concrete channel to approximately 150 feet upstream of the Lagunitas Road Bridge. Proposed project activities include removal of the existing fish ladder, grading within the channel and banks to maintain channel geomorphic stability and increase hydraulic capacity, transition structure from the natural channel to the concrete channel, and channel stabilization measures including planted rock, vegetated soil lifts, erosion-control fabric, and engineered streambed material.[1] The improvements also include installation of

[1] Engineered streambed material is a well-graded rock material that includes a gradation of boulders, cobbles, gravel, and sand.

riprap and short cast-in-place concrete walls adjacent to existing concrete walls to reinforce those walls. Unit 4 elements are described below and shown on Figure 2.5-1.

Fish Ladder Removal and Transition Element
The Denil fish ladder would be replaced with a combination of natural bed material and biotechnical bank stabilization or stone protection treatments to eliminate the hydraulic jump and create a smooth transition between Unit 3 and Unit 4. The transition element would extend approximately 80 feet upstream from the existing concrete channel inlet and would involve grading the channel and banks to provide a hydraulically gradual and smooth transition from the upstream natural channel with sloping banks to the downstream Unit 3 channel at Frederick Allen Park with vertical retaining walls. Concrete or riprap aprons would be constructed to extend vertically up the creek banks and meet the existing concrete channel downstream of the transition element. New concrete retaining walls up to 10 feet tall and matching the downstream retaining wall height at Frederick Allen Park would be constructed at the top of the concrete apron. The existing wooden retaining walls would be abandoned.

Channel Stabilization, Grade Control and Reinforcement
As a result of removing the fish ladder, channel modifications would be necessary to accommodate the change in flow dynamics. This would also create the need to modify and lower the channel floor elevations to allow for a smooth transition and geomorphologically stable channel bed. The channel bed modification would extend from the fish ladder to approximately 150 feet upstream of Lagunitas Road Bridge. Approximately 115 feet of the natural channel between Lagunitas Road Bridge and the fish ladder would be widened to increase hydraulic conveyance capacity.

Site-specific creek-bank toe protection and bank stabilization would be installed. Toe protection may include a new buried rock keyway, bioengineered stabilization using willows and other native planting, and reinforced concrete wall. Additional channel stabilization and reinforcement would include installation of erosion-control fabric and engineered streambed material. While most of the anticipated improvements would be completed within property owned by the District, some of the toe protection work would occur along the bottom of the creek banks within the adjacent private properties. Each stabilization and reinforcement technique is described below and shown in Figure 2.5-1.

- **Buried rock keyway.** Large rock (half ton) would be installed ("planted") directly upstream of the proposed transition element and further upstream. Approximately 130 to 140 square feet of rock would be installed on each creekbank to protect the proposed transition element from scour. Approximately 1,385 square feet (265 linear feet) of planted rock would also be installed along the Unit 4 left[2] bank adjacent to private property to protect the creek bank and existing gabion basket

[2] Project features are identified as located on the right or left bank of the creek as viewed when facing downstream.

wall from scour. Along the right creekbank, approximately 790 square feet (105 linear feet) of planted rock would be installed along the creekbank near the Ross Post Office.

- **Biotechnical stabilization.** Biotechnical stabilization would occur through the installation of vegetated soil lifts[3]. Approximately 530 square feet of vegetated soil would be installed along the creekbank adjacent to the Ross Post Office. The vegetated soil would be installed upslope of the planted rock.
- **Erosion-control fabric**. A double layer of erosion-control fabric would be installed along creekbank upstream of the transition element and along the creekbank near the Ross Post Office, above the installed vegetated soil lift.
- **Engineered streambed material.** Approximately 660 square feet of engineered streambed material would be installed directly upstream of the transition element.
- **Reinforced concrete sister wall** A new reinforced concrete sister wall would be constructed adjacent to an existing concrete retaining wall to reinforce the toe of the existing wall. The reinforced concrete sister wall would extend 75 linear feet on the left bank adjacent to private property at 27 Sir Francis Drake Blvd.

Frederick Allen Park

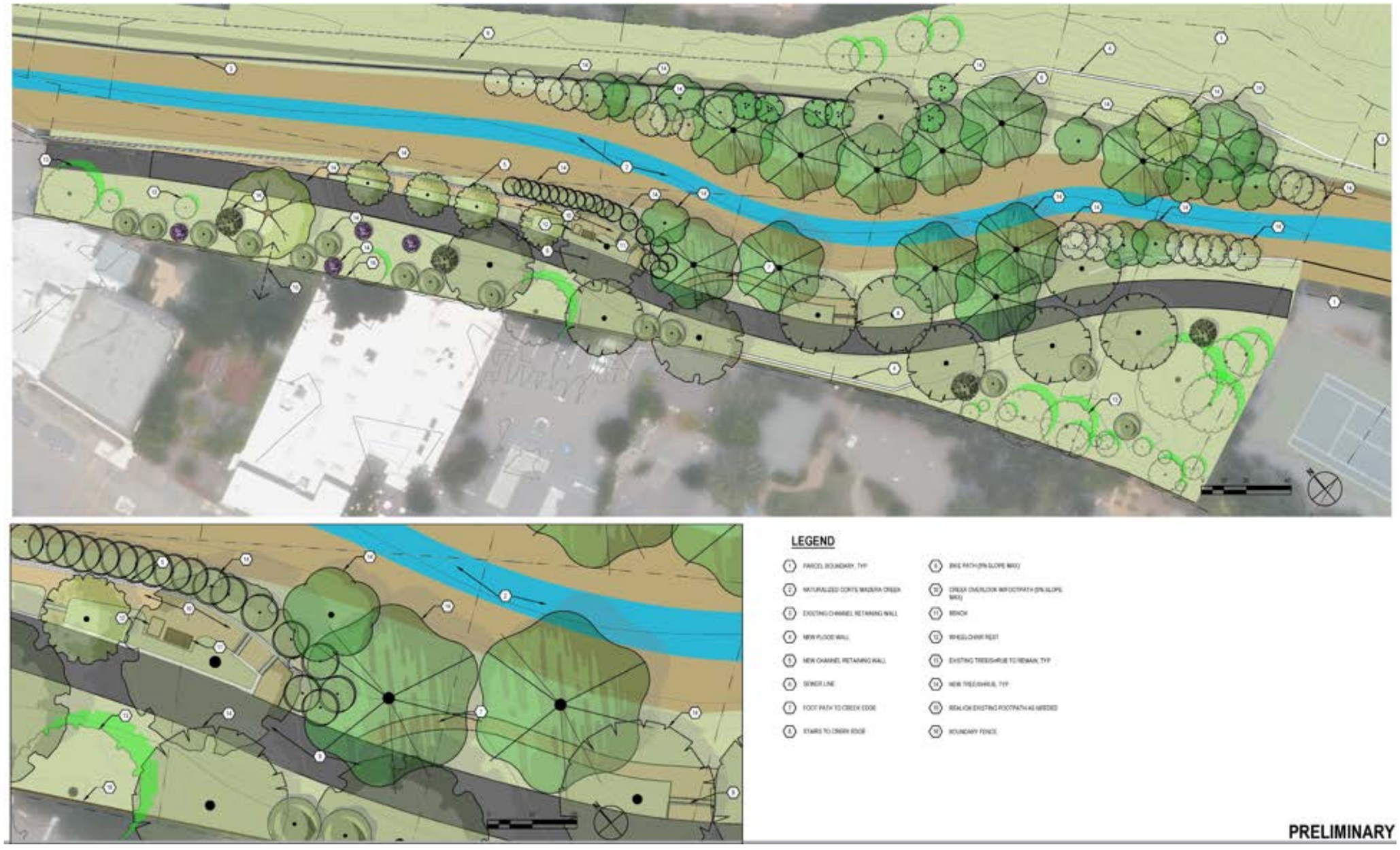
Project elements proposed within Frederick Allen Park would occur within the park boundary owned by the Town of Ross and on District property (i.e., within the existing concrete channel) in the upper reach of Unit 3. The Frederick Allen Park improvements include removal of the concrete channel, construction of concrete floodwalls, removal of trees (see Section 2.6.2), and excavation and grading within the channel and park to provide creek corridor widening and natural floodplain benches and banks connecting to Frederick Allen Park. The improvements also include new landscaping and a pedestrian path within the park. Elements proposed within Frederick Allen Park are described below and shown on Figure 2.5-1 and Figure 2.5-4. The tree removal and planting plan is provided in Appendix B.

Short Floodwalls

New short, cast-in-place floodwalls, would be constructed along the western and eastern edge of the Frederick Allen Park area with a height of up to 2 feet above grade. The western floodwall would begin approximately 330 feet downstream of the existing fish ladder, and would extend 80 linear feet along the western edge of the park boundary. The eastern floodwall would be approximately 2-feet high and would extend 240 linear feet. The eastern floodwall would be located on District property, adjacent to 11 and 3 Sir Francis Drake Boulevard on the eastern (left) bank of the creek.

[3] A vegetated soil lift consists of soil encapsulated or wrapped in a facing element or fabric such as a rolled erosion-control product, or a combination of erosion-control products, that also act as a reinforcing element.

Figure 2.5-4 Frederick Allen Park Site Plan



Source: (GHD, 2020g)

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Channel Improvements

Upstream of the Kentfield Hospital Bridge within Frederick Allen Park, Corte Madera Creek would be restored to a more natural appearing and functioning stream. The existing concrete channel and walls between the fish ladder and approximately 200 feet upstream of Kentfield Hospital Bridge would be removed and replaced with natural substrate. The channel corridor in Frederick Allen Park would include a natural geomorphic channel with channel meander and connected riparian floodplain. The change in channel conditions would be created by widening and re-grading the channel along the left and right banks. The left bank would be sloped, and the top of the channel would shift approximately 10 to 15 feet to the east within the District's property. The channel meander would create a low bar or bench on the left bank, which would be inundated frequently by floods. The channel would be widened on the right bank, on District and Town of Ross property. Frederick Allen Park would be re-graded and re-designed to provide a new, small floodplain bench by lowering a portion of the existing park. The floodplain bench would be approximately 8 feet lower than the existing ground elevation within the park and would be hydraulically connected to Corte Madera Creek, with the intent that this area would flood during high water events. The floodplain on both sides of the creek would be revegetated with willows and other riparian vegetation to establish riparian habitat adjacent to the creek. Short floodwall segments, approximately 2 feet tall, would be installed on the left and right banks and are incorporated into the landscape design for the park.

Park Improvements

Park improvements would include construction of a new pedestrian path and tree planting adjacent to the path to shade the realigned pathway. The existing multi-use path in the park would be relocated along the western edge of the park to allow additional room for the floodplain and natural channel. Resting areas with seating and educational signage would be constructed along the realigned pathway. The pathway would gently lower in grade by less than five percent along this newly realigned length from the tennis courts to the park entrance. From the low point in the pathway, boulders would provide areas for seating and access to the natural creek channel. A retaining wall would be installed at the entrance to the park, and benches would be provided at an overlook area. A short wall or fence would be installed at the top of the retaining wall and any areas with steep drops for safety. A split rail fence would also be installed along the length of the new top of the channel to prevent encroachment into habitat areas. The split-rail fence could be removed after the habitat is established. Trash receptacles would be placed at seating areas. Graphics showing the proposed park improvements at the time of construction, five years after construction, and 10 years after construction are provided in Section 3.1 Aesthetics.

Unit 3

The proposed work within the lower reach of Unit 3 includes the construction of floodwalls, a storm drain pump station at Laurel Avenue, adjacent to the channel's left bank, and up to 16 fish pools within the channel. Elements proposed within the lower reach of Unit 3 are described below and shown on Figure 2.5-2.

Floodwalls

Two floodwall segments would be constructed in the lower reach of Unit 3. A new floodwall would be constructed along the left bank on the upstream side of the College Avenue bridge. Approximately 60 feet of new floodwall would be constructed and designed to function as a wing wall to divert channel flow to Corte Madera Creek at the College Avenue bridge crossing. The floodwall would be 2 to 4 feet tall with the exception of small low-lying areas where the wall could be up to6 feet in height.

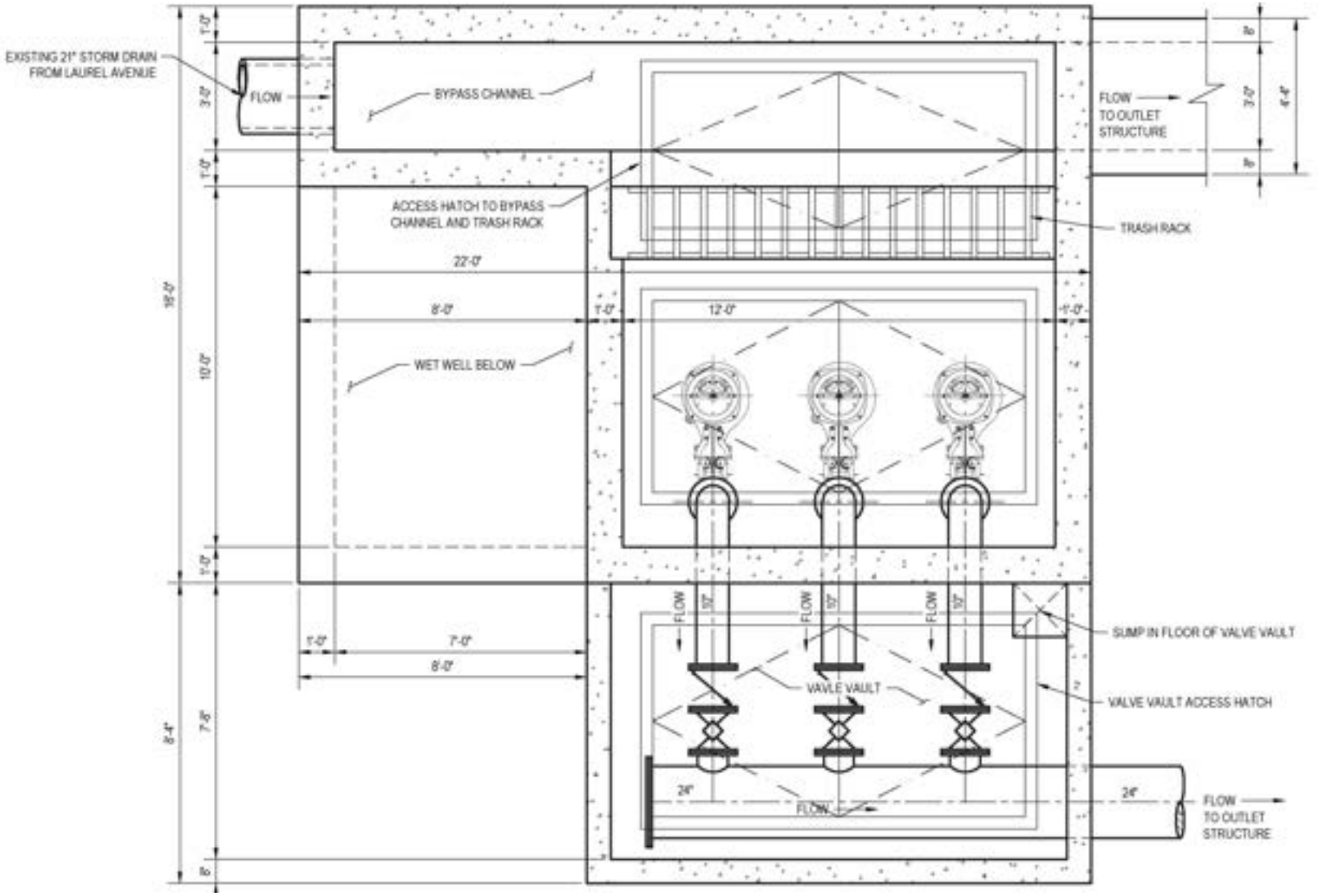
The existing concrete channel floodwall, which currently extends to grade, would be extended vertically along the left bank of Unit 3, upstream of the College of Marin Science-Math-Nursing building (SMN) Bridge. The addition to the existing concrete floodwall would extend along approximately 1,075 feet of the concrete channel, would be one foot wide, and 2 to 4 feet high above the existing concrete channel. The floodwall would be constructed on top of the existing concrete channel wall as a structural extension of the existing channel structure or would be set back a few feet from the existing wall to provide additional flood control. If constructed on top of the existing wall, a fence would be installed as needed for public safety.

Stormwater Pump Station and Backup Power

A new stormwater pump station would be constructed adjacent to the left bank of the concrete channel, approximately 250 feet upstream of the SMN Bridge. The pump station would be located within the District's property at Laurel Avenue. The pump station would convey runoff from the Granton Park neighborhood and the tributary area to the east of Sir Francis Drake Boulevard into Corte Madera Creek. The pump station would supplement the two existing storm drain pipelines in the area that currently discharge water to the channel via gravity flow. The pump station would run only during high channel water levels concurrent with a storm event, when water backs up to the storm drainpipes along Laurel Avenue. The pump station would be designed with 25-year storm capacity when the largest pump in the pump station is off and 100-year-storm maximum capacity.

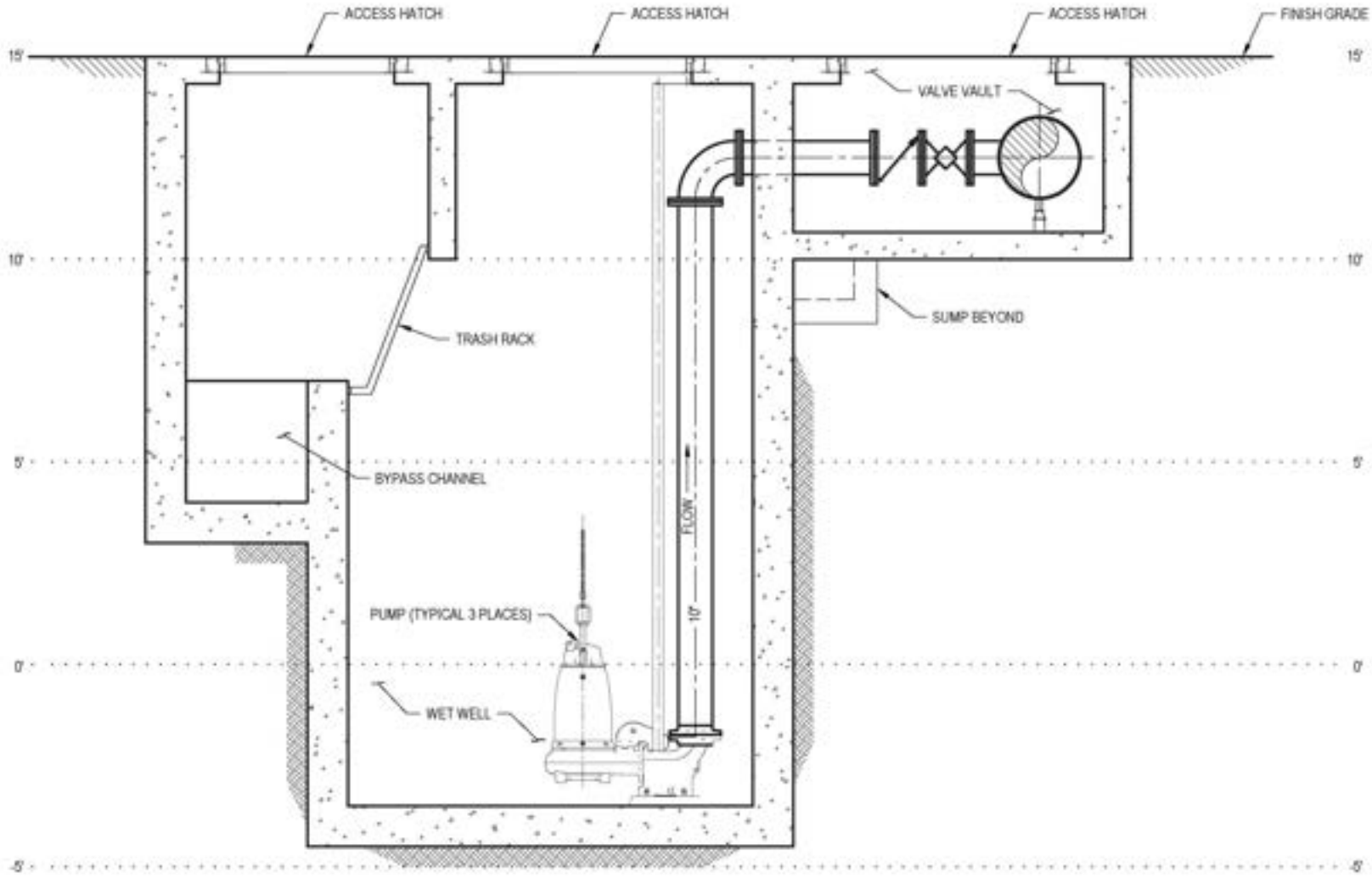
Most of the pump station components would be underground in order to minimize visual impacts to the surrounding community. The underground components would include a 90-cubic-yard concrete vault for the wet well, bypass channel, valve vault, and two new backflow preventers at the existing storm drainpipe outfalls to the channel. The aboveground component would include an 80-square-foot concrete pad with a mounted 150-kilowatt (kW) backup power generator and a mounted motor control center. The backup generator would be powered by biodiesel, if possible, or regular diesel if necessary, and would have a self-contained enclosure with fuel storage. The project would not include storm drain pipeline improvements for flow conveyance to the pump station. The pump station would be designed assuming no upstream restriction of flow conveyance to the wet well. See Figure 2.5-5 and Figure 2.5-6 for details of the belowground pump station components.

Figure 2.5-5 Stormwater Pump Station Plan View



Source: (GHD, 2019)

Figure 2.5-6 Stormwater Pump Station Cross-Section View



Source: (GHD, 2019)

Fish Pools

The project would involve the addition of up to 16 new fish resting pool structures in the concrete channel within Unit 3. The upper 1,900 feet of Unit 3 currently contains 28 small concrete fish pools (4 feet wide and 13 feet long) placed in the center of the stream, spaced approximately 64 feet apart. The new fish pools are intended to provide more efficient resting locations for upstream migrating steelhead and potentially for Coho salmon, which formerly inhabited Corte Madera Creek. The proposed new fish pools would be 1.5 to 3 feet deep and spaced approximately 150 feet apart in the channel. The design of the proposed new fish pools is shown in Figure 2.5-7.

Unit 2

The proposed work within Unit 2 includes the construction of a floodwall on the east side of the existing flood channel adjacent to the College of Marin, and removal of the concrete channel downstream of Stadium Way to restore natural creek function and create tidal and wetland habitat. The Unit 2 project elements are shown on Figure 2.5-3 and Figure 2.5-8.

Floodwall

The floodwall within Unit 2 would be located along the left bank from approximately College Avenue to approximately 200 feet upstream of the Stadium Way pedestrian bridge. The floodwall would be 2 to 4 feet tall, one -foot wide, and approximately 945 feet long, but could extend up to 6 feet high in low lying areas. The floodwall would be built on top of the existing concrete channel wall as a structural extension of the existing structure or set back from the existing wall. The purpose of the floodwall in this section is to avoid increased flood inundation in areas adjacent to Unit 2, including the residential and commercial area between Corte Madera Creek and Sir Francis Drake Boulevard.

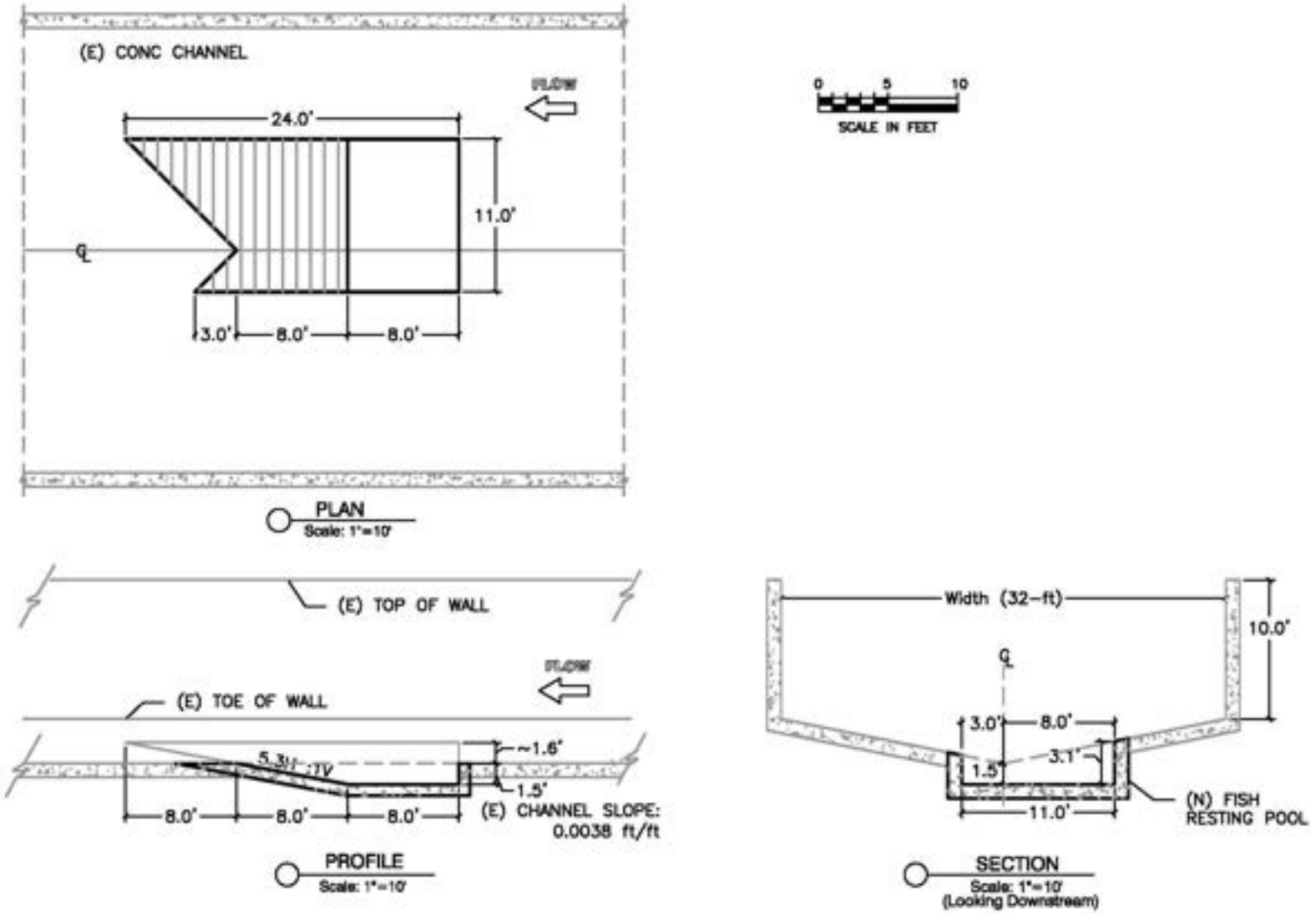
Channel Improvements

The Unit 2 lower College of Marin concrete channel removal would create approximately 0.35 acre of tidal and wetland habitat and 0.46 acre of upland transitional habitat by removing or lowering approximately 625 linear feet of concrete flood channel wall. Habitat created in the earthen channel area would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. The habitats that would be created by the lower College of Marin concrete removal are shown on Figure 2.5-8. Rock and fill energy dissipators, a vegetated bioretention basin, and boulder-lined bioswales would be installed within the newly created ~~channel~~ habitats, including the transition zone. The new vegetated bioretention basins and bio-swales would be constructed to handle stormwater run-off. The existing concrete storm drains would be removed.

Park and Path Improvements

A vest-pocket park ~~would be created~~ adjacent to the existing multi-use path would be enhanced~~. The upland habitat around the pocket park would be enhanced~~ by planting native ~~understory~~ vegetation ~~beneath the existing trees~~. The two existing trees in the area would be preserved.

Figure 2.5-7 Proposed Fish Pool Design



Source: (Mike Love & Associates and Jeff Anderson & Associates, 2007)

Figure 2.5-8 Lower College of Marin Concrete Channel Removal Habitat Creation

Sources: (Prunuske Chatham, Inc., 2020; Golden Gate National Parks Conservancy, 2018; Tele Atlas North America, Inc., 2020)

2.6 Project Construction

2.6.1 Summary of Temporary Work Area and Permanent Modifications

Project construction would require temporary work areas and would result in permanent modifications along the Corte Madera Creek channel. The temporary work area for each construction activity is identified in Table 2.6-1. Temporary work areas are shown on Figure 2.6-1.

Table 2.6-1 Temporary Work Area and Permanent Modifications by Element

Unit	Element	Temporary (sf)	Permanent (sf)	Total (sf)
Unit 4	Fish ladder removal and Unit 4 grading	6,375	3,625	10,000
Unit 3	Frederick Allen Park	0	60,000 [a]	60,000
	Fish pools	0	5,000	5,000
	Floodwall (segment #3)	5,400	1,100	6,500
	Stormwater pump station	1,380	520	1,900
	Floodwall (segment #2)	325	65	390
Unit 2	Floodwall (segment #1)	4,750	950	5,700
	Lower College of Marin concrete channel removal	0	80,419 ~~86,250~~ [a, b]	80,419 ~~86,250~~
N/A	Staging areas	52,700	0	52,700
	Total	**70,930**	**157,510**	**228,440**

Notes:

sf = square feet

[a] Total work area from concrete removal in Unit 2 and Frederick Allen Park are counted as permanent modification where the concrete channel will be replaced with wetland and riparian habitats.

[b] Based on the 65 percent design plan the area of permanent modifications may be smaller.

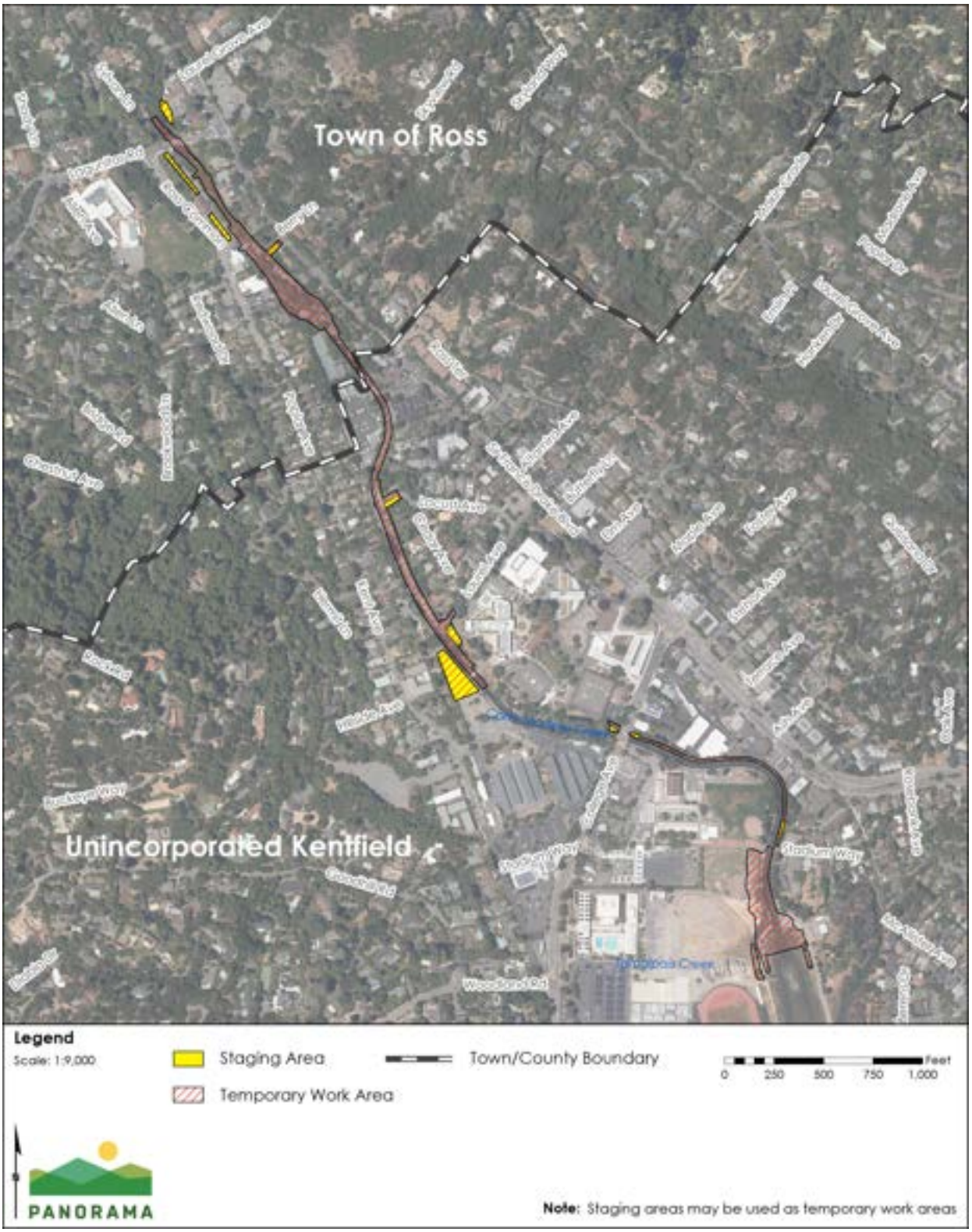
Source: (GHD, 2020b; geomorphDESIGN, 2020c)

2.6.2 Site Preparation

Staging and Stockpiling

Proposed staging and stockpiling areas are shown on Figure 2.6-1 and have been limited to properties owned by or easements granted to the District as well as some properties owned by the Town or Ross or College of Marin. In addition to defined staging and stockpiling areas, project work areas could be used for staging, stockpiling, and storage as needed. Vegetation within the staging and stockpiling areas would be trimmed and removed, and the limits of the work area would be fenced at the start of construction. The contractor may lay aggregate base in unpaved staging areas if needed for stabilization. Any imported aggregate base would be removed at the completion of project staging and stockpiling activities.

Figure 2.6-1 Staging, Stockpile, and Temporary Work Areas



Sources: (GHD, 2020d; Golden Gate National Parks Conservancy, 2018; Tele Atlas North America, Inc., 2019)

Vegetation Removal and Fencing

Each construction phase would begin with site preparation activities, which would include vegetation removal, tree removal, and fencing the construction site. Vegetation and trees within the project work areas would be removed to avoid conflicts between existing vegetation and proposed project elements. The maximum number of trees that would be removed during construction from Units 4, 3, and 2 are listed in Table 2.6-2 and shown on Figure 2.6-2 through Figure 2.6-5. Refer to Appendix B for details on the trees proposed for removal including information on species, size, health, and whether the tree is classified as protected, significant, or heritage by local regulations for each tree that would be removed in each project area. The maximum estimate of tree removal includes all trees that may be removed to address Section 408 requirements for a 15-foot setback from floodwalls. The actual number of trees that would be removed along the proposed floodwalls in Segments 2 and 3 would be determined during the Section 408 authorization process and may be substantially less than the maximum estimate included in the table and figures below. USACE could require removal of any trees located within 15 feet of the existing floodwall based on USACE guidance. The trees located within 15 feet of the existing floodwall are shown as a separate category of tree removal on Figure 2.6-2 through Figure 2.6-5 to indicate that some trees could need to be removed under existing conditions. The figures show all trees within 15 feet of the existing concrete channel, including those that are not proposed for removal by the proposed project.

Table 2.6-2 Tree Removal by Unit

Unit	Element	Number of Trees to be Removed[a]
Unit 4	Fish ladder removal and Unit 4 grading	21
Unit 3	Frederick Allen Park [b]	144
	Fish pools	0
	Floodwall (segment #2)	3
	Floodwall (segment #3)	83
	Stormwater pump station	8
Unit 2	Floodwall (segment #1)	71
	Lower College of Marin concrete channel removal	39

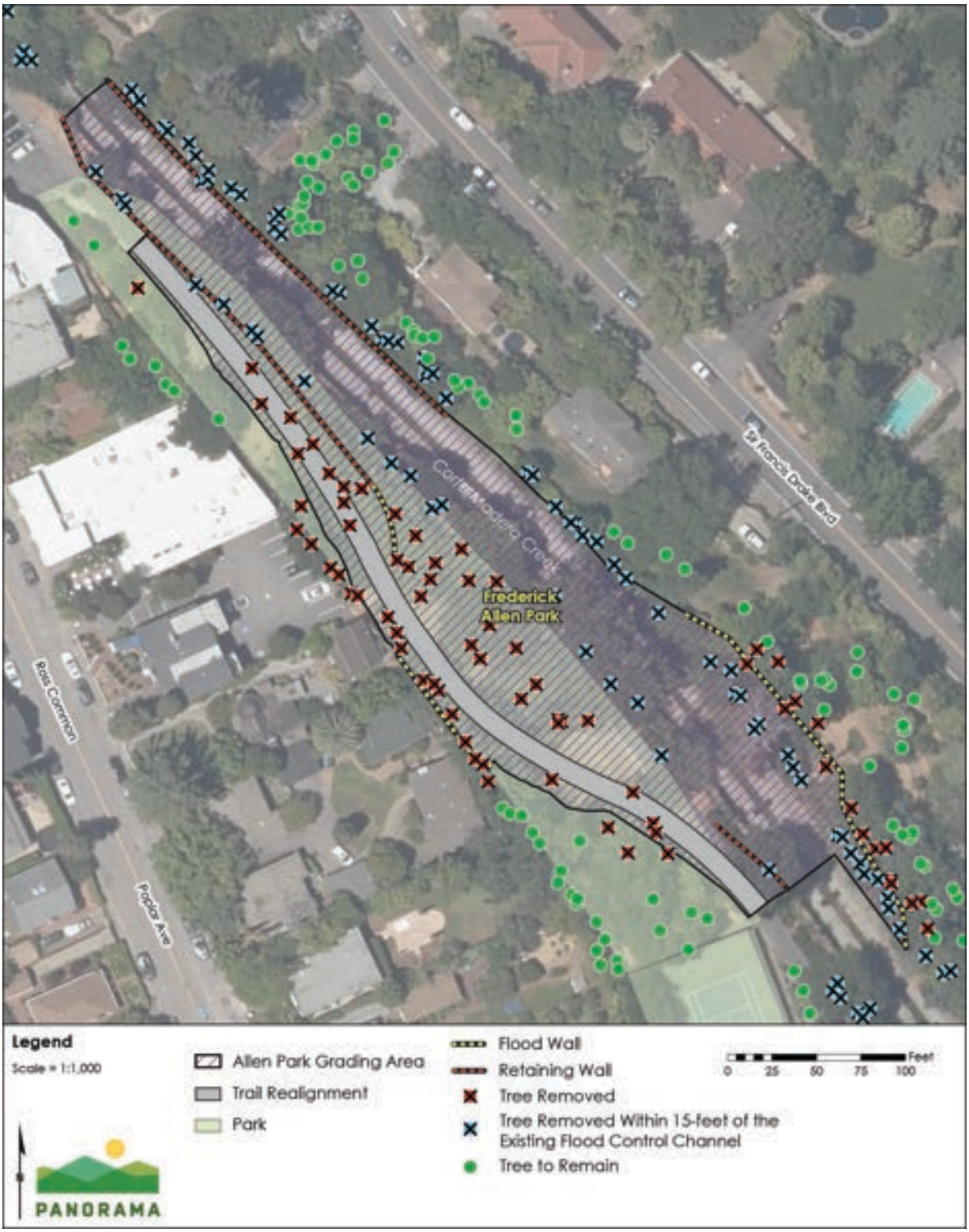
Notes

[a] Of the trees proposed for removal, 184 trees would need to be removed if the USACE requires a 15-foot setback from the existing channel including 18 trees from Unit 4, 71 trees from Frederick Allen Park, 88 trees from the floodwalls, 6 trees from the Stormwater pump station, and 1 tree from the Lower College of Marin concrete channel removal.

[b] 144 trees would need to be removed for Frederick Allen Park grading if the USACE requires a 15-foot setback from the new floodwalls. 113 trees would be removed if a setback is not required. It is the District's intention to apply for a variance to the 15-foot vegetation buffer along the floodwall, which will be approved at the discretion of the USACE.

Source: (GHD, 2020c)

Figure 2.6-2 Tree Removal Unit 4 and Frederick Allen Park



Sources: (GHD, 2020e; Golden Gate National Parks Conservancy, 2018)

Figure 2.6-3 Tree Removal Unit 3

Sources: (GHD, 2020e; Golden Gate National Parks Conservancy, 2018)

Figure 2.6-4 Tree Removal Unit 2

Sources: (GHD, 2020e; Golden Gate National Parks Conservancy, 2018)

Figure 2.6-5 Tree Removal Lower College of Marin Concrete Channel Removal Unit 2

Sources: (Golden Gate National Parks Conservancy, 2018; geomorphDESIGN, 2020c)

Following removal of vegetation from construction sites, temporary construction fencing would be installed to secure the site. Temporary construction fencing would consist of chain link or cyclone fencing or other similar fencing material. Any existing fence material that occurs in the work sites, such as along the top of the concrete channel wall, would be removed from the channel wall and hauled off site for disposal at a properly permitted landfill.

2.6.3 Diversion and Dewatering

Work within the creek channel would require creek diversion and fish rescue and relocation. Work within areas of shallow groundwater will require dewatering.

Channel Dewatering and Diversion

Dewatering of the channel can be accomplished either by dewatering the entire reach where work will be performed or localized dewatering at each work area. Dewatering of the entire reach can be accomplished by installing a temporary dam at the upstream end of the Unit 4 improvements and diverting the channel flow around the entire work area. The temporary dam would consist of sandbags or another structure with an impermeable outside lining. A screened pump or gravity intake pipe would be installed above the temporary dam and would be used to divert water around the work area in a flexible pipe that would discharge into the channel downstream of the work area and downstream dam. A similar technique can be used to provide localized dewatering by placing the temporary dam upstream of the work area and discharging the diverted water into the channel downstream of the work area.

There are several storm drain outfalls into the channel along the work area. These outfalls can be connected to the diversion pipe to bypass any discharge from them around the work area. Water that is discharged from the diversion pipe would flow in the channel until it reaches either a downstream tidal barrier dam or the Unit 2 work area. A temporary dam and pump would need to be installed upstream of the Unit 2 work area (upstream of the Tamalpais/Murphy culverts) to capture the diverted channel flow from upstream and pump it around the work area into the earthen channel downstream of the temporary sheet pile dam that will be in place to protect the Unit 2 work area from tidal inundation. If the Unit 2 construction is conducted after 2022, temporary sheet piling would not be installed in Unit 2 for the instream work in Unit 3. In the absence of a temporary sheet pile wall in Unit 2, a super sack[4] dam could be installed at the lower limits of instream work for the fish pool construction to restrict tidal influence from the work area. Access to construct the floodwalls in Unit 2 would be from land and would not require dewatering of the channel.

[4] Super sacks are large bags filled with sand or gravel that are used to construct a temporary cofferdam and dewater work areas.

The sheet pile wall for dewatering in lower Unit 2 will be installed using a silent piler[5]. A biologist with proper USFWS and CDFW qualifications and permits would be retained to monitor dewatering operations and channel being dewatered for the presence of aquatic species. If aquatic species are present, the biologist would relocate the species to a designated relocation area in accordance with federal and state permit requirements and approved Fish Capture and Relocation Plan. At a minimum, a block net would be installed at the upper end of the intertidal reach of the creek to allow for separation of freshwater fish from estuarine fish species. Fish would be relocated into appropriate habitat depending on their location at the time of capture.

Groundwater Dewatering

Groundwater dewatering would be completed using sumps for groundwater collection and submersible pumps within the sumps to pump the groundwater around the work areas. Temporary localized groundwater dewatering would be installed around the exterior portions of the excavated work area at the fish pools. A groundwater diversion box plate with walls made of fiberglass, steel, concrete, or other material would be installed to limit the groundwater in the work area to flow only through the exterior portions of the excavated area. Groundwater would be discharged into upland areas or storage tanks in accordance with federal and state water quality regulations and permit requirements.

2.6.4 Grading

Project construction would require grading within the Corte Madera Creek channel and Frederick Allen Park. Areas of channel lowering (Unit 4) and concrete channel removal would be excavated (cut). In addition to earthen fill in some locations, rock placement would be needed for channel stability and to protect utilities. A concrete apron or half-ton rock would be installed where the fish ladder would be removed in Unit 4, to stabilize sediment and soils. Concrete would be used for the short floodwalls, for retaining walls, and to seal the excavated fish pools. Excavation and fill quantities for each project element are identified in Table 2.6-3.

[5] A silent piler uses a hydraulic press to install piles into the ground using static energy in order to minimize noise and vibration.

Table 2.6-3 Estimated Cut and Fill Volumes

Unit	Element	Total Volume Cut Generated (cy)	Total Volume Fill - Native Soil (cy)	Total Volume Fill - Rock (cy)	Total Volume Fill - Concrete (cy)
Unit 4	Fish ladder removal and Unit 4 grading	1,500	750	450	225
Unit 3	Frederick Allen Park	8,900	1,350	0	650
	Fish pools	650	0	100	350
	Floodwall (segment #3)	420	160	80	180
	Stormwater pump station	2,800	1,400	20	110
	Floodwall (segment #2)	25	10	5	11
Unit 2	Floodwall (segment #1)	370	150	70	160
	Lower College of Marin concrete channel removal	7,250 [a]	0	1,025 [b]	0
	Total	**21,915**	**3,820**	**1,750**	**1,686**

Notes:

cy = cubic yard

[a] The volume of cut generated is the net cut and includes the volume of rock that would be used as fill.

[b] ,

[c] All rock that would be used in lower channel concrete removal currently occurs in the area and would be reused in the construction process.

Source: (GHD, 2020b; geomorphDESIGN, 2020c)

2.6.5 Floodwalls

Concrete floodwalls would be constructed using a cast-in-place method. The top of existing channel walls would be roughened using hydro-blasting where floodwalls would be constructed to extend the height of existing channel walls. Floodwall forms would be installed along the creek side of the channel using a catwalk along the channel wall. A bucket truck with a boom may also be used to install floodwall forms where vehicle access from across the channel is available via existing bicycle path. The forms, and catwalk if used, would be attached to the channel wall with temporary anchors drilled into the wall that would be removed and holes patched upon completion of the floodwall construction.

After the forms are installed on the creek side of the channel, rebar would be installed by drilling holes into the existing channel and inserting reinforced steel rods into the drilled holes. Forms would be completed by installing the form on the land side of the floodwall.

Concrete would be pumped into the forms using line pumps located at access points at each end of the floodwall. The concrete would be allowed to cure for five days prior to removing the

forms and inspection of the finished floodwall. The catwalk and any other temporary access infrastructure would be removed.

2.6.6 Fish Pools

To construct the fish pool, a rectangular portion of the channel approximately 3 feet wider and 3 feet longer than the overall proposed dimensions of the fish pool concept design (11 feet wide and 24 feet long) would be sawcut and demolished. The existing subgrade would be over-excavated and replaced with large diameter aggregate. An appropriate concrete mix design that allows for placement in a submerged environment to seal the work area would be placed in all areas between the sawcut concrete channel and the diversion box or other areas that experience hydraulic groundwater pressures. A base concrete layer would be placed to create a rectangular-shaped box with coated reinforcing steel to establish a working platform and sealed concrete joints with the existing sawcut concrete channel. The concrete surface would be finished with a very rough textured trowel finish to allow for another layer for finished concrete cap. The final concrete cap would be placed with contoured finish to meet the intended design geometry. The minimum concrete thickness would be three inches to avoid future spalling. Each fish pool would require 14 to 18 cubic yards of concrete. High-strength and long-life joint sealant would be installed to allow for thermal expansion but prevent groundwater intrusion or contamination with channel flows. Finally, the water diversion and pump would be removed and relocated to the next upstream fish pool to repeat this process for all fish pools constructed.

2.6.7 Streambed Stabilization

Some of the project elements require imported rip-rap material for channel stabilization. Existing on-site rip-rap would be used at Unit 2 and to the extent possible at Unit 4. Other channel stabilization measures would be installed in accordance with engineering specifications including planted rock, vegetated soil lifts, fabric, and engineered streambed material. Short cast-in-place concrete walls would also be installed adjacent to existing concrete walls in Unit 4.

2.6.8 Paving

The relocated and realigned pathway through Frederick Allen Park would be paved using aggregate base overtopped with asphalt concrete. Typical paving equipment would be used, including dump trucks, a paver, and compaction rollers to compact the aggregate base and asphalt. Access on the Frederick Allen Park pathway would reopen to the public after construction of the park has been completed.

2.6.9 Vegetation/Planting

All native riparian trees removed within the location of floodwalls and project components in upper Unit 2, Unit 3, and outside of Frederick Allen Park would be replaced within proximity to the removal location. A minimum of 89 trees and up to 125 trees would be planted within Frederick Allen Park. The exact number and location of trees would be determined during the USACE Section 408 review process. Trees would be located along the channel margin to provide shade over the channel after development of the tree canopy. A few mature trees would be planted along the walkway in Frederick Allen Park to provide shade during the

vegetation establishment period. Areas of temporary construction containing grasses and bushes would be reseeded with a native seed mix.

Trees would be removed within lower Unit 2 (downstream of Stadium Way) in order to restore tidal wetland habitat. Trees would be planted in an upland area near the new College of Marin maintenance and operations building. The proposed tree planting areas was previously a baseball field and is now completely bare.

A list of tree species that would be planted within Frederick Allen Park and the lower College of Marin concrete channel removal project area is provided in Table 2.6-4. A planting plan including proposed shrubs and understory vegetation is provided in Appendix B.

Table 2.6-4 Tree Planting List

Common Name	Species Name	Size
Frederick Allen Park		
Big leaf maple	*Acer macrophyllum*	15 gallons
Box elder	*Acer negundo*	15 gallons
White alder	*Alnus rhombifolia*	15 gallons
Western flowering dogwood	*Cornus nuttallii*	8-foot trunk height
Red twig dogwood	*Cornus sericea*	5 gallons
Pacific ninebark	*Physocarpus capitatus*	5 gallons
Coast live oak	*Quercus agrifolia*	36-inch box[a]
Valley oak	*Quercus lobata*	24-inch box[a]
Coyote willow	*Salix exigua*	Stakes
Pacific willow	*Salix lasiandra*	1 gallon
Arroyo willow	*Salix lasiolepis*	Stakes
Sitka willow	*Salix sitchensis*	Stakes
Bay laurel	*Umbellularia californica*	8-foot trunk height
Lower College of Marin Concrete Channel Removal		
Box elder	*Acer negundo*	Treepot 4 [a,b]
Buckeye	*Aesculus californicus*	Treepot 4 [a,b]
Coast live oak	*Quercus agrifolia*	Treepot 4 [a,b]
Valley oak	*Quercus lobata*	Treepot 4 [a,b]
Arroyo willow	*Salix lasiolepis*	Cutting

[a] A 36-inch box tree would be approximately 10 to 20 feet in height and a 24-inch box tree would be approximately 8 to 15 feet height

[a,b] The sizes indicated are minimum size requirements. Treepot 4 is a 4-inch square by 14-inch-deep pot.

Sources: (Prunuske Chatham, Inc., 2020; GHD , 2020i)

2.6.10 Workforce and Equipment

Construction is anticipated to start in April 2022 and would last approximately seven months. The in-channel construction would occur between June 15 and October 15. General construction timeframes and crew size estimated for project implementation are shown in Table 2.6-5. Construction activities would occur on weekdays between the hours of 8:00 a.m. and 5:00 p.m. No nighttime construction activities would occur as part of the project.

Table 2.6-5 Construction Schedule

Unit	Project Element	Estimated Construction Duration and Timing [a]	Estimated Construction Crew Size per Day
Unit 4	Fish ladder removal and Unit 4 grading	55 days; June – August 2022	8
Unit 3	Frederick Allen Park	105 days; June – October 2022	10
	Fish pools	85 days; June – October 2022	8
	Floodwall (segment #3)	75 days; April – July 2022	10
	Stormwater pump station	40 days; April – May 2022	10
	Floodwall (segment #2)	35 days; July – August 2022	10
Unit 2	Floodwall (segment #1)	70 days; April – July 2022	10
	Lower College of Marin concrete channel removal	72 days; August – October [a] December [b] 2022	10

Notes:

[a] Construction durations include planting activities.

[b] Work for the lower College of Marin concrete removal prior to September 1 would be conducted with hand tools only; heavy equipment use would start after September 1 to avoid the Ridgway's rail breeding season.

Source: (GHD, 2020b)

Equipment usage would depend on the individual needs of each project element as well as the discretion of individual contractors. The following presents a list of equipment types that would likely be used during implementation of the project.

- Boom truck/cherry picker
- Baker tanks (for water storage)
- Concrete truck and boom pump
- Concrete saw
- Crane
- Dump trucks
- Drill
- Excavator (small and medium)
- Flatbed trucks
- Generators and air compressors
- Grader
- Jackhammer
- Loader
- Pickup trucks (small and large)
- Pump
- Roller/compactor
- Paver
- Silent piler

2.6.11 Construction Access

Sir Francis Drake Boulevard would provide the main access from U.S. Highway 101 to all of the project work areas. Access along Corte Madera Creek would be provided via existing roads and recreation paths, including the Corte Madera Creek Pathway. An existing Flood Control District easement would be used to access the concrete channel removal area in lower Unit 2. Proposed project access routes are shown on Figure 2.6-6. Construction of the project would involve the temporary closure of Frederick Allen Park, including the bicycle and pedestrian path through

Frederick Allen Park, for up to seven months. Where the pathway is closed within Frederick Allen Park, a detour would be established to divert bicyclists onto Kent/Poplar Avenue from the College of Marin parking lot to Ross Common. The tennis courts and pedestrian access to the tennis courts at Frederick Allen Park would remain open throughout the duration of construction. Access along Bike Route 20 through Frederick Allen Park would be restored to the realigned pathway once construction of Frederick Allen Park is complete.

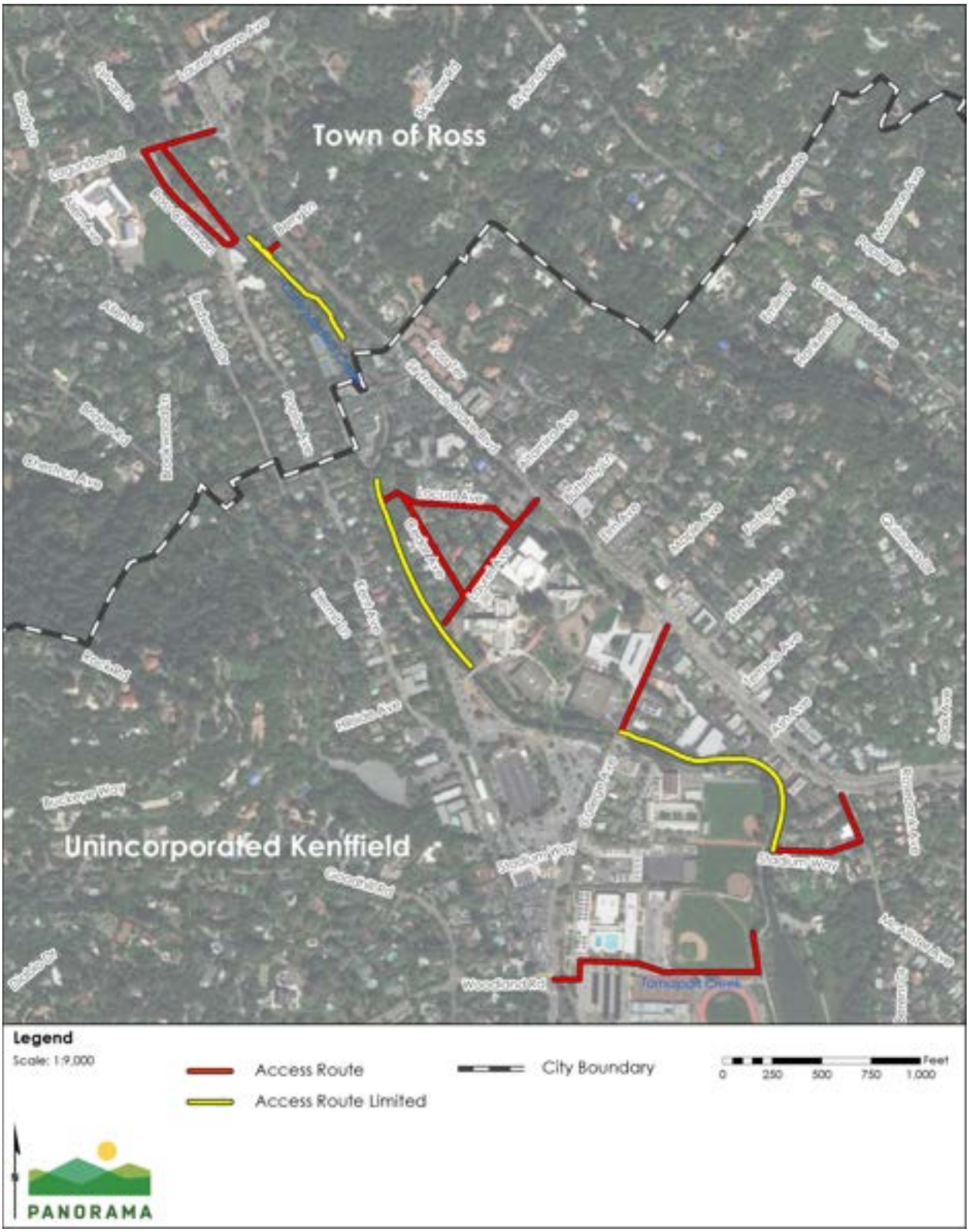
Construction activities could result in temporary lane closure on College Avenue during installation of dewatering infrastructure. Temporary lane closure on College Avenue would last one day each during installation and removal of the cofferdam (two days total). The end of Laurel Avenue, south of Cedar Avenue, may be closed for up to one month during construction of the stormwater pump station.

A new permanent concrete access ramp to the Corte Madera Creek flood control channel is planned for completion in 2021 as a separate project. The ramp would be located within the District's property, at the intersection of Locust Avenue and Cedar Avenue. With the timing of ramp completion scheduled in 2021, it is expected the ramp would be available for vehicular and equipment access into the channel for project construction in 2022 and for future Corte Madera Creek maintenance. The access ramp is not a part of the project, but is discussed in more detail in Section 4.0 Growth-Inducing and Cumulative Effects.

2.6.12 Material Hauling and Vehicle Trips

Table 2.6-6 identifies the truck trips associated with project construction. It is expected that all of the project elements will generate a net excess of excavated material resulting in export from the site for each element. Demolition and total project earthwork would generate approximately 27,000 cubic yards of demolition debris and soil. Of the 22,300 cubic yards of soil that is excavated, approximately 3,800 cubic yards may be beneficially reused in the project as fill material. The excess excavated soil materials (18,500 cubic yards) would be removed from the site. The demolition debris and soil, including the concrete, is anticipated to be recycled at the Marin Resource Recovery Center. After demolition and excavation, materials would be delivered to the project area using dump trucks. Some of the project elements require imported rip-rap material for channel stabilization. Existing on-site riprap will be re-used at Unit 2 and to the extent possible at Unit 4. Imported rip-rap will also be necessary, and potential sources include the following: Lunny Quarry in Nicasio, San Rafael Rock Quarry in San Rafael, Stony Point Quarry in Petaluma, and Syar Quarry in Napa.

Figure 2.6-6 Project Access



Source: (GHD, 2020f)

Table 2.6-6 Project Truck Trip Estimates

Unit	Project Element	Total One-Way Truck Trips	Average Daily One-Way Truck Trips
Unit 4	Fish ladder removal and Unit 4 grading	346	7
Unit 3	Frederick Allen Park	2,002	24
	Fish pools	364	5
	Floodwall (segment #3)	188	3
	Stormwater pump station	290	8
	Floodwall (segment #2)	36	1
Unit 2	Floodwall (segment #1)	170	3
	Lower College of Marin channel concrete removal	1,288	33
	Total	**4,684**	--

Source: (GHD, 2020b)

Fish pool construction and activities at Frederick Allen Park would generate the greatest number of medium- and heavy-duty truck trips of all phases, with up to 93 one-way trips per day. Several phases have overlapping construction time periods that could result in a higher number of peak daily truck trips of up to approximately 417 one-way trips accessing the project area but would average around 28 one-way truck trips throughout the construction period. In addition, worker travel to and from the construction site would account for an average of 18 one-way light vehicle trips per day, with the number of worker trips estimated on the assumption that each worker travels to the project site in their own vehicle. Accounting for overlap of phases, peak one-way worker trips could be up to 92 per day.

2.6.13 Construction Water

Project construction would require water for the purpose of dust control and soil stabilization. Water trucks would apply water to the site as necessary to control dust. Table 2.7-1 identifies the anticipated amount of water that would be required during construction of each project element.

2.7 Project Operation and Maintenance

2.7.1 Operation

The stormwater pump station is the only operable project element that would be installed as part of the project. The stormwater pump station would operate during storm events and would normally be powered through an electrical connection to the grid. A 150-kW generator would provide backup power in the case of electrical failure. Testing and maintenance of the backup generator would occur for up to 50 hours annually.

Table 2.7-1 Construction Water Requirements

Unit	Element	Required Water (gallons)
Unit 4	Fish ladder removal and Unit 4 grading	36,398
Unit 3	Frederick Allen Park	311,982
	Fish pools	12,999
	Floodwall (segment #3)	6,760
	Stormwater pump station	1,976
	Floodwall (segment #2)	203
Unit 2	Floodwall (segment #1)	2,964
	Lower College of Marin channel concrete removal	269,085
	Total	**642,366**

Source: (GHD, 2020b)

2.7.2 Maintenance

Once constructed, the project would require ongoing maintenance activities. Maintenance would be similar to existing District maintenance on Corte Madera Creek; however, the newly constructed habitat would require additional landscape maintenance and vegetation management during the establishment period. Maintenance activities would include the following:

1. Vegetation management
2. Sediment and debris removal
3. Stormwater pump station maintenance
4. Annual floodwall and structure inspection and maintenance

Most maintenance activities would occur during the dry season from April 15 to October 15. The Town of Ross would need to grant an easement to the District for maintenance of project elements on Town property, specifically in Frederick Allen Park. As a part of the easement approval process, the District would enter into a maintenance agreement with the Town of Ross that would specify the District's and Town's responsibilities for maintenance of project elements in Frederick Allen Park.

Vegetation Management

Vegetation-management activities are employed to achieve three main goals:

1. Maintain channel flow capacity.
2. Reduce fire fuels.
3. Restore creek habitat by removing invasive nonnative plants and revegetating with native plants.

Vegetation management activities would not include ground-disturbing activities. These activities employ vegetation control methods such as cutting and removing invasive vegetation above the ground by hand or with loppers, hand saws, chainsaws, pole saws, weed eaters, and other hand tools. Removal of nonnative vegetation, tree removal, and thinning employ a mix of tools including chainsaws, loppers, hand saws, pole saws, hedge trimmers, and other hand tools. Vegetation management also would include maintenance of replacement trees planted in Frederick Allen Park, including monitoring the establishment of trees after planting.

Lower College of Marin Concrete Channel Removal

The lower College of Marin concrete channel removal and restoration is being designed to be a natural, self-maintaining creek ecosystem, resilient to sea-level rise and climate change. No routine maintenance is anticipated. In the event unforeseen maintenance is required, such as to address storm flow debris, washed up boats, or other man-made debris in the area that affects the natural function of the habitat or flood conveyance capacity, the District would remove the debris.

Sediment and Debris Removal from Fish Pools

Timely removal of debris from fish pools is necessary to avoid or minimize any delay in fish migration that would typically be associated with rainfall-runoff events. Debris (woody debris or urban debris) within the fish pools would be removed by a hand crew if it were large enough to be disrupting flow patterns within the pool in such a way that could reduce resting areas or cause sedimentation. It is anticipated that debris removal would occur approximately once per year but could be more frequent depending on observed conditions. Debris removal would take place as soon as flows recede to a safe level between storm events.

Accumulated sediment would also be removed from the fish pools if the amount of sediment is affecting their intended functioning. Sediment would be removed using a Vactor truck that would access the channel via the permanent access ramp scheduled for completion in 2021. Alternatively, sediment could be removed by a hand crew. Sediment removal would occur on an as-needed basis.

Stormwater Pump Station

During the dry season, the pump station would be inspected once a month. Routine maintenance would be performed annually on the motors and generator. Debris collected in the wet well and outlet structure would be removed, and the facilities would be cleaned with a Vactor truck at least once every wet season. Annual tests would be conducted on the electrical and mechanical systems. Load bank tests would be performed on the generators every three years, and periodic maintenance would be performed on the pump systems every six years.

Floodwall Inspections and Maintenance

Floodwalls would be maintained in accordance with the USACE Interim Operation and Maintenance Manual for Units 1 through 3. Visual floodwall inspections would be conducted just before the beginning of the flood season, immediately after each major high-water period, and at intervals not exceeding 90 days. In addition, inspections are to be made after every earthquake that occurs within 200 miles and has a Richter magnitude of 5 or above. Inspections

would also be required after smaller earthquakes if specific reports of damage are received. Eroded concrete would be repaired when reinforcing steel is exposed or erosion approaches 2 inches in depth. Normally, eroded concrete is repaired by sandblasting the eroded area and filling with Portland cement mortar. The channel walls would be maintained and cleaned as necessary, removing all barnacles and any other matter that may deteriorate the channel.

2.8 Permits and Approvals

The project will require permits and approvals from federal, state and local agencies. The anticipated permits and approvals needed for implementation of the project are listed in Table 2.8-1.

Table 2.8-1 Required Permits or Approvals for the Project

Agency	Approval or Permit
Federal	
U.S. Army Corps of Engineers	Clean Water Act Section 404 Permits Clean Water Act Section 408 Permit
U.S. Fish and Wildlife Service	Section 7 Consultation
National Marine Fisheries Service	Endangered Species Act (ESA) Section 7 Biological Opinion
Federal Emergency Management Agency	Conditional Letter of Map Revision
State	
State Office of Historic Preservation	National Historic Preservation Act Section 106 Consultation
California Department of Fish and Wildlife	Fish and Game Code Section 1602 Lake and Streambed Alteration Agreement
San Francisco Bay Regional Water Quality Control Board	NPDES Construction Stormwater Permit Clean Water Act Section 401 Water Quality Certification
State Lands Commission	Lease agreement for work within State Lands jurisdiction
Local	
Marin County Flood Control and Water Conservation District	Lead local agency (CEQA)
Town of Ross	Tree permit Easement and MOU for construction and maintenance within Frederick Allen Park (Town of Ross property) Design review
College of Marin	Potential easement modification for work within College of Marin property

2.9 Distinction Between Review of Environmental Issues and Project Merits

Often during review of an EIR, the public raises issues that relate to the attributes or wisdom of the project or issues such as the project's community benefits or community consequences (referred to here as "project merits") rather than the scope or substance of the environmental analyses in the EIR. Lead Agency review of environmental issues and project merits are both important in the decision of what action to take on a project, and both are considered in the decision-making process for a project. However, a Lead Agency in its CEQA review is required only to address environmental issues that are raised. Certifying an EIR (i.e., finding that it was completed in compliance with CEQA) and taking action on the project are procedurally distinct processes and result in separate decisions made by the Lead Agency. Nonetheless, the EIR must be certified by the Lead Agency before the Lead Agency can take approval actions on the project.

2.10 References

Bay Area Open Space Council. (2011, May). Bay Area Cities GIS dataset. *San Francisco Bay Area Upland Habitat Goals Project*. GreenInfo Network.

geomorphDESIGN. (2020a, May 27). Unit 4 - Corte Madera Creek Long Profile.

geomorphDESIGN. (2020b, May 6). Corte Madera Creek Lower College of Marin Reach Concrete Channel Removal Project 30% Design Plans.

geomorphDESIGN. (2020c, November 23). Lower College of Marin Corte Madera Creek Restoration Project 65% Design Plans.

GHD . (2020i, September 29). Allen Park Preliminary Planting Plan.

GHD. (2019, October). Marin County Flood Control Granton Park Preliminary Storm Water Pump Station Wet Well Plan.

GHD. (2020a, August 28). Project Component Maps - CAD - 08282020.

GHD. (2020b, September 1). Overall Construction Memo Tables 2020-09-01.

GHD. (2020c, July 6). Overall Construction Considerations Memo.

GHD. (2020d, August 28). Temporary Work Area Maps - CAD - 08282020.

GHD. (2020e, August 28). Tree Removal Analysis - GIS - 20200828.

GHD. (2020f, August 28). Construction Access Maps - CAD - 08282020.

GHD. (2020g, September 8). Corte Madera Creek Fish Passage Overall Site Plan.

GHD. (2020h). Project Elements for the Corte Madera Creek Flood Control Project GIS dataset.

Golden Gate National Parks Conservancy. (2018, June). Orthoimagery of the Marin County Imagery Study Area. *Marin_County_Mosaic.sid*.

Marin County. (2012). *Marin County Local Hazard Mitigation Plan 2012 Update.* Retrieved from https://www.marinsheriff.org/assets/downloads/LHMP_2012update_withResolution.pdf

Marin County Flood Control and Water Conservation District. (2020). *Ross Valley Flood Protection & Watershed Program - Zone 9 Program*. Retrieved July 16, 2020, from https://www.marinwatersheds.org/creeks-watersheds/ross-valley-flood-protection-watershed-program/zone-9-program-history

Mike Love & Associates and Jeff Anderson & Associates. (2007). *Alternative 1 Fish Resting Pool.* Friends of Corte Madera Creek.

Prunuske Chatham, Inc. (2020, May). Proposed Revegetation Plan for Lower Corte Madera Creek Concrete Channel Removal Project.

Stetson Engineers, Inc. (2011). *Capital Improvement Plan Study for Flood Damage Reduction and Creek Management in Flodo Zone 9/Ross Valley.* Marin County Flood Control and Water Conservation District, Flood Zone 9.

Stetson Engineers, Inc. (2020, February). Ross Valley Sanitary District - Civil Plans.

Tele Atlas North America, Inc. (2019). U.S. and Canada Detailed Streets GIS dataset. *ESRI® Data & Maps: StreetMap™*. ESRI.

Tele Atlas North America, Inc. (2020). U.S. and Canada Detailed Streets GIS dataset. *ESRI® Data & Maps: StreetMap™*. ESRI.

U.S. Geological Survey. (2013). USGS NED 1/3 Arc Second DEM Raster dataset.

U.S. Geological Survey. (2016). National Hydrography Dataset Waterbodies GIS dataset.

USGS. (2019). National Hydrography Dataset.

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3 Environmental Setting, Impacts, and Mitigation Measures

3.0 Introduction

3.0.1 Scope of Analysis

This chapter contains an analysis of the environmental topics identified by the District's scoping process for the Environmental Impact Report (EIR) (Notice of Preparation [NOP] and Scoping Meetings) described in Chapter 1. Environmental topics addressed in this chapter include:

- Aesthetics and Visual Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Public Services
- Recreation
- Transportation and Circulation
- Tribal Cultural Resources
- Utilities and Service Systems
- Agriculture and Forestry Resources, Land Use and Planning, Mineral Resources, Population and Housing, Socioeconomics, and Wildfire

Sections 3.1 through 3.16 of this chapter describe existing environmental conditions as they relate to each specific topic, identify significant adverse environmental effects (significant impacts) from implementing the project, and present mitigation measures to avoid or substantially lessen significant impacts to a less-than-significant level. Growth-inducing and cumulative impacts are discussed in Chapter 4. Alternatives to the project are described and analyzed, and their impacts compared to those of the project in Chapter 5.

3.0.2 Format of Environmental Analysis

Sections 3.1 through 3.16 of this chapter are organized as described below, based on the requirements of California Environmental Quality Act (CEQA).

Scoping Comments

Scoping comments received during the public scoping period for the EIR are included for each applicable resource section. Each comment, along with the location where each comment is addressed in the respective resource analysis, is summarized in a table. If scoping comments are not applicable to the resource topic, it is stated that no scoping comments apply.

Environmental and Regulatory Setting

Existing conditions are described in the respective "setting" sections for each environmental resource topic. The existing baseline conditions are described as of the date the NOP was published. These descriptions summarize information compiled during the study process to prepare the EIR. In the case of Hydrology, a future condition is also considered because changes to the hydrologic setting would occur prior to project construction and implementation as a result of upstream flood-control projects that have been approved but have not yet been constructed. Future changes in the hydrologic setting would also result from sea level rise. Background materials used in the EIR are referenced at the end of each section. The setting includes both the physical setting and the regulatory setting (that is, applicable local, State, and federal laws and regulations) that pertain to each resource topic.

Impact Assessment Methodology

Significance Criteria

Each resource topic in this EIR includes a definition of the significance criteria used to perform the analysis. This EIR uses the significance criteria adopted from the latest Appendix G of the CEQA Guidelines. The CEQA Guidelines significance criteria are supplemented with local thresholds of significance from Appendices K and N of the Marin County's Environmental Impact Review Guidelines. In each instance, the discussion cites the source of the identified threshold. The significance threshold used in this EIR account for amendments to CEQA Guidelines Appendix G, as adopted by the California Natural Resources Agency on December 28, 2018.

Approach to Analysis

This section describes any methodologies used to prepare the impact assessment, including modeling or standards utilized to assess impacts where specific technical methods were applied.

Impact Discussion

Impacts

The analysis under each impact statement includes an evaluation of the significance of environmental impacts resulting from construction, operation, and maintenance of the project. An impact conclusion is provided for the analysis of each criteria question. The analysis considers both short-term and long-term impacts as well as direct and indirect impacts resulting from the project. Indirect impacts from a project may occur later in time, at a different location, or as the result of a sequence of related interactions (State CEQA Guidelines Section 15064[d][2] and [3]).

Levels of Significance and Significance Determination

The following are definitions of the impact determinations used in the impact discussion:

- **Significant and Unavoidable.** This determination applies if the project would result in an adverse effect that would exceed the significance criteria and for which

there is no feasible mitigation available to reduce the impact to a less-than-significant level.

- **Less than Significant with Mitigation.** This determination applies if there is a potential for the project to result in an adverse effect that would meet or exceed the significance criteria, but feasible mitigation is available that would reduce the impact to a less-than-significant level.
- **Less than Significant.** This determination applies if there is a potential for some limited impact but not a substantial, adverse effect that qualifies under the significance criteria as a significant impact. No mitigation is required for impacts determined to be less than significant.
- **No Impact.** An impact issue is considered not applicable (no impact) if there is no potential for impacts or the environmental resource does not occur within the project area or the area of potential effect.

Mitigation Measures

Each impact subsection identifies mitigation measures for all of the impacts considered significant, consistent with CEQA Guidelines Section 15126.4, which states that an EIR "shall describe feasible measures which could minimize significant adverse impacts…." In this EIR, mitigation measures are identified (where feasible) for all of the significant impacts, and residual effects after mitigation are noted. If additional impacts could result from implementation of a mitigation measure, those impacts are identified, consistent with CEQA Guidelines Section 15126.4.[1]

3.0.3 Approach to Cumulative Impact Analysis

Cumulative impacts, as defined in CEQA Guidelines Section 15355, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of each project when added to those of other closely related past, present, or probable future projects.

CEQA Guidelines Section 15130(b) presents two approaches for analyzing cumulative impacts:

- A list of past, present, and probable future projects producing related or cumulative impacts, including those projects outside the control of the agency; or
- A summary of projections contained in an adopted local, regional, or statewide plan or related planning document that describes or evaluates conditions contributing to the cumulative effect. Such plans may include a general plan, regional transportation plan, or plans for the reduction of GHG emissions. A

[1] CEQA Guidelines Section 15126.4 states that "if a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed but in less detail than the significant effects of the project as proposed."

summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program.

The cumulative impact analysis considers the effects of the project together with those of other past, present, or probable future projects within the geographic scope of cumulative analysis applicable to each resource topic. Refer to Section 4.3 Cumulative Impacts for a more detailed description of the approach to the cumulative impact analysis found in this EIR.

3.1 Aesthetics and Visual Resources

3.1.1 Introduction

This section includes an evaluation of the potential for the project to adversely impact aesthetic and visual resources in the project area. This section provides an overview of the environmental and regulatory setting that applies to aesthetic and visual resources within the project area and includes a discussion of project impacts and appropriate mitigation measures, where necessary. The aesthetic and visual resources setting and impact analysis are based on field observations, aerial and ground-level photographs, and visual simulations.

3.1.2 Scoping Comments

Comments related to aesthetic or visual impacts were received during the public scoping process. These comments and the location where they are addressed in the aesthetics and visual resources analysis are provided in Table 3.1-1.

Table 3.1-1 Aesthetics and Visual Resources Scoping Comments

Agency/Entity	Comment	Location in Aesthetics and Visual Resources Section that Comment is Addressed
Garril Page	Ross' essence and character are defined by the high canopy of its majestic heritage trees. The proposed Frederick Allen Park (FAP) Riparian Corridor as proposed is barren, stark, denuded of natural beauty, and very inhospitable. The proposed man-made shade structures are not in keeping with any aspect of the town and appear to be poor substitutes for the trees that would be removed. The shade structures provide relatively little shade for humans, none for fish in the basin, and are not appropriate, welcoming, nor attractive to gaze upon.	Section 3.1.6, Impact 3.1-2
Garril Page	Tree loss creates emphasizes the proximity of Sir Francis Drakes traffic. This becomes visual pollution for Ross Common. The intrusion will be particularly notable within the proposed FAP Riparian Corridor.	Section 3.1.6, Impact 3.1-2
Julie McMillan	If Frederick Allen Park is used as a flood plain, many trees will be removed, will be bad aesthetically and expensive to add replacement trees	Section 3.1.6, Impact 3.1-2
Charles Goodman	The County must address the removal of over 200 mature trees and how it plans to replace the Park Setting, Privacy, and Habitat Coverage in a timely manner.	Section 3.1.6, Impact 3.1-2

3.1.3 Aesthetic and Visual Concepts

Baseline aesthetic conditions are defined within the context of visual quality and visual sensitivity. For the purpose of this EIR, visual quality and visual sensitivity were defined consistent with the Federal Highway Administration (FHWA) Guidelines for the Visual Impact Assessment of Highway Projects ((Federal Highway Administration, 2015). While the project is not a highway project, the FHWA guidance was used to evaluate overall baseline visual quality in the project area because Marin County has not developed their own guidance for evaluating visual quality and the FHWA guidance was developed to address visual impacts in urban environments, similar to the visual environment of the proposed project. The Town of Ross's design review criteria and standards (Section 18.41.100 of the Town of Ross Municipal Code) would be addressed during the Town of Ross design review process.

Visual Quality

The baseline visual quality of a scene is used to evaluate the degree of visual change and impact. A viewer observing an existing scene has a range of available responses that are inherent to all human beings. The FHWA guidelines recognize three types of visual perception that are used in defining visual quality:

- **Harmony.** When viewing the components of a scene's natural environment, viewers inherently evaluate the natural harmony of the existing scene, determining if the composition is harmonious or inharmonious.
- **Cultural Order.** When viewing the components of the cultural environment, viewers evaluate the scene's cultural order, determining if the composition is orderly or disorderly.
- **Coherence.** When viewing the project environment, viewers evaluate the coherence of the project components, determining if the project's composition is coherent or incoherent.

Viewers have a concept of what constitutes natural harmony, cultural order, and project coherence. The greater degree to which the visual resources of the project meet the viewer's preference concept of natural harmony, cultural order, and project coherence, the higher value the viewer places on those visual resources. The existing visual quality was evaluated as low, moderate, or high, using the criteria of natural harmony, cultural order, and project coherence.

Visual Sensitivity

Visual sensitivity is how concerned viewers are about visual quality. Several factors influence visual sensitivity, including viewer quantity, viewer activity, and distance between project activities and viewers. Viewer sensitivity is higher in areas that are resting points and areas with higher numbers of viewers (e.g., Frederick Allen Park and Bike Route 20) than viewer sensitivity in areas that are viewed less frequently (e.g., Corte Madera Creek along Unit 4).

Factors that influence visual sensitivity include:

- **Degree to which change is apparent in the landscape:** Certain landscapes are naturally more able to undergo changes without the changes being noticeable. A

dense forest may, for example, mask aesthetic changes that take place deep in the forest.

- **Proximity:** The further away a scene or object is from a viewer, the less exposure that viewer has-or conversely, the closer the viewer is to an object or scene, the more exposure the viewer has. Changes in the view are more perceptible and more sensitive at closer distances. Proximity is measured in the following distance zones (Litton, 1968):
  - **Foreground:** Up to 0.5 mile from the viewer
  - **Middleground:** Extends from the foreground zone to approximately 3 to 5 miles from the viewer
  - **Background:** Extends from the middleground zone to the limit of visibility
- **Viewer attention:** Activities that are within the viewer's focus are more apparent than those that are outside of or at the edge of a viewer's focus.
- **Extent:** Refers to the number of people that will be viewing the scene or object. Fewer viewers means less exposure; many viewers means greater exposure. Areas with greater numbers of viewers will be more sensitive to change than areas with fewer viewers.
- **Duration**: Measures how long viewers view the scene or object. The narrower the view and the faster one travels, the shorter the duration. The wider the view and the more one lingers, the longer the duration and the more viewer exposure. The shorter the duration of view, the less sensitive the viewer is to change.

3.1.4 Environmental Setting

Regional Setting

The project is in central Marin County, which is part of the larger San Francisco Bay Area (Bay Area). The San Francisco Bay region is in the Coast Ranges Physiographic Province, which spans 400 miles in California from Humboldt County to Santa Barbara County. The Bay Area is characterized as having a Mediterranean climate, with Coast Redwood forest and chaparral and woodlands. The Bay Area is highly developed; however, substantial tracts of open space contribute to the visual character of the region.

Marin County has a unique visual environment with a diversity of landscapes that includes views of open space, ocean vistas and beaches, San Francisco Bay shoreline, hills and ridgelines, agricultural lands, stands of forests, and other natural features. The majority of the undeveloped land is found in the northern and western areas of the county. Nearly half of the county's land is protected by park or open-space status. In the southern portion of the county, long-distance views are often dominated by Mount Tamalpais.

Urban development in Marin County is essentially concentrated along the U.S. Highway 101 corridor in the eastern third of the county from Novato in the north, San Rafael in the central portion, and Sausalito/Marin City in the south, punctuated by the Golden Gate Bridge at its southern tip. Aside from the larger cities of San Rafael and Novato, urban development in Marin County is centered on well-established villages and towns in the many valleys on the

northern and eastern flanks of Mount Tamalpais. The project area is located in unincorporated Kentfield and the Town of Ross and within the City-Centered Corridor, along Highway 101, as identified in the Marin Countywide Plan. The corridor is primarily designated for urban development and for protection of environmental resources. The surrounding ridgetops and upper slopes of the watershed are generally wooded and undeveloped whereas the valley floor, where the project is located, is densely developed. The communities surrounding the project site have maintained a small town feel that blends with the surrounding natural and agricultural landscapes. Most of the smaller municipalities in Marin County have adopted land-use controls that encourage residential development near town centers, which lends to walkable neighborhoods, maintaining a pedestrian-scale community. As noted below, the Town of Ross has a particular visual character maintained by its own building-design requirements. County and local ordinances have also protected nearby ridgelines and scenic vistas.

Project Setting

Visual Character

The viewshed of the project area within Corte Madera Creek and Frederick Allen Park is limited to those areas immediately adjacent to Corte Madera Creek and within Frederick Allen Park. The Corte Madera Creek channel is set below grade. Residential development and dense vegetation and trees along College of Marin campus border the creek and block views of the subsurface flood control channel from areas northeast of the creek, with the exception of views from areas immediately adjacent to the creek and at creek overpasses. Bike Route 20 and residential development, Frederick Allen Park, commercial development, and a parking lot border Corte Madera Creek and the project area. Views of the project area from areas west of the creek are limited to Bike Route 20, areas within Frederick Allen Park, and the parking lot at the Town of Ross Post Office due to the density of surrounding residential and commercial development.

The viewshed of the areas surrounding the project area within the Town of Ross and Kentfield is framed by Southern Heights Ridge on the north and east, which physically and visually separates Ross Valley from San Rafael, while Mount Tamalpais forms the visually-defining ridge on the south and west of Ross Valley. Much of the land area on the Mount Tamalpais ridgeline is preserved as open space, as Marin County Open Space lands and the Marin Municipal Water District (MMWD) watershed lands. Ridgeland and upland greenbelt areas are located within the Town of Ross and Kentfield boundaries, and the Bald Hill Open Space Preserve and Baltimore Canyon Open Space Preserve are west of the Town of Ross and Kentfield areas, respectively. Corte Madera Creek parallels Sir Francis Drake Boulevard, and the creek flows south within the project area towards Corte Madera and the San Francisco Bay.

Representative photographs of the project area were taken to characterize the visual setting of Corte Madera Creek and the immediate surroundings. Representative photo locations are provided on Figure 3.1-1. Representative photos of the project area are shown on Figure 3.1-2 through Figure 3.1-10. Photos were taken on July 28, 2020, between 10 am and 12 pm. All photographs presented in this section have an approximately 40-degree horizontal angle of

view, which is roughly equivalent to a 35-millimeter film camera with a 50-millimeter lens. This configuration is intended to represent an approximate human field of vision and viewing scale. Photographs were taken at eye level.

Town of Ross (Units 4 and 3)

The Town of Ross is between the Town of San Anselmo to the north and the Kentfield to the south and is framed by generally continuous ridgelines to the north and south. The Town of Ross is a quiet residential community with tree-lined, shady streets with wooded ravines, open grassy areas, and long avenues of large shade trees. The Town's development pattern is similar to that of the other Ross Valley communities, with development on the valley floor and residential development extending up the adjacent hillsides.

Within Unit 4, Corte Madera Creek has natural channel characteristics with vegetated banks and a gravel streambed although many human-made features and disturbances are present. Structural elements include concrete bridge abutments and piers at Lagunitas Road Bridge. Bank-retaining structures, including rock gabions, railroad ties, sand concrete bags, and concrete current deflectors are present on the right bank upstream of Lagunitas Road Bridge and the left bank downstream of Lagunitas Road Bridge. Unit 4 has a relatively undisturbed appearance (compared to Units 3 and 2) characterized by predominantly native riparian vegetation and native material streambed. Trees form a dense canopy that couple with abundant understory vegetation to produce a calm and visually pleasing environment in the creek. The scenic integrity of this section of the creek is somewhat disrupted by the presence of Lagunitas Road Bridge, resident-constructed floodwalls and gabion structures, the Ross Town Hall upstream of the Lagunitas Road Bridge, and residences along the left bank between the bridge and fish ladder. Sylvan Lane runs parallel to the creek on the right bank upstream of Lagunitas Road Bridge. Sylvan Lane is quiet, narrow, wooded, and aesthetically pleasing.

Downstream of Lagunitas Road Bridge, bank stabilization and retaining structures are visible on the left bank below the upper bank terrace. The bank-retaining structures are visible from public areas, including public parking lots and Bike Route 20 on the top of the right bank. The bank retaining structures are not visible from the residences above the retaining structures.

Despite the presence of human modifications in Unit 4 of the creek, Unit 4 is regarded as having moderate visual quality due to moderate harmony, orderliness, and coherence along the natural creek channel. Views of the creek are easily accessible from Lagunitas Road Bridge, the Post Office, Ross Town Hall, Bike Route 20, and Frederick Allen Park along the right bank. Representative photographs were taken from areas within Unit 4 to demonstrate the visual conditions in the area. A representative photograph of Unit 4 is provided in Figure 3.1-2.

Upper Unit 3 within the Town of Ross is characterized by a trapezoidal concrete-lined drainage channel, extending downstream from the southern end of the Town of Ross Post Office parking lot adjacent to the existing fish ladder to the Kentfield Hospital. The concrete channel has vertical walls and a V-shaped channel bottom. The channel consists of long straight sections, several subtle bends, and three tight curves. Views of the creek in Unit 3 are dominated by the concrete-lined flood control channel and steel fencing that runs atop the walls of the channel.

These views are somewhat softened by vegetation growing along the tops of the channel walls that is quite dense in some locations, especially where the creek borders Frederick Allen Park. The visual quality of Unit 3, specifically north and south of Frederick Allen Park where nearby buildings and residences are visible and the vegetation along the creek and Bike Route 20 is dense, is low-moderate, and of lower visual quality compared to the more natural condition of Unit 4 upstream. Views along Unit 3 are less coherent than Unit 4 because there are intermittent views of vegetation along the fence line and views of the concrete floodwall. Unit 3 is less harmonious than Unit 4 because of the concrete elements of the floodwall and fencing, nearby residences, and adjacent vegetation that are inconsistent with a natural creek environment. Frederick Allen Park is located downstream of the Ross Post Office, adjacent to the creek. Bike Route 20, a bicycle-pedestrian path, travels through the park and along the right bank of the creek through Unit 3. The visual quality of Frederick Allen Park is considered moderate due to the dense vegetation that blocks views of adjacent residences, business, and other development. Vegetation and trees within Frederick Allen Park also soften views of the concrete channel, and the overall views have less human intrusion and are not as modified as the surrounding areas in Unit 3. Representative photographs of upper Unit 3 are provided in Figure 3.1-3 through Figure 3.1-6.

Kentfield Area (Units 3 and 2)

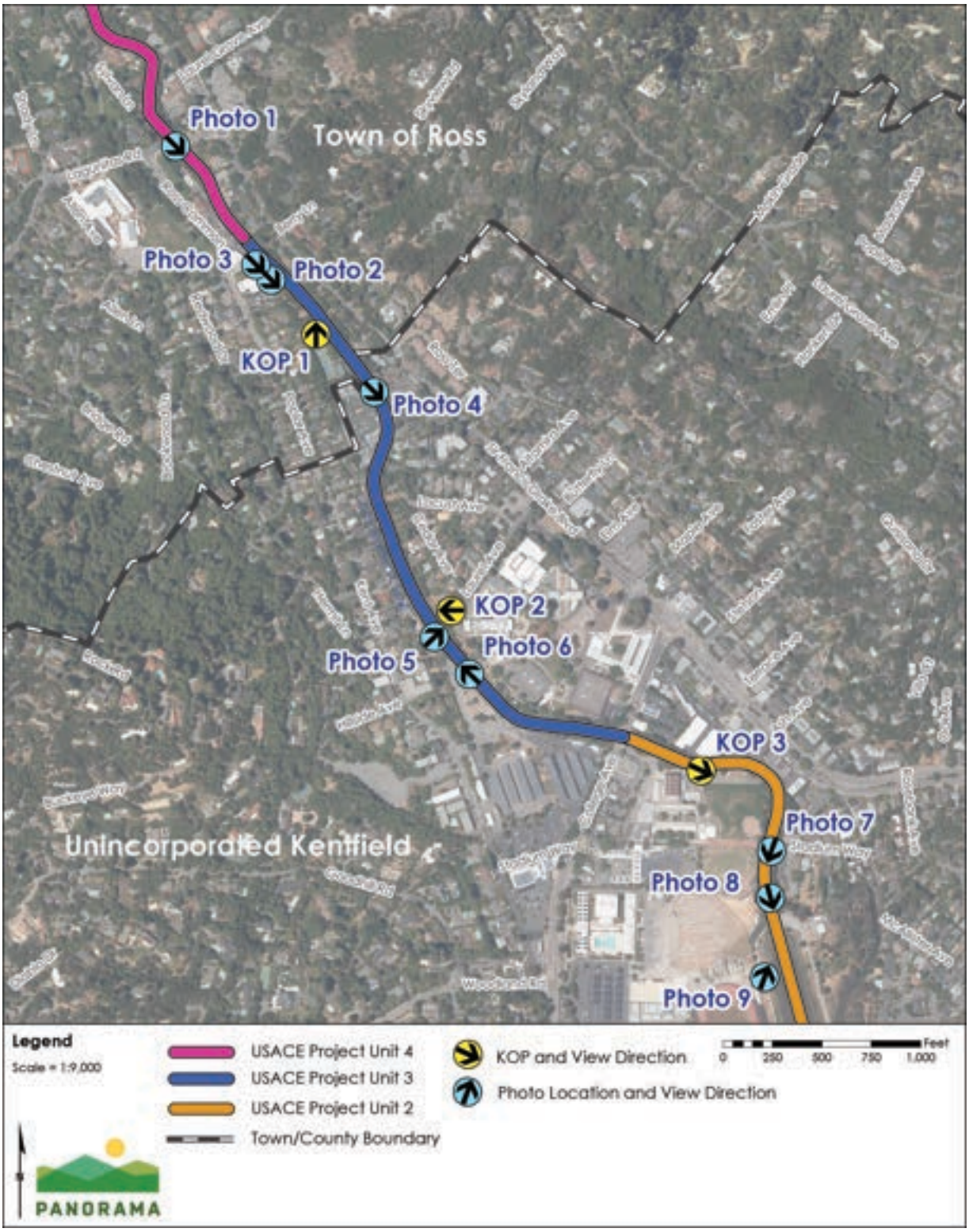
The community of Kentfield borders the Town of Ross to the south. In general, this area shares the same visual and aesthetic characteristics as the Town of Ross and neighboring municipalities. Kentfield shares a similar development pattern as the Town of Ross, with commercial and residential on the valley floor framed by County-designated ridgelines on the north and south.

Lower Unit 3 and Unit 2 within the Kentfield area share similar characteristics as upper Unit 3 within the Town of Ross. Unit 3 extends from Kentfield Hospital downstream to just south of Stadium Way ~~Avenue~~. Bike Route 20 continues through Kentfield adjacent to the right bank of the creek, eventually crossing to the left bank at the Stadium Way ~~Avenue~~ Bridge. An informal unnamed path (unnamed path #1) runs adjacent to the left bank of the creek, between Kentfield Hospital and Laurel Avenue in Unit 3, on the left bank between College Avenue and Stadium Way (unnamed path #2), and south of Stadium Way on the right bank (unnamed path #3) in Unit 2. The overall appearance of the creek in Units 3 and 2 is characterized as highly modified, with low visual quality and low scenic integrity. Representative photographs of lower Unit 3 and Unit 2 are provided in Figure 3.1-7 through Figure 3.1-10.

Scenic Vistas

The ridgelines encompassing the project area provide ample opportunity for scenic vistas from publicly accessible viewpoints into the Town of Ross and Kentfield. Though the development on the valley floor is visually obvious from the viewpoints on both ridges, the visual texture is softened by the relatively even cover of street trees and open space throughout the valley. This allows the visual appearance of the valley floor to gradually transition and blend in with the undeveloped ridgelines with no sharp or abrupt visual contrast. The appearance from publicly accessible viewpoints is visually consistent and lacking sharp visual contrast.

Figure 3.1-1 Representative Photograph and Key Observation Point Location Map



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, Golden Gate National Parks Conservancy 2018)

Figure 3.1-2 Photograph 1: View of Unit 4 from Lagunitas Road Bridge, Looking Southeast

Figure 3.1-3 Photograph 2: View of Unit 3, Frederick Allen Park, Looking Southeast

Figure 3.1-4 Photograph 3: View of Unit 3, Frederick Allen Park, Looking Southeast from Marin County Bicycle Route 20

Figure 3.1-5 Photograph 4: View of Upper Unit 3 Fish Pools from Kentfield Hospital Bridge, Looking Southeast

Figure 3.1-6 Photograph 5: View of Unit 3 From Marin County Bicycle Route 20, Looking Northeast at Proposed Pumping Station Location

Figure 3.1-7 Photograph 6: View of Lower Unit 3 from Science-Math-Nursing Building Bridge, Looking Northwest

Figure 3.1-8 Photograph 7: View of Unit 2 from Marin County Bicycle Route 20 near Stadium Way Bridge, Looking South

Figure 3.1-9 Photograph 8: View of Unit 2 from Bike Route 20, Looking South from Left Bank

Figure 3.1-10 Photograph 9: View of Unit 2 from Unnamed Path Adjacent to College of Marin Athletic Fields, Looking Northwest from Right Bank

The General Plans for Ross and Kentfield do not identify designated scenic vistas; however, the Ross General Plan provides polices addressing the protection of scenic vistas. Broad, publicly accessible views of the surrounding mountains and landscape from within the Town of Ross and Kentfield on the valley floor are limited due to intervening development and street trees, which draws the eye downward to street level or blocks middle-ground or background views. There are no designated scenic vistas within the project area.

Scenic Highways and Roadways

No designated State Scenic Highways or County roadways are located within Marin County; however, roadways throughout Marin offer views of the County's and the region's scenic resources. Two segments of Highway 101 in Marin County are eligible for inclusion on the list of State Scenic Highways: the segment opposite San Francisco/State Route 1 in Marin City, approximately 5 miles southeast of the project, and the segment near State Route 37/Ignacio in Novato, approximately 8 miles from the project. Highway 1 in Marin County is also eligible for inclusion on the list of State Scenic Highways and is approximately 4.5 miles from the project area. The project area is not visible from any eligible state scenic highway.

3.1.5 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

No federal laws or regulations for aesthetics and visual resources are applicable to the project.

State Regulations

State Scenic Highway Program

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. A highway may be designated as "scenic" based on the expanse of the natural landscape that can be seen by travelers, the scenic quality of that landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. A Scenic Corridor is described as the land generally adjacent to and visible from such a highway and is usually limited by topography and/or jurisdictional boundaries. In addition to State Highways, County roads are also eligible for scenic designation.

Title 24 Outdoor Lighting Standards – Nighttime Sky

The California legislature passed a bill in 2001 requiring the California Energy Commission to adopt energy efficiency standards for outdoor lighting for both the public and private sectors. The California Energy Commission adopted changes to Title 24, parts 1 and 6, Building Energy Efficiency Standards, which included changes to the requirements for outdoor lighting for residential and non-residential development. The standards regulate lighting characteristics, such as maximum power and brightness, shielding, and sensor controls to turn lighting on and off, which could affect nighttime views (California Energy Commission, 2015).

Regional and Local Regulations

Marin County Municipal Code

The following policies and codes of the Marin County Municipal Code related to aesthetics are applicable to the project (Marin County, 2020)

Chapter 22.27 Native Tree Protection and Preservation

Section 22.27.030 Prohibition on Removal of Protected Trees. Protected Trees shall not be removed except in compliance with Section 22.62.040 (Exemptions), and as provided for in Chapter 22.62 (Tree Removal Permits). (Ord. No. 3577, 2012)

Chapter 22.62 Tree Removal Permits

22.62.010 Purpose of Chapter. The purpose of this chapter is to establish regulations for the preservation and protection of native trees in the unincorporated areas of Marin County by limiting tree removal in a manner which allows for reasonable use and enjoyment of such property and to establish a procedure for processing Tree Removal Permits.

Section 22.62.040 Exemptions. The removal of any protected or heritage tree on a lot is exempt from the requirements of this Chapter if it meets at least one of the following criteria for removal:

A. The general health of the tree is so poor due to disease, damage, or age that efforts to ensure its long-term health and survival are unlikely to be successful;
B. The tree is infected by a pathogen or attacked by insects that threaten surrounding trees as determined by an arborist report or other qualified professional;
C. The tree is a potential public health and safety hazard due to the risk of its falling and its structural instability cannot be remedied;
D. The tree is a public nuisance by causing damage to improvements, such as building foundations, retaining walls, roadways/driveways, patios, sidewalks and decks, or interfering with the operation, repair, or maintenance of public utilities;
E. The tree has been identified by a Fire Inspector as a fire hazard;
F. The tree was planted for a commercial tree enterprise, such as Christmas tree farms or orchards;
G. Prohibiting the removal of the tree will conflict with CC&R's which existed at the time this Chapter was adopted;
H. The tree is located on land which is zoned for agriculture (A, ARP, APZ, C-ARP or C-APZ) and that is being used for commercial agricultural purposes. (This criterion is provided to recognize the agricultural property owner's need to manage these large properties and continue their efforts to be good stewards of the land.);
I. The tree removal is by a public agency to provide for the routine management and maintenance of public land or to construct a fuel break;

J. The tree removal is on a developed lot and: 1) does not exceed two protected trees within a one-year timeframe; 2) does not entail the removal of any heritage trees; and 3) does not entail the removal of any protected or heritage trees within a Stream Conservation Area or a Wetland Conservation Area.

It is recommended that a property owner obtain a report from a licensed arborist or verify the status of the tree with photographs to document the applicability of the criteria listed above to a tree which is considered for removal in compliance with this section. (Ord. No. 3577, 2012)

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project. Multiple Implementation Programs support each of these policies; they are described fully in the Countywide Plan (County of Marin, 2007).

Biological Resources

Goal BIO-4: Riparian Conservation.

Policy BIO-4.7: Protect Riparian Vegetation. Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.

Implementation Policy BIO-4.f, Identify Potential Impacts to Riparian Systems. At the time of a development application, evaluate potential impacts on riparian vegetation and aquatic habitat, and incorporate measures to protect riparian systems into the project design and construction. Retain and minimize disturbance to woody and herbaceous riparian vegetation in Stream Conservation Areas and adjacent areas. (Tree growth may be cleared from the stream channel where removal is essential to protect against property damage or prevent safety hazards.)

Community Design

Goal DES-4: Protection of Scenic Resources. Minimize visual impacts of development and preserve vistas of important natural features.

Policy DES-4.1: Preserve Visual Quality. Protect scenic quality and views of the natural environment — including ridgelines and upland greenbelts, hillsides, water, and trees — from adverse impacts related to development.

Implementing Program DES-4.a, Protect Key Public Views. Work with community groups to identify, map, and protect important view corridors. Establish design standards for development in these areas as part of the design review requirements and individual community plans (see DES-3.b).

Implementing Program DES-4.b, Minimize Visual Impacts of Public Facilities. Amend applicable codes and procedures to require appropriate placement,

design, setbacks, and native landscaping of public facilities (including soundwalls, medians, retaining walls, power lines, and water tanks) to reduce visual impacts, and encourage local agencies to adopt similar standards.

Town of Ross Municipal Code

The following policies and codes of the Town of Ross Municipal Code related to aesthetics are applicable to the project (Town of Ross, 2020).

Chapter 12.24 Planting, Alteration, Removal, or Maintenance of Trees

Purpose (5) To promote and Maintain the aesthetic values of the community in general for the benefit of those who currently reside in Ross and as a legacy to future residents. (Ord. 659 (part), 2015; Ord. 568 (part), 2002).

Section 12.24.080 Tree Alteration or Removal Permits and Appeal. (4) Replacement tree. Unless otherwise specified by the Public Works Director or Town Council, replacement trees shall be required at the following ratios:

(a) A tree in good or excellent condition and structure shall be replaced on a one-to-one trunk diameter basis. (Example: 1 21″ dbh tree in good or excellent condition must be replaced with new trees totaling 21″ trunk diameter);

(b) A tree in fair or marginal condition or structure shall be replaced on a three-to-one trunk diameter basis. (Example: a 21″ dbh tree in fair or marginal condition must be replaced with new trees totaling 7″ trunk diameter);

(c) A tree in poor condition or creating a hazard to a building and/or structure, shall be replaced with 2 inches replacement trunk diameter.

Inches of replacement tree may be translated into standard nursery planting sizes using the following formulas:

24″ box replacement tree = 2 inch replacement trunk diameter

36″ box replacement tree = 3 inch replacement trunk diameter

48″ box replacement tree = 4 inch replacement trunk diameter

If native species are removed, replacement trees shall be of a species native to those lands that now constitute the Town of Ross, or a non-native species approved by town staff based on specific site circumstances. Replacement trees should have the same mature size as the trees that have been removed, unless town staff recommends otherwise based on specific site circumstances. If there is a conflict between arborists regarding the condition or structure of a tree, the town arborist's decision shall control. The Town Council or Public Works Director may reduce the number of replacement trees or the tree replacement ratio, as applicable, if the reduction will not negatively impact the environmental functions and value of the urban forest or the aesthetic values of the community.

The applicant shall complete tree replacement within sixty (60) days of tree removal, unless the Town has approved a longer time. Failure to plant required tree replacement may subject the property owner to Administrative Penalties under Chapter 9.70 until the replacement trees are planted.

Section 12.24.100. Tree Protection Plan. To protect trees during construction of a project and thereafter, and to maximize the chances of their subsequent survival, a Tree Protection Plan shall be required on sites where Significant or Protected trees may be affected. The Tree Protection Plan shall include a certified arborist's report on existing conditions as well as a plan for tree protection during project construction.

(1) When a Tree Protection Plan is Required. A tree protection plan shall be required as part of the materials submitted with applications for Hillside Lot Permits and Hazard Zone Use Permits.

A Tree Protection Plan may be required for Subdivision Permits, Variances, Demolition Permits, Design Review, or Grading and/or Building Permit reviews at the discretion of the Public Works Director or Town Council, as applicable.

Chapter 18.41, Design Review

Purpose (b): This chapter is intended to guide new development to preserve and enhance these special qualities of Ross and to sustain the beauty of the town's environment.

Section 18.41.100 Design Review Criteria and Standards.
(a) Preservation of Natural Areas and Existing Site Conditions.

(1) The existing landscape should be preserved in its natural state by keeping the removal of trees, vegetation, rocks and soil to a minimum. Development should minimize the amount of native vegetation clearing, grading, cutting and filling and maximize the retention and preservation of natural elevations, ridgelands and natural features, including lands too steep for development, geologically unstable areas, wooded canyons, areas containing significant native flora and fauna, rock outcroppings, view sites, watersheds and watercourses, considering zones of defensible space appropriate to prevent the spread of fire.

(2) Sites should be kept in harmony with the general appearance of neighboring landscape. All disturbed areas should be finished to a natural-appearing configuration and planted or seeded to prevent erosion.

(d) Materials and Colors.

(2) Natural materials such as wood and stone are preferred, and manufactured materials such as concrete, stucco or metal should be used in moderation to avoid visual conflicts with the natural setting of the structure.

(3) Soft and muted colors in the earth-tone and wood-tone range are preferred and generally should predominate.

(g) Fences and Screening.

Fences and walls should be designed and located to be architecturally compatible with the design of the building. They should be aesthetically attractive and not create a "walled-in" feeling or a harsh, solid expanse when viewed from adjacent vantage points. Front yard fences and walls should be set back sufficient distance from the property line to allow for installation of a landscape buffer to soften the visual appearance. Transparent front yard fences and gates over four feet tall may be permitted if the design and landscaping is compatible and consistent with the design, height and character of fences and landscaping in the neighborhood. Front yard vehicular gates should be transparent to let light and lines of sight through the gate. Solid walls and fences over four feet in height are generally discouraged on property lines adjacent to a right-of-way but may be permitted for properties adjacent to Poplar Avenue and Sir Francis Drake Boulevard based on the quality of the design, materials, and landscaping proposed. Driveway gates should be automatic to encourage use of onsite parking. Pedestrian gates are encouraged for safety, egress, and to encourage multi-modal transportation and pedestrian-friendly neighborhood character.

(h) Views.

Views of the hills and ridgelines from public streets and parks should be preserved where possible through appropriate siting of improvements and through selection of an appropriate building design including height, architectural style, roof pitch and number of stories.

(i) Natural Environment.

(1) The high-quality and fragile natural environment should be preserved and maintained through protecting scenic resources (ridgelands, hillsides, trees and tree groves), vegetation and wildlife habitat, creeks, drainageways threatened and endangered species habitat, open space and areas necessary to protect community health and safety.

(j) Landscaping.

(1) Attractive, fire-resistant, native species are preferred. Landscaping should be integrated into the architectural scheme to accent and enhance the appearance of the development. Trees on the site, along public or private streets and within twenty feet of common property lines, should be protected and preserved in site planning. Replacement trees should be provided for trees removed or affected by development. Native trees should be replaced with the same or similar species. Landscaping should include planting of additional street trees as necessary.

(2) Landscaping should include appropriate plantings to soften or screen the appearance of structures as seen from off-site locations and to screen architectural and mechanical elements such as foundations, retaining walls, condensers and transformers.

(3) Landscape plans should include appropriate plantings to repair, reseed and/or replant disturbed areas to prevent erosion.

(4) Landscape plans should create and maintain defensible spaces around buildings and structures as appropriate to prevent the spread of wildfire.

(5) Wherever possible, residential development should be designed to preserve, protect and restore native site vegetation and habitat. In addition, where possible and appropriate, invasive vegetation should be removed.

Town of Ross General Plan

The following policies of the Ross General Plan related to aesthetics are applicable to the project (Town of Ross, 2007).

Goal 1. An Abundance of Green and Healthy Natural Systems

1.1 Protection of Environmental Resources. Protect environmental resources, such as hillsides, ridgelines, creeks, drainage ways, trees and tree groves, threatened and endangered species habitat, riparian vegetation, cultural places, and other resources. These resources are unique in the planning area because of their scarcity, scientific value, aesthetic quality and cultural significance.

Goal 3. Design with Nature, Neighborhood and Community

3.2. Landscape Design. Where appropriate, encourage landscape designs that incorporate existing native vegetation, enhance the cohesiveness of the Town's lush, organic landscape and integrate new planting with existing site features.

3.5 View Protection. Preserve views and access to views of hillsides, ridgelines, Mt. Tamalpais and Bald Hill from the public right-of-way and public property. Ensure that the design look and feel along major thoroughfares maintains the "greenness" of the Town.

Kentfield/Greenbrae Community Plan

The following goals of the Kentfield/Greenbrae Community Plan related to aesthetics are applicable to the project (Kentfield/Greenbrae Community Planning Group and Marin County Planning Department, 1987).

Goal 10: To the greatest extent possible, preserve the natural beauty and view corridors of the planning area. Protect and enhance environmental resources in accord with policies of the Marin Countywide Plan.

3.1.6 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Have a substantial adverse effect on a scenic vista;
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings (public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, the project would conflict with applicable zoning and other regulations governing scenic quality; or
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Given the nature of the project setting within a park and along a creek, impacts are analyzed in this section relative to the following additional threshold:

e. Substantially degrade the existing visual character or quality of public views (public views are those that are experienced from publicly accessible vantage point) of the site and its surroundings

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to changes in the visual character or other aesthetic impacts in the project area. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

Impacts to visual quality were assessed based on a combination of the existing visual quality, the visual sensitivity as described in Section 3.1.3 and the degree of degradative visual change that the project would cause as illustrated in Table 3.1-2 below. The degree of visual change was assessed using the baseline photos of the project area from public vantage points and visual simulations of the project from the same vantage point after project implementation. The baseline visual conditions and simulated visual conditions were compared to evaluate the degree of visual change that would result from the project. Visual changes and associated impacts are measured by three factors, described below:

- **Visual contrast** would be significant if it is strong as a result of regraded landforms, alteration or elimination of ridgelines, and changes introduced by a

project element that result in landscape colors, textures, and scale of visual elements that are inconsistent with project surroundings.

- **View obstruction** would be considered significant if the project component would obstruct foreground (0 to 0.5 mile) or middle-ground (0.5 to 3 miles) views of the "viewed area" seen from sensitive viewpoints. The viewed area is the area of landscape within the field of vision. The sensitive viewpoint is that from which a view of notable visual quality may be observed.
- **Degraded visual quality** would be considered significant if a project element severely alters or displaces specific scenic resources such as vivid landform features, aesthetic water bodies, mature stands of native/cultural trees (e.g., historic hedgerows), or historic structures.

Visual impacts would be considered to be significant overall based on the level of visual sensitivity and degree of visual change. Construction impacts on visual quality are assessed as those impacts that occur during the construction period. Operation and maintenance impacts are assessed as those impacts that persist after construction and into the operation and maintenance period for the project.

Table 3.1-2 Approach to Determining Significance of Visual Impacts

Visual Sensitivity	Visual Change: Low	Low to Moderate	Moderate	Moderately High	High
Low	Not Significant	Not Significant	Adverse, Not Significant	Adverse, Not Significant	Adverse, Not Significant
Low to Moderate	Not Significant	Adverse, Not Significant	Adverse, Not Significant	Adverse, Not Significant	Adverse, Not Significant
Moderate	Adverse, Not Significant	Adverse, Not Significant	Adverse, Not Significant	Adverse, Potentially Significant	Adverse, Potentially Significant
Moderate to High	Adverse, Not Significant	Adverse, Not Significant	Adverse, Potentially Significant	Adverse, Potentially Significant	Significant
High	Adverse, Not Significant	Adverse, Potentially Significant	Adverse, Potentially Significant	Significant	Significant

Not Significant. Impacts may or may not be perceptible but are considered minor in the context of existing landscape characteristics and view opportunity.

Adverse, Not Significant. Impacts are perceived as negative but do not exceed environmental thresholds.

Adverse, Potentially Significant. Impacts are perceived as negative and may exceed environmental thresholds depending on project and site-specific circumstances. Mitigation may be required to reduce impacts to less than significant.

Significant. Impacts with feasible mitigation may be reduced to less than significant levels or avoided all together. Without mitigation or avoidance measures, significant impacts would exceed environmental thresholds. If feasible mitigation does not avoid or reduce the degree of visual change to a level that would be less than significant, the impacts is significant and unavoidable.

3.1.7 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (b):** Implementation of the project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway because there are no designated or eligible state scenic highways within the project viewshed. No impacts would occur.
2. **Criterion (d):** Implementation of the project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the

area because no temporary or permanent lighting is proposed. No impacts would occur.

Impacts Analyzed

	Significance Determination
Impact 3.1-1: The project would not have a substantial adverse effect on a scenic vista.	**Construction: Less than Significant** **Operation and Maintenance: Less than Significant**

Construction

There are no designated scenic vistas within the Town of Ross or Kentfield. The Town of Ross and Kentfield are located on the valley floor, and scenic vistas on the valley floor are limited, given the intervening development, street trees, and vegetation. Because of the low profile of Corte Madera Creek, as well as the dense vegetation within the project area, construction of the project would not be visible from publicly accessible areas outside of Bike Route 20, informal unnamed paths, A.E. Kent Middle School, College of Marin campus, pedestrian and vehicle bridges, and public roads abutting or crossing the creek. While motorists could view project construction from bridges and public roads abutting or crossing the creek, views would be short-lived (a few seconds) given the speed of travel. Cyclists and pedestrians would be the primary viewers of project construction from the public areas listed above.

Scenic vistas are available from publicly accessible viewpoints along the ridgelines surrounding the valley floor. Corte Madera Creek is generally screened from view by trees from these viewpoints. Due to the distance from the ridgelines and the even cover of street trees and open space, specific details within the project area do not stand out. Project construction would include soil disturbing activities, including removal of the concrete channel within Frederick Allen Park and lower Unit 2, grading in Unit 4, tree removal, and excavation of larger fish pools. Construction of the project would involve removal of up to approximately 369 trees from along the creek, including up to 144 trees within Frederick Allen Park. The loss of these trees would have local visual effects in the short term as discussed in Impact 3.1-3; however, the tree removal would not substantially impact views from scenic vistas because the project area would not be discernible from the surrounding valley floor due to the distance of the project area from scenic viewpoints. The tree removal would occur along the creek but would not be a significant change in the tree cover in the context of the entire valley floor. The project would also not block views of any scenic vista because the project features are located below grade or are low lying. Because the project construction would not be visually discernible from any scenic vista and would not block views of any scenic vista, the impact would be less than significant.

Operation and Maintenance

Once constructed, the project area would include an earthen widened channel and realigned pathway through Frederick Allen Park, new floodwalls, new fish pools, new stormwater pump station, and concrete removal and creek habitat enhancement. As described above, the changes to the area resulting from the project components would not be discernible from scenic vistas

due to the distance of the project from the ridgelines and the limited extent of the new project components in the context of the larger valley floor. The project would not have a substantial adverse effect on views from any scenic vista because the project features would be indistinguishable from the background visual conditions at the distance of the project from potential scenic vistas. The project features are also low profile or below grade and would not block views of any scenic vista from the valley floor. Because the project would not be visually discernible from any scenic vista and would not block views of any scenic vista, the impact on scenic vistas during project operation would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.1-2: The project would not conflict with applicable zoning and other regulations governing scenic quality	**Construction: Less than Significant** **Operation and Maintenance: Less than Significant**

A discussion of the project's potential conflicts with adopted aesthetics or visual policies or standards is provided below. Because the project is located within an urban area designated in the Marin Countywide Plan, this analysis therefore focuses only on conflicts with applicable zoning and does not address visual quality consistent with CEQA Guidelines Appendix G. Visual quality is addressed separately in Impact 3.1-3, below.

Federal and State Regulations

There are no federal visual policies or standards related to aesthetics or visual resources applicable to the project. The project would not involve temporary or permanent nighttime lighting that would conflict with the Title 24 standards for outdoor lighting. The project would not conflict with federal or state visual policies or standards because none are applicable to the project.

Marin Municipal Code

Chapter 22.27, Native Tree Protection and Preservation, of the Marin Municipal Code prohibits tree removal except in compliance with Section 22.62.040 which requires tree removal permits prior to tree removal. Tree removal associated with the project would be exempt from the requirements Chapter 22.62, Tree Removal, because tree removal would be by a public agency to provide for routine management and maintenance of public land. Therefore, the project would not conflict with the Marin Municipal Code and there would be no impact.

Marin Countywide Plan

Marin Countywide Plan Policy BIO-4.7 calls for the protection of riparian vegetation, in part for aesthetics reasons. One of the objectives of the project is to improve fish passage, natural creek processes, and fish and riparian habitat adjacent to the creek. While construction of the project would involve the removal of trees and vegetation within Frederick Allen Park, the existing vegetation is separated from the creek by a 10-foot-tall concrete floodwall. The project would connect vegetation to the natural creek hydrology and increase riparian vegetation within Unit

4 and Frederick Allen Park (upper Unit 3). The project would increase vegetation interaction with the creek, resulting in long-term benefits to water quality in the creek and habitat. The project would have a beneficial impact on riparian habitat and would not conflict with Policy BIO-4.7.

The project would not conflict with Marin Countywide Plan Policy DES-4.1: Preserve Visual Quality. As described in Impact 3.1-1, the project would not impact scenic vistas or views of the natural environment. The project includes landscaping and tree planting that is compatible with the natural environment and would create a natural riparian corridor and saltwater marsh areas along portions of Corte Madera Creek. The tree planting would help screen the new concrete retaining walls over time and would be consistent with the policy. The proposed floodwall elements in Units 3 and 2 would result in low degree of visual contrast with the existing floodwall and would not obstruct the view of substantially degrade the visual quality of the area. The degree of visual change from the new floodwall would be low. Because the project would implement landscaping consistent with County design standards and would employ design features that are compatible with the existing visual context, the impact would be less than significant.

Town of Ross General Plan

The intent of Goal 1 of the Town of Ross General Plan is to protect environmental resources, including creeks trees and riparian vegetation, in part for their visual quality. As discussed above, the project would involve riparian vegetation planting to achieve the project objective of improvement to natural creek processes and fish and riparian habitat adjacent to the creek. Any trees removed within the Town of Ross would be replaced in compliance with Town of Ross requirements for tree replacement and the portion of the project in Unit 4 would have increased trees due planting of willows along the stream. The project would not conflict with Goal 1 of the Town of Ross General Plan because the project would benefit environmental resources and involve planting with trees that are native to the riparian environment; therefore, there would be no impact.

As discussed above under Goal 1, the proposed project would involve native riparian vegetation planting within Unit 4 and Upper Unit 3 (Frederick Allen Park), which would improve the existing riparian habitat adjacent to the creek. The proposed project would involve native tree planting in the park, including willows along the channel. The proposed project would be consistent with Policy 3.2 because landscaping would include planting native vegetation that would enhance the existing environment and have a beneficial impact on riparian habitat.

As discussed above and in Impact 3.1-1, the project would not impact scenic vistas or views, including views of hillsides, ridgelines, Mt. Tamalpais, and Bald Hill. No project components are proposed along major throughfares. The project would not conflict with Goal 3 of the Town of Ross General Plan; therefore, there would be no impact.

Town of Ross Municipal Code

Chapter 12.24 of the Municipal Code provides ratios for replacing trees that have been removed and requirements for a Tree Protection Plan. The project would adhere to the mitigation ratios and tree replacement standards in the Town of Ross Municipal Code, and the District would obtain a tree removal permit from the Town of Ross to ensure there would be no conflict. The District would prepare a Tree Protection Plan as part of the Design Review process. The Tree Protection Plan would include a certified arborist's report on the existing trees in the project area that could be affected by project construction and a plan for protecting existing trees during construction. Because the District would provide tree planting and replacement at the ratio required by the Town of Ross, ~~and~~ obtain a Tree Removal Permit ~~tree removal permit~~ from the Town of Ross, and prepare a Tree Protection Plan, the impact from conflict with Town of Ross Municipal Code would be less than significant.

Section 18.41.100 of the Municipal Code provides guidelines for development in the Town of Ross. The Town of Ross would be responsible for verifying that the proposed project complies with the Town's Design Review guidelines through the Design Review process. The following analysis is presented for informational purposes only and does not replace the Town of Ross's independent Design Review.

The proposed project would involve removal of trees and vegetation to construct a new riparian floodplain and natural creek channel. As discussed previously, the proposed project would adhere to mitigation ratios and tree replacement standards in the Town of Ross's Municipal Code and would involve planting riparian vegetation, to enhance habitat along the creek. Disturbed areas would be revegetated and planted with new trees, to maintain and enhance the landscape habitat along the creek. The proposed project also would remove the concrete walls within the creek channel and replace the concrete channel with a natural creek channel, which would be consistent with Section 18.41.100(a) of the Municipal Code. Therefore, the proposed project would comply with Design Review criteria and standards (a), Preservation of Natural Areas and Existing Site Conditions, and no impact would occur.

The concrete retaining wall in Frederick Allen Park would not extend above the ground surface and would be shorter than the existing concrete channel wall. Project landscaping and vegetation would minimize the visual contrast of the retaining wall with the surrounding area. The retaining wall would not conflict with the surrounding natural setting. The new floodwall in Frederick Allen Park would be 2 feet high and also would be screened by landscaping and native vegetation. Because native vegetation would be visible along the expanse of the floodwall, the floodwall would not conflict with the surrounding natural setting. The proposed project would result in a substantial net reduction in concrete in Frederick Allen Park and increase in use of natural materials, compared to existing conditions, and would comply with design review criteria and standards (d) Materials and Colors.

The proposed project would include a split-rail fence in Frederick Allen Park, which would be installed along the top of the channel to prevent encroachment into habitat areas during the vegetation establishment period. The split-rail fence could be removed after the habitat is

established. The split-rail fence would not create a solid expanse and would allow light and lines of site through the spaces in the fence. The fence would not conflict with design review criteria and standards (g) Fences and Screening, and no impact would occur.

As described under Impact 3.1-1, the proposed project would not impact scenic vistas or views, including views of hillsides and ridgelines. The proposed project would not conflict with Design Review criteria and standards (h) Views because the project elements would be low-lying and would not block any views of scenic vistas or ridgelines. Thus, no impact would occur.

The proposed project would not impact ridgelands, hillsides, or tree groves. The proposed project would replace the trees removed in Frederick Allen Park, in accordance with the Town of Ross's Municipal Code. The proposed project would include habitat enhancing elements, including riparian vegetation planting in Unit 4 and Upper Unit 3, and concrete channel removal in Upper Unit 3 and lower Unit 2. The proposed project would result in more natural creek conditions and enhanced habitat and would comply with the natural environment guideline (Section 18.41.100[i] of the Municipal Code). Therefore, the proposed project would not conflict with Design Review criteria and standards (i) Natural Environment. No impact would occur.

As discussed above, the proposed project would involve riparian vegetation planting, and trees proposed for removal would be replaced, per the Town of Ross's Municipal Code. Graded areas in Frederick Allen Park would be revegetated to prevent erosion. After being constructed, the proposed project would require ongoing vegetation management as a part of maintenance activities, which would include removal of invasive nonnative plans and revegetation with native plans. The proposed project would comply with design review criteria and standards (j) Landscaping. No impact would occur.

The proposed project would comply with all applicable Town of Ross design review criteria and standards and there would be no significant impact.

Kentfield/Greenbrae Community Plan

The intent of Goal 10 of the Kentfield/Greenbrae Community Plan is to preserve the natural beauty and view corridors of the planning area. As discussed previously, the project would not affect scenic views or vistas. The Kentfield/Greenbrae Community Plan would apply to portions of the project in lower Unit 3 and Unit 2. The project would not degrade the natural beauty or view corridors in the Kentfield community because the project is not located within the viewshed of any view corridors. The project would therefore not conflict with the Kentfield/Greenbrae Community Plan and there would be no impact.

Mitigation: None required.

	Significance Determination
Impact 3.1-3: The project would substantially degrade the existing visual character or quality of public views of the site and its surroundings	**Construction: Less than Significant**
	Operation and Maintenance: Significant and Unavoidable

Overview

Visibility

Public views of the project area are available from Frederick Allen Park, Bike Route 20, the informal unnamed paths adjacent to the creek opposite Bike Route 20, College of Marin Campus, and public roads abutting or crossing the creek. The analysis of project impacts on visual quality from public vantage points in Frederick Allen Park and along Bike Route 20 approximates the impacts on visual quality at adjacent private properties; however, impacts on private views are not required to be considered under CEQA.

Because of the low profile of the project, intervening buildings, and dense vegetation within the project area (adjacent to the creek and between residences and buildings that parallel the creek as well as along Sir Francis Drake Boulevard and Poplar/Kent Avenue), it was determined that the project would generally not be visible from public areas outside of Bike Route 20, informal unnamed paths, A.E. Kent Middle School, College of Marin campus, pedestrian and private vehicle bridges, and public roads abutting or crossing the creek.

Visual Quality

Key observation points (KOPs) were selected from areas where the project components would be visible in order to evaluate project changes on visual quality. Visual simulations were prepared for each of three selected KOPs in order to document the existing conditions and changes in visual character and quality that would occur as a result of the project. The selected KOP locations are shown on Figure 3.1-1. The visual-simulation locations were selected to provide a comprehensive view of the project elements and visual change. The visual simulation location within Frederick Allen Park was specifically selected because it is a location where the Bike Route 20 location would not be modified by the project, which provides for easy comparison between existing and post-project conditions. The visual simulation location at the southern limits of the proposed Frederick Allen Park grading also provides a comprehensive view of the changes within the park, end to end. The location of the visual simulation for the stormwater pump station provides an open, unimpeded view of the stormwater pump station infrastructure. The visual simulation of the taller floodwall is provided from an area where there is less vegetation screening on the Bike Route 20 pathway to allow for a more open view of the taller floodwall. The simulations provide a worst-case visual impact by showing the maximum amount of tree removal, and in the case of the new floodwall, we have also included a simulation showing the condition if a 15-foot vegetation setback from the existing floodwall is not required by the USACE in the Section 408 process.

As discussed under Section 3.1.4 Environmental Setting, Unit 4 is regarded as having moderate visual quality due to the natural channel characteristics of the creek and the vegetated banks; however, many human-made features and disturbances are present. The visual quality of Unit 3 within the Town of Ross is considered lower than the more natural condition of Unit 4 upstream. The overall appearance of the creek in Units 3 and 2 is characterized as highly modified, with low visual quality and scenic integrity. Frederick Allen Park within Unit 3 maintains a moderate visual quality due to the dense vegetation that blocks views of surrounding development and reduces and screens views of the concrete channel.

Viewer Sensitivity

Bike Route 20 is used by bicyclists and pedestrians as a recreational path and used by commuters traveling through the Town of Ross and Marin County. Viewer sensitivity of bicyclists and pedestrians varies along the length of Bike Route 20 within the project area.

Viewer sensitivity along Bike Route 20 within Unit 3 Frederick Allen Park is considered high, due the high number of viewers and the resting areas (e.g. benches) which allow for longer duration of views and more viewer exposure. Comments received during EIR scoping discuss the visual sensitivity of Frederick Allen Park and the importance of the tree canopy to the visual quality of the park. Additionally, bicyclists and pedestrians would be in close proximity to the changes proposed in Frederick Allen Park.

Viewer sensitivity along Bike Route 20 within Unit 3 Granton Park floodwall and Unit 2 floodwall areas is considered moderate. The existing floodwalls would minimize the degree to which modifications would be apparent in the visual setting and viewer attention would vacillate between the left bank, the creek, and the right bank. Viewer duration would be approximately six to eight minutes as viewers move along the pathway opposite the floodwall. Views of the floodwall would be interrupted by vegetation along the pathway that intermittently screens views of the concrete channel and floodwall. Similar to Unit 3 and Unit 2, viewer sensitivity along Bike Route 20 within the Unit 2 concrete channel removal area is considered moderate.

Laurel Avenue is within the project area adjacent to the proposed stormwater pump station and is used by motorist, bicyclists, and pedestrians. Viewer sensitivity within the Unit 3 stormwater pump station area is considered low to moderate due to the lower number of viewers and short duration of views from individuals driving on Laurel Avenue.

Lagunitas Road is within the project area and is used by motorists, bicyclists, and pedestrians. Viewer sensitivity along Lagunitas Road in the vicinity of Unit 4 is low because motorists, bicyclists, and pedestrian would be focused on the road, and not toward Unit 4 and the viewer exposure from Lagunitas Road toward Unit 4 is less than 100 feet and the view duration of the project area would last a few seconds as motorists, bicyclists and pedestrians cross Laguntias Road bridge.

Construction

Construction-related activities would temporarily influence the character of the project area as viewed from the Bike Route 20, informal unnamed paths, A. E. Kent Middle School, College of Marin campus, pedestrian and private vehicle bridges, and adjacent public roads. Graded surfaces, excavations, stockpiled soils, construction equipment and materials, and construction trucks and vehicles accessing the project area would be visible within portions of the project area during the seven-month construction period. The project would require the removal of a minimum of 167 trees and a maximum of approximately 369 trees from along the creek. While construction activities would result in a moderately high degree of visual change due to the removal of trees, alteration and grading in Frederick Allen Park, and presence of construction equipment materials. The public would be kept out of the construction area and a large segment of Bike Route 20 along the majority of Unit 3 and through Frederick Allen Park would be closed during the construction period for safety as discussed in Section 3.14 Transportation. Views of construction would be limited to views of floodwall installation in Unit 2 and a portion of lower Unit 3 where visual quality is low under existing circumstances. Viewer sensitivity during construction would be low to moderate because viewers would be less sensitive to the visual change from the presence of construction equipment and vehicles due to the limited views of construction work and temporary nature of project construction in lower Unit 3 and Unit 2. Construction of the floodwall in lower Unit 3 and Unit 2 would move along the floodwall installation area and construction would only occur in each area for a couple of weeks. The lower Unit 2 construction would last up to six weeks Because the majority of the construction area would be off limits to the public and out of view and the visible construction activities in lower Unit 3 and Unit 2 would be very short in duration, the impact on visual character and quality during the construction period is less than significant.

Operation and Maintenance

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

The proposed work within Unit 4 would consist of removal of the existing fish ladder, removal of 21 trees, grading within channel and banks, and channel stabilization measures including planted rock, vegetation, erosion-control fabric, and engineered streambed material.

The visual character of Unit 4 would not substantially change. Viewers would view a slightly lower and wider channel, particularly at the connection to Unit 3. The lowering of the channel would be very gradual and likely indiscernible as the channel approaches Lagunitas Road Bridge resulting in weak visual contrast. The channel bed would remain earthen, as it currently is. The removal of 21 trees from Unit 4 would not be obvious to viewers given the highly vegetated setting of Unit 4, and the larger trees along the streambanks and adjacent to Lagunitas Road that generally screen the channel would remain and the degree of visual change would be low. Publicly accessible views of Unit 4 are from the Lagunitas Road Bridge, and from the parking lot just south of the United States Postal Service building, west of the creek. Views from Lagunitas Road toward Unit 4 would last for seconds for motorists and bicyclists and less than a minute for pedestrians where the road crosses the creek. Motorists, bicyclists, and pedestrians would be traveling perpendicular to the creek and would have to adjust their views to the north or south to view the creek corridor where the roadway crosses the creek. The

project modifications in Unit 4 would not substantially degrade the existing visual character or quality of public views of the site or surroundings. Potential views into Unit 4 from adjacent public spaces would be short in duration; therefore, the viewer sensitivity would be low to moderate and the visual change would be low because all of the proposed project elements, including streambank stabilization measures and natural channel conditions, are currently visible within the Unit 4 viewshed. Once construction is complete, the publicly accessible views of Unit 4 would be similar to the existing visual setting. Because the viewer sensitivity is low to moderate and degree of visual change would be low, the resulting impact on visual character and quality would be less than significant.

Unit 3 Frederick Allen Park

An existing view of Frederick Allen Park from the tennis courts looking north is provided in Figure 3.1-11. The project elements within Frederick Allen Park include removal of the concrete channel, construction of concrete floodwalls, and excavation and grading within the channel and park to provide creek corridor widening and natural floodplain benches and banks connecting to Frederick Allen Park. The improvements also include a pedestrian path within the park. 10-foot-tall retaining walls would be installed on the left and right bank at the connection to Unit 4. An 80-foot-long floodwall, approximately 2 feet above ground, would be constructed along the western edge of Frederick Allen Park, and an approximately 240-foot-long 2-foot-tall floodwall would be constructed on the left bank of the creek. Existing shrubs and vegetation, including a minimum of 113 trees and a maximum of approximately 144 trees[1] would be removed from within the park to accommodate the new park design. A minimum of 89 trees and up to 125 trees would be planted within Frederick Allen Park depending on the final project design and USACE authorization[1]. The project also includes planting of other shrubs and vegetation as indicated on the planting plan in Appendix B. The District would also install temporary shade structures as required by Mitigation Measure 3.12-3: Temporary Shade Structures (see Section 3.12 Recreation) to provide temporary shade along Bike Route 20 after tree planting and until a tree canopy has re-established. A visual simulation of the park one year after construction (Figure 3.1-12) illustrates the proposed modifications to the park, following new landscape planting and prior to the new vegetation maturing, when the park grading and new retaining walls and structures would be most visible. Visual simulations of the vegetation approximately 10 and 20 years after landscaping (Figure 3.1-13 and Figure 3.1-14) show the expected visual conditions after vegetation establishment. The visual simulations on

[1] As discussed in Chapter 2, Project Description, the higher estimate of tree removal reflects a 15-foot separation between the proposed short floodwall and trees. The exact number of trees required for removal cannot be determined until the District has obtained USACE Section 408 authorization. The USACE guidelines for landscape plantings and vegetation management at levees and floodwalls requires a 15-foot separation between floodwalls and trees. It is uncertain whether USACE will consider the 2-foot-tall floodwall a structure that requires a 15-foot separation from trees.

Figure 3.1-12 through Figure 3.1-14 reflect the minimum number of trees that would be planted within the park with a 15-foot setback from the new floodwalls.

A key visual element in the existing Frederick Allen Park viewshed is the dense vegetation and large trees that form a canopy within the park and screen views of surrounding commercial and residential structures and the concrete channel. The tree canopy is a defining feature of the park and the vegetation and tree canopy contribute to the harmony, order, and coherence of the park.

The visual character of the park, as viewed from Bike Route 20, would change in the years immediately following construction from a pathway, highly vegetated on both sides with dense tree canopy cover, to a pathway with adjacent exposed areas of dirt in between the newly planted landscaping, the new exposed earthen channel, exposed retaining walls, and minimal tree cover and shade as shown in Figure 3.1-12. The area of tree removal would be replaced with native vegetation including shrubs, grasses, and riparian trees as shown in Appendix B; however, it would take approximately 10 to 20 years for the trees to mature and provide coverage comparable to existing conditions, as shown on Figure 3.1-13 and Figure 3.1-14. The surrounding structures would become more visible while the trees are establishing due to the reduction in tree canopy cover. Views of architectural elements, including homes and commercial buildings and new retaining walls, would be a deviation from the dense vegetation in the existing park setting and would result in a moderate to high degree of visual change. The moderate to high degree of visual change coupled with the high visual sensitivity would result in a significant impact on visual quality immediately following vegetation establishment and until the tree canopy and vegetation have re-established in the park. The proposed shade structures are not expected to be a substantial contributing element to the significant visual impact because the shade structure design would be selected in coordination with the Town of Ross to blend in harmoniously with the park environment. The District would implement **Mitigation Measure 3.1-3: Large Tree Planting**, which requires the District to integrate large box trees into the planting plan and design for Frederick Allen Park to the extent feasible. While planting larger trees in the park would minimize impacts to visual quality immediately following construction, the large box trees would not provide the same canopy cover and visual screening as the existing fully grown trees that would be removed. The impact to visual quality would remain significant and unavoidable in the years immediately following project implementation because the available mitigation (larger tree planting) would provide less dense canopy cover and associated screening of concrete walls and surrounding buildings than the existing tree canopy and vegetation.

After a period of approximately 10 years, a new tree canopy would become established, and the visual character of the park would be similar to the existing conditions where trees shade the pathway and screen views of the surrounding buildings and structures as shown in Figure 3.1-13. After 20 years, the trees would mature and an extensive tree canopy would cover the park, as shown in Figure 3.1-14. The improvements to the park, including tree planting, additional seating, educational signage, and access to the creek would provide views of a natural creek corridor and would provide greater wildlife viewing opportunities due to the

wildlife that would be attracted to the area. Under the District's MOU with the Town of Ross for maintenance in Frederick Allen Park, the District would be responsible for maintenance of replacement trees planted in the park, including monitoring establishment of trees after planting. This would ensure that the tree planting is successful, and that the tree canopy is established in the park. After a tree canopy has re-established in the park, the project would result in a more harmonious and coherent scene due to the integration of natural vegetation and consistency with the upstream Unit 4 natural channel. The resulting visual impact after tree canopy establishment would be beneficial. The visual contrast of the project retaining and floodwalls with the surrounding area would be lessened by the project landscaping and vegetation. While the impacts of the project on the existing visual character and quality at Frederick Allen Park would be significant and unavoidable immediately following construction and for a period of approximately 10 years, impacts would become less than significant and beneficial after the landscaping matures and provides cover and visual screening from the surrounding residential and commercial areas.

Unit 3 Granton Park Floodwall and Stormwater Pump Station

The project elements within the lower reach of Unit 3 include construction of floodwalls, a pump station at Laurel Avenue, removal of up to 94 trees (86 for floodwall segments #2 and #3 and eight for the pump station) and up to 16 fish pools within the channel.

The visual character of the stormwater pump station location is most apparent from the end of Laurel Avenue and slightly visible from Bike Route 20. Views of the stormwater pump station location from Bike Route 20 are obscured by existing vegetation growing along the fence at the top of the right bank floodwall. The existing visual setting at the stormwater pump station includes slightly disturbed vegetation adjacent to a paved roadway and residential development and college buildings and infrastructure (Figure 3.1-15). The pump station would generally be visible from Laurel Avenue and the surrounding area and would generally not be visible from Bike Route 20 because it would be located behind the newly constructed floodwall and the infrastructure would be low profile and mostly below grade. Figure 3.1-16 provides a visual simulation of the proposed pump station. The majority of the pump station would be underground, and the height of the above-ground components would be approximately 7 feet, with the dimensions of the concrete pad being 6 feet wide and 13 feet long. The pump station would have a weak visual contrast because the location is in a disturbed area surrounded by a paved roadway and existing development, resulting in low degree of visual change. The project would not substantially degrade the existing visual character or quality of public views of Unit 3 because of the low visual quality of the area and the weak visual contrast of the pump station. The low degree of visual change coupled with low to moderate visual sensitivity would result in a less than significant impact on visual quality.

The visual character of Unit 3, as viewed from Bike Route 20, would not substantially change. Approximately 1,075 feet of the left bank of the creek would change from an existing floodwall to a taller floodwall extending approximately 2 to 4 feet above the existing concrete wall. The floodwall could also be set back from the existing channel wall by approximately 10 feet at the edge of the District property. If the floodwall is constructed as an extension of the existing

channel wall, no trees would need to be removed as a part of the project. However, it is within the jurisdiction of USACE to require tree removal within 15 feet of the existing floodwall based on their guidance for landscape management along floodwalls. USACE could require tree removal within 15 feet of the existing floodwall at any time even if the project were not implemented, and tree removal could be required by USACE during project construction. Figure 3.1-17 shows an existing view of Unit 2, which is similar in visual quality to the lower reach of Unit 3. Figure 3.1-18 provides a visual simulation of the floodwall proposed in Unit 2, above the existing floodwall with vegetation removed from within 15 feet of the floodwall, and Figure 3.1-19 provides a visual simulation of the floodwall with the existing vegetation retained. With construction of the floodwall, the open area and disturbed vegetation on the left bank would no longer be visible. Views of the creek and the right bank of the creek would be maintained. Tree removal would not be obvious to viewers given the height of the new floodwall, which would block trees if they were retained behind the floodwall. While some trees would be visible behind the floodwall in the tree-retention option, the visual character and quality would not be substantially different from the view without trees. Because the existing setting of Unit 3 is of low visual quality, the slightly taller floodwall would have a weak visual contrast and the new floodwall in Unit 3 would not substantially degrade the existing visual character of Unit 3. The low degree of visual change coupled with the low to moderate visual sensitivity would result in a be less than significant.

Unit 2 Floodwall

The Unit 2 floodwall includes installation of a new floodwall approximately 2 to 4 feet tall and potential removal of up to 71 trees. As noted above, the floodwall may be attached to the existing floodwall or set back from the floodwall by approximately 10 feet. If the floodwall is attached to the existing floodwall, trees may not need to be removed; however, the USACE could enforce a 15-foot setback from the existing floodwall in accordance with their guidance.

The visual character of Unit 2, as viewed from Bike Route 20, would not substantially change. A 2- to 4-foot-tall floodwall would be visible at the top of the existing floodwall for a length of approximately 945 feet of the left bank of the creek. Figure 3.1-17 shows an existing view of Unit 2, and Figure 3.1-18 provides a visual simulation of the floodwall proposed in Unit 2, above the existing floodwall with removal of trees within 15 feet of the floodwall. Figure 3.1-19 provides a visual simulation of the floodwall with trees retained to illustrate the range of potential project conditions. With construction of the floodwall, the open area and disturbed vegetation on the left bank would no longer be visible. Views of the creek and the right bank of the creek would be maintained. As described under Unit 3, tree removal may be required by USACE along the floodwall. Tree removal would not be obvious to viewers given the height of the new floodwall, which would block trees if they were retained behind the floodwall. The visual quality of Unit 2 with trees removed would not be substantially different from the view with trees retained. Because the existing setting of Unit 2 is of low visual quality, the taller floodwall with or without tree removal would result in a weak visual contrast and would not substantially degrade the existing visual character of Unit 2. The low degree of visual change coupled with the low to moderate visual sensitivity would result in a less than significant impact.

Unit 2 Lower College of Marin Concrete Channel Removal

The visual character of the lower reach of Unit 2, as viewed from Bike Route 20 and the informal/unnamed path on the right bank below Stadium Way, would change from a concrete channel to a natural creek with tidal and wetland habitat and would include potential removal of up to 39 trees (see Figure 3.1-20 and Figure 3.1-21). The existing visual quality in the lower College of Marin concrete channel removal area is low. Removal of the concrete and creation of natural habitat with native vegetation would result in a beneficial impact and would reduce visual contrast with the lower reaches of Corte Madera Creek, where it widens and eventually flows into the San Francisco Bay. The transition of the concrete channel to natural creek would be an apparent beneficial visual change, reducing visual contrast with the surrounding natural creek channel. The visual impact from removing the concrete and creating salt marsh habitat would be beneficial and the low degree of visual change coupled with the low to moderate visual sensitivity would result in a less than significant impact.

Mitigation: Implement Mitigation Measure 3.1-3.

Mitigation Measure 3.1-3: Large Tree Planting. The District will integrate ~~large box trees~~ 24-inch or 36-inch box trees into the final planting plan and design for Frederick Allen Park to the extent ecologically appropriate for the proposed species. The Town of Ross will provide the desired size and species of trees to the District. The final planting plan will be provided to the Town of Ross for review and approval ~~comment~~ no less than 90 days prior to landscaping. The District will be responsible for maintaining replacement trees until they become established and for replacing dead trees for a period of no less than 10 years.

Significance after Mitigation: The mitigation would reduce the visual impact immediately following landscaping by providing increased screening of concrete structures and surrounding buildings; however, the impact would remain significant and unavoidable until the tree canopy is re-established and the trees and vegetation screen the retaining walls and adjacent structures.

Figure 3.1-11 KOP 1: Existing View of Frederick Allen Park, Unit 3

Figure 3.1-12 KOP 1: Visual Simulation of Frederick Allen Park, One Year After Construction

Figure 3.1-13 KOP 1: Simulation of Frederick Allen Park, 10 Years After Construction

Figure 3.1-14 KOP 1: Simulation of Frederick Allen Park, 20 Years After Construction

Figure 3.1-15 KOP 2: Existing View of Pump Station Location, Unit 3

Figure 3.1-16 KOP 2: Visual Simulation of Pump Station, Unit 3

Figure 3.1-17 KOP 3: Existing View of Floodwall Location, Unit 2

Figure 3.1-18 KOP 3: Visual Simulation of Floodwall with Trees Removed, Unit 2

Figure 3.1-19 KOP 3: Visual Simulation of Floodwall with Trees Retained, Unit 2

Figure 3.1-20 Existing View of Lower College of Marin Concrete Channel Removal, Unit 2

Figure 3.1-21 Visual Simulation of Lower College of Marin Concrete Channel Removal, Unit 2

3.1.8 References

California Energy Commission. (2015, June). 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings. *Title 24, Part 6, and Associated Administrative Regulations in Part 1*.

County of Marin. (2007, November 6). *Marin Countywide Plan*. Retrieved from https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update_r.pdf?la=en

Federal Highway Administration. (2015). *Guidelines for the Visual Impact Assessment of Highway Projects.*

Kentfield/Greenbrae Community Planning Group and Marin County Planning Department. (1987, May). Kentfield/Greenbrae Community Plan. Retrieved from https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/communityandareaplans/kentfield_greenbrae_community_plan_1987.pdf

Litton, R. B. (1968). *Litton, R. Burton, Jr. 1968. Forest Landscape Description and Inventories - A Basis for Land Planning and Design. (U.S. Department of Agriculture Forest Service Research Paper PSW-49.* Berkeley, CA: Pacific Southwest Forest and Range Experiment Station.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA).*

Marin County. (2020, November 16). Marin County Municipal Code. Retrieved from https://library.municode.com/ca/marin_county/codes/municipal_code

Marin County Bicycle Coalition. (2008). Countywide Bicycle Route System. Fairfax, California.

Town of Ross. (2007, June). Town of Ross General Plan. Retrieved from https://www.townofross.org/sites/default/files/fileattachments/planning/page/241/gp-part-i.pdf

Town of Ross. (2020). *Municipal Code*. Retrieved July 29, 2020, from https://www.townofross.org/administration/page/municipal-code

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3.2 Air Quality

3.2.1 Introduction

This section addresses the existing air quality conditions within the region and presents an evaluation of the potential effects to air quality from implementation of the project. The air quality analysis is based on air quality modeling and project features. Modeling assumptions and calculations are provided in Appendix C.

3.2.2 Scoping Comments

Comments related to air quality impacts were received during the public scoping process. These comments and the location where they are addressed in the air quality analysis are provided in Table 3.2-1.

Table 3.2-1 Air Quality Scoping Comments

Agency/Entity	Comment	Location in Air Quality Section that Comment is Addressed
Garril Page	No one in Ross welcomes the toxic traffic fumes of Sir Francis Drake Blvd. The FAP Riparian Corridor results in increased air pollution from SFD and diminished air quality for at least 10 years, probably longer, until proposed trees mature. Deciduous trees will be less effective in removing toxic fumes. and improving air quality. The longer construction period of FAP Riparian Corridor means extended, expanded exposure to all aspects of construction-caused air pollution.	Section 3.2.6, Impact 3.2-3

3.2.3 Environmental Setting

Air Pollutant Standards and Definitions

Overview

The U.S. Environmental Protection Agency (USEPA) has set air-pollutant emission standards to protect public health. USEPA has set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter. Particulate-matter criteria pollutants are classified as either respirable particulate matter less than 10 micrometers in diameter (PM_{10}) or fine particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$). The California Air Resources Board (CARB) has set California Ambient Air Quality Standards (CAAQS) for four pollutants in addition to the six NAAQS criteria pollutants: sulfates, hydrogen sulfide (H_2S), vinyl chloride (C_2H_3Cl), and visibility reducing particles. Table 3.2-2 presents the NAAQS and CAAQS for the criteria air pollutants at different averaging periods as well as the primary and

secondary standards for each. Primary standards are the levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

USEPA and CARB designate air basins or portions thereof as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the NAAQS or CAAQS have been achieved. Thus, areas in California have two sets of attainment/nonattainment designations: one set with respect to the national standards and one set with respect to the state standards. Table 3.2-2 shows the attainment status of the San Francisco Bay Area Air Basin (SFBAAB) with respect to the national and state ambient air quality standards for different criteria pollutants.

Ozone

Ozone is found in the upper atmosphere (as the ozone layer) as well as at ground level. At ground level, ozone is considered a pollutant. Ozone forms when ozone precursors (e.g., reactive organic gases [ROGs], CO, or nitrogen oxides [NO_X]) react with sunlight in the atmosphere. Sources of these precursors include fuel combustion in vehicles and industrial processes, gasoline vapors, and chemical solvents. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone can cause respiratory problems (e.g., chest pain, coughing, or throat irritation) and exacerbate existing respiratory problems such as asthma and bronchitis (USEPA, 2018a). Ozone is at the highest concentrations in summer. Ozone concentrations have steadily decreased in the Bay Area over the last three decades. Ozone one-hour NAAQS exceedances in the SFBAAB occurred on two days in 2017 compared to 36 days in 1980 (CARB, 2018a). Ozone is the main pollutant of concern for the NCCAB; however, ozone concentrations have also been steadily decreasing over the last three decades. Ozone eight-hour CAAQS exceedances in the NCCAB occurred on one day in 2018 compared to 32 days in 1980 (CARB, 2018b).

Nitrogen Dioxide

NO_2 is formed during combustion of fossil fuels from vehicles and industrial processes. NO_2 is an air quality pollutant of concern because it acts as a respiratory irritant. NO_2 is an ozone precursor and can also cause acid rain and acid snow. Health effects of NO_2 include airway inflammation in healthy people and exacerbation of preexisting asthma (USEPA, 2018a). NO_2 is a major component of the group of gaseous nitrogen compounds commonly referred to as NO_x. Typically, NO_x emitted from fuel combustion is in the form of nitric oxide (NO) and NO_x, with the vast majority (95 percent) of the NO_x emissions being comprised of NO. NO is converted to NO_2 in the atmosphere when it reacts with ozone or undergoes photochemical reactions.

Table 3.2-2 NAAQS and CAAQS for Criteria Air Pollutants and SFBAAB Attainment Status

Pollutant	Averaging Time	CAAQS [a]	Attainment Status for CAAQS	NAAQS [b]	Attainment Status for NAAQS
O_3	1 hour	0.09 ppm (180 µg/m^3)	Nonattainment	–	–
	8 hours	0.070 ppm (137 µg/m^3)	Nonattainment	0.070 ppm (137 µg/m^3) [c]	Nonattainment
CO	1 hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3) [d]	Attainment
	8 hours	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3) [d]	Attainment
NO_2	1 hour	0.18 ppm (339 µg/m^3)	Attainment	0.10 ppm (188 µg/m^3) [e]	–
	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	–	0.053 ppm (100 µg/m^3) [e]	Attainment
SO_2	1 hour	0.25 ppm (655 µg/m^3)	Attainment	0.075 ppm (196 µg/m^3)	–
	24 hours	0.04 ppm (105 µg/m^3)	Attainment	0.14 ppm (365 µg/m^3) [f]	–
	Annual arithmetic mean	None	–	0.030 ppm (81 µg/m^3) [f]	–
Pb	30-day average	1.5 µg/m^3	–	None	–
	Calendar quarter	–	–	1.5 µg/m^3 [g]	Attainment
	Rolling 3-month average	None	–	0.15 µg/m^3	Attainment
PM_{10}	24 hours	50 µg/m^3	Nonattainment	150 µg/m^3 [h]	Unclassified
	Annual arithmetic mean	20 µg/m^3	Nonattainment	None	–
$PM_{2.5}$	24 hours	None	–	35 µg/m^3 [i]	Nonattainment
	Annual arithmetic mean	12 µg/m^3	Nonattainment	12.0 µg/m^3 [j]	Unclassified/Attainment
Sulfates	24 hours	25 µg/m^3	Attainment	None	–
H_2S	1 hour	0.03 ppm (42 µg/m^3)	Unclassified	None	–
C_2H_3Cl	24 hours	0.01 ppm (26 µg/m^3)	No information available	None	–

Pollutant	Averaging Time	CAAQS [a]	Attainment Status for CAAQS	NAAQS [b]	Attainment Status for NAAQS
Visibility reducing particles	8 Hours	Extinction coefficient of 0.23 per kilometer	Unclassified	–	–

Notes:

[a] Pollutant concentrations should not exceed California standards for O_3, CO, SO_2 (1- and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility reducing particles. Pollutant concentrations shall not equal or exceed any other concentrations.

[b] Pollutant concentrations should not exceed national standards (other than O_3, particulate matter, and those based on annual arithmetic mean) more than once per year. Annual standards should never be exceeded.

[c] An area achieves the O_3 standard when the fourth-highest eight-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard.

[d] An area achieves the CO standard when fewer than two days are equal to or less than the standard.

[e] An area achieves the NO_2 standard when 98 percent of the one-hour maximum concentrations, averaged over three years, are equal to or less than the standard.

[f] No areas of SO_2 nonattainment are located in California.

[g] Los Angeles County is the only area of Pb nonattainment in California.

[h] An area achieves the PM_{10} 24-hour standard when the expected number of days with a 24-hour average concentration greater than 150 µg/m^3 is equal to or less than one in any one calendar year.

[i] An area achieves the $PM_{2.5}$ 24-hour standard when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

[j] An area achieves the $PM_{2.5}$ annual standard when the annual average concentrations, averaged over three years, are equal to or less than the standard.

mg/m^3 = milligrams per cubic meter

µg/m^3 = micrograms per cubic meter

ppm = parts per million

Sources: (CARB, 2016; BAAQMD, 2017b)

Carbon Monoxide

CO is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. The primary source of CO in urban areas is from motor vehicles. This being the case, higher concentrations of CO are found along transportation corridors. Exposure to CO results in reduced oxygen-carrying capacity of the blood. High CO concentrations can result in health risks, particularly for individuals with compromised cardiovascular systems (USEPA, 2018b). When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Particulate Matter

Particulate matter is a combination of liquid or solid particles suspended in the air. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. PM_{10} particles are a threat to health because they can enter the lungs and are small enough that the respiratory system cannot naturally filter them out. PM_{10} can exacerbate asthma and bronchitis and potentially contribute to premature death (USEPA, 2018a). $PM_{2.5}$ is considered more hazardous to human health than PM_{10} because it can contain a larger variety of dangerous components than PM_{10} and can travel farther into the lungs, potentially causing scarring of lung tissue and reduced lung capacity (USEPA, 2018a). Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. According to a study prepared by CARB, exposure to ambient $PM_{2.5}$, particularly diesel particulate matter (DPM), can be associated with approximately 14,000 to 24,000 premature annual deaths statewide (CARB, 2009). Particulate matter also can damage materials and reduce visibility.

Sulfur Dioxide

SO_2 is a colorless, acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease (BAAQMD, 2017a). Pollutant trends suggest that the SFBAAB currently meets and will continue to meet the federal and state standards for SO_2 for the foreseeable future.

In 2010, the USEPA implemented a new 1-hour SO_2 standard, which is presented in Table 3.2-2. The USEPA initially designated the SFBAAB as an attainment area for SO_2. Similar to the new federal standard for NO_2, the USEPA established requirements for a new monitoring network to measure SO_2 concentrations beginning in January 2013 (USEPA, 2010). No additional SO_2

monitors are required for the Bay Area because the SFBAAB has never been designated as nonattainment for SO_2, and no State implementation plans or maintenance plans have been prepared for SO_2 (BAAQMD, 2019).

Lead

Lead has a range of adverse neurotoxin health effects and was formerly released into the atmosphere primarily via leaded gasoline products. Leaded gasoline (phased out in the United States beginning in 1973), paint (on older houses, cars), smelters (metal refineries), and manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead is a highly stable compound that accumulates in the environment and in living organisms. In humans, lead exposures can interfere with the maturation and development of red blood cells, affect liver and kidney functions, and cause nervous system damage (CARB, 2020a). Lead is considered by CARB to be a toxic air contaminant. Any level of lead exposure has adverse health effects. The Bay Area Air Quality Management District (BAAQMD) monitors lead emissions from industrial operations through the toxic air contaminant (TAC) reporting process. In SFBAAB, there are no sources of lead that could exceed the national ambient air-quality standard (BAAQMD, 2019).

Ambient lead concentrations are only monitored on an as-warranted, site-specific basis in California. On October 15, 2008, the USEPA strengthened the national ambient air quality standard for lead by lowering it from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$ on a rolling three-month average. The USEPA revised the monitoring requirements for lead in December 2010. (Federal Register, 2010).

Regional Topography, Meteorology, and Climate

California is divided geographically into 15 air basins for the purpose of managing the air resources of the state on a regional basis. An air basin generally has similar meteorological and geographic conditions throughout. The project area is located within the Town of Ross and unincorporated areas of Marin County, which is within the SFBAAB, as shown in Figure 3.2-1. The SFBAAB covers roughly 5,340 square miles and consists of Napa, Marin, San Francisco, Contra Costa, Alameda, San Mateo, and Santa Clara Counties, the southern portion of Sonoma County, and the western portion of Solano County. The SFBAAB includes major urbanized areas, encompassing a population of about 7,000,000 (Panorama Environmental, Inc., 2017). The BAAQMD is the regulatory body responsible for air-quality-related activities in the SFBAAB.

Ambient air quality within SFBAAB is influenced by climatological conditions, topography, and the quantity and type of pollutants released in an area. The major determinants of transport and dilution of a given pollutant are wind, atmospheric stability, terrain, and sunshine for photochemical pollutants. The regional climate in SFBAAB is semi-arid and characterized by mild, dry summers and mild, moderately wet winters (about 90 percent of the annual total rainfall is received in the November to April period), moderate daytime onshore breezes, and moderate humidity. The climate is determined largely by a high-pressure system that is often present over the eastern Pacific Ocean off the West Coast of North America. In winter, the Pacific high-pressure system shifts southward, allowing storms to pass through the region.

During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate, and air pollution potential is very low. During winter periods, when the Pacific high becomes dominant, inversions become strong and often are surface based; winds are light and pollution potential is high. These periods are characterized by winds that flow out of the Central Valley into the Bay Area and often include tule fog. Climate is also affected by the moderating effects of the adjacent oceanic heat reservoir. In summer, when the high-pressure cell is strongest and farthest north, fog forms in the morning, and temperatures are mild. In winter, when the high--pressure cell is weakest and farthest south, occasional rainstorms occur. The air pollution potential is lowest for those regions closest to the San Francisco Bay, due largely to good ventilation and less influx of pollutants from upwind sources. The occurrence of light winds in the evenings and early mornings occasionally results in elevated pollutant levels. Wind flow patterns are controlled by air circulation in the atmosphere, which is affected by air pressure and the variable topography of the coastal areas adjacent to the San Francisco Bay (BAAQMD, 2017a).

Marin County is bounded on the west by the Pacific Ocean, on the east by San Pablo Bay and San Francisco Bay, on the south by the Golden Gate, and on the north by the Petaluma Gap. Most of Marin's population lives in the eastern part of the county, in small, sheltered valleys. These valleys act like a series of miniature air basins. Mount Tamalpais, with a peak of over 2,500 feet, has a substantial effect on climate in central Marin County by blocking the marine layer. In southern Marin, the distance from the ocean is short and elevations are lower, resulting in higher incidence of maritime air in the area. Wind speeds are highest along the west coast of Marin, averaging about 8 to 10 miles per hour. The complex terrain in central Marin creates sufficient friction to slow the air flow. The prevailing wind directions throughout Marin County are generally from the northwest. In the summer months, areas along the coast are usually subject to onshore movement of cool marine air. In the winter, proximity to the ocean keeps the coastal regions relatively warm, with temperatures varying little throughout the year. Coastal temperatures are usually in the high 50s in the winter and the low 60s in the summer. The warmest months tend to be September and October. The eastern side of Marin County has warmer weather than the western side because of its distance from the ocean and because the hills that separate eastern Marin from western Marin occasionally block the flow of the marine air. The temperatures of cities next to the Bay are moderated by the cooling effect of the Bay in the summer and the warming effect of the Bay in the winter. For example, San Rafael experiences average maximum summer temperatures in the low 80s and average minimum winter temperatures in the low 40s (BAAQMD, 2017a).

Air pollution potential is highest in eastern Marin County, where most of population is located in semi-sheltered valleys. In the southeast, the influence of marine air keeps pollution levels low. As development moves further north, there is greater potential for air pollution to build up because the valleys are more sheltered from the sea breeze. While Marin County does not have many polluting industries, the air quality on its eastern side, especially along the U.S. Highway 101 corridor, is affected by emissions from increasing motor vehicle use within and through the county.

Figure 3.2-1 San Francisco Bay Area Air Basin Boundary

Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, US Geological Survey 2013, California Air Resources Board, Planning and Technical Support Division 2004)

Existing Air Quality

BAAQMD operates a regional monitoring network of air quality monitoring stations to measure the ambient concentrations of criteria pollutants. Existing levels of air pollutants in the study area can be inferred from ambient air quality measurements conducted by BAAQMD at its stations within and close to the project area. The monitoring station that best represents the air quality in the project area is located at 534 4th Street in San Rafael. Table 3.2-3 shows a five-year summary of data collected at this station for ozone, PM_{10}, $PM_{2.5}$, and NO_2. The table also compares the data to CAAQS and NAAQS.

As shown in Table 3.2-3, there were no exceedances of state and national ozone standards between 2014 and 2018. The 24-hour State PM_{10} standard was exceeded on approximately 12 days over the five years, and the 24-hour national PM_{10} standard was exceeded on approximately six days over the five years, but there were no exceedances of the state annual average PM_{10} standard. The national 24-hour $PM_{2.5}$ standard was exceeded on 24 days between 2014 and 2018. There were no measured exceedances of the annual average state or national $PM_{2.5}$ standards or the state or national NO_2 standards. CO, SO_2, and lead were not monitored at the San Rafael station over the five-year study period; however, concentrations of these pollutants are expected to be well below standards in the project area (CARB, 2018).

Toxic Air Contaminants

Health Effects

TACs are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including DPM emissions from diesel-fueled engines, which was identified as a TAC by CARB in 1998 (CARB, 2011).

Sensitive Receptors

For the purposes of air quality analysis, sensitive receptors are defined as facilities and land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include residential areas, schools, hospitals, and daycare centers. The reasons for greater-than-average sensitivity include pre-existing health problems, proximity to emissions sources, and duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, which results in greater exposure to ambient air quality. Sensitive receptors in the project vicinity include residential neighborhoods and schools in the Town of Ross and the unincorporated census-designated place of Kentfield in Marin County.

Table 3.2-3 Air Quality Data Summary (2014–2018) for the Project Vicinity

Pollutant	Monitoring Data by Year				
	2014	2015	2016	2017	2018
Ozone					
Highest 1-hour average (ppm)	0.088	0.081	0.088	0.088	0.072
Days over state standard (0.09 ppm)	0	0	0	0	0
Highest 8-hour average (ppm)	0.068	0.070	0.067	0.063	0.053
Days over state standard (0.070 ppm)	0	0	0	0	0
Days over national standard (0.070 ppm)	0	0	0	0	0
Respirable Particulate Matter (PM_{10})					
Highest 24-hour average – state (µg/m^3)	40.9	42.0	27.0	94.0	166.0
Days over State 24-hour standard (50 µg/m^3)	0	0	0	-	12.2
Highest 24-hour average – national (µg/m^3)	39.0	42.2	26.6	91.5	160.0
Days over national 24-hour standard (150 µg/m^3)	0	0	0	-	6.1
State annual average (Standard: 20 µg/m^3)	14.1	16.1	13.8	-	18.9
Fine Particulate Matter ($PM_{2.5}$)					
Highest 24-hour average – state (µg/m^3)	38.1	36.3	15.6	74.7	167.6
Days over national standard (35 µg/m^3)	1.0	2.0	0.0	8.1	13.0
State annual average (Standard: 12 µg/m^3)	10.8	-	-	9.7	11.1
National annual average (Standard: 12 µg/m^3)	10.8	8.6	6.4	9.7	11.1
Nitrogen Dioxide (NO_2)					
Highest hourly average (ppm)	0.062	0.044	0.045	0.053	0.055
Days over state standard (0.18 ppm)	0	0	0	0	0
Days over national standard (0.1 ppm)	0	0	0	0	0

Notes:

- Indicates that data are not available. Measurements are from the monitoring station at 534 4th Street in San Rafael.

ppm = Parts per million

µg/m^3= Micrograms per cubic meter

Source: (CARB, 2018)

Sensitive land uses within 1,000 feet of the project area include single-family residences along the eastern and western edges of Corte Madera Creek, Ross Elementary School, Kentfield Hospital, Kent Middle School, and the College of Marin. The average distance between Corte

Madera Creek and the closest sensitive receptor is approximately 50 feet. However, residences on Sylvan Lane and along Corte Madera Creek near the left bank of the fish ladder are within 25 feet of the project. Ross Elementary School is approximately 300 feet from the nearest project component, while the College of Marin and Kent Middle School border Corte Madera Creek, within 25 feet of the project area. Kentfield Hospital also borders Corte Madera Creek and is located within 25 feet of the project area. The sensitive receptors within 1,000 feet of the project area are shown on Figure 3.2-2.

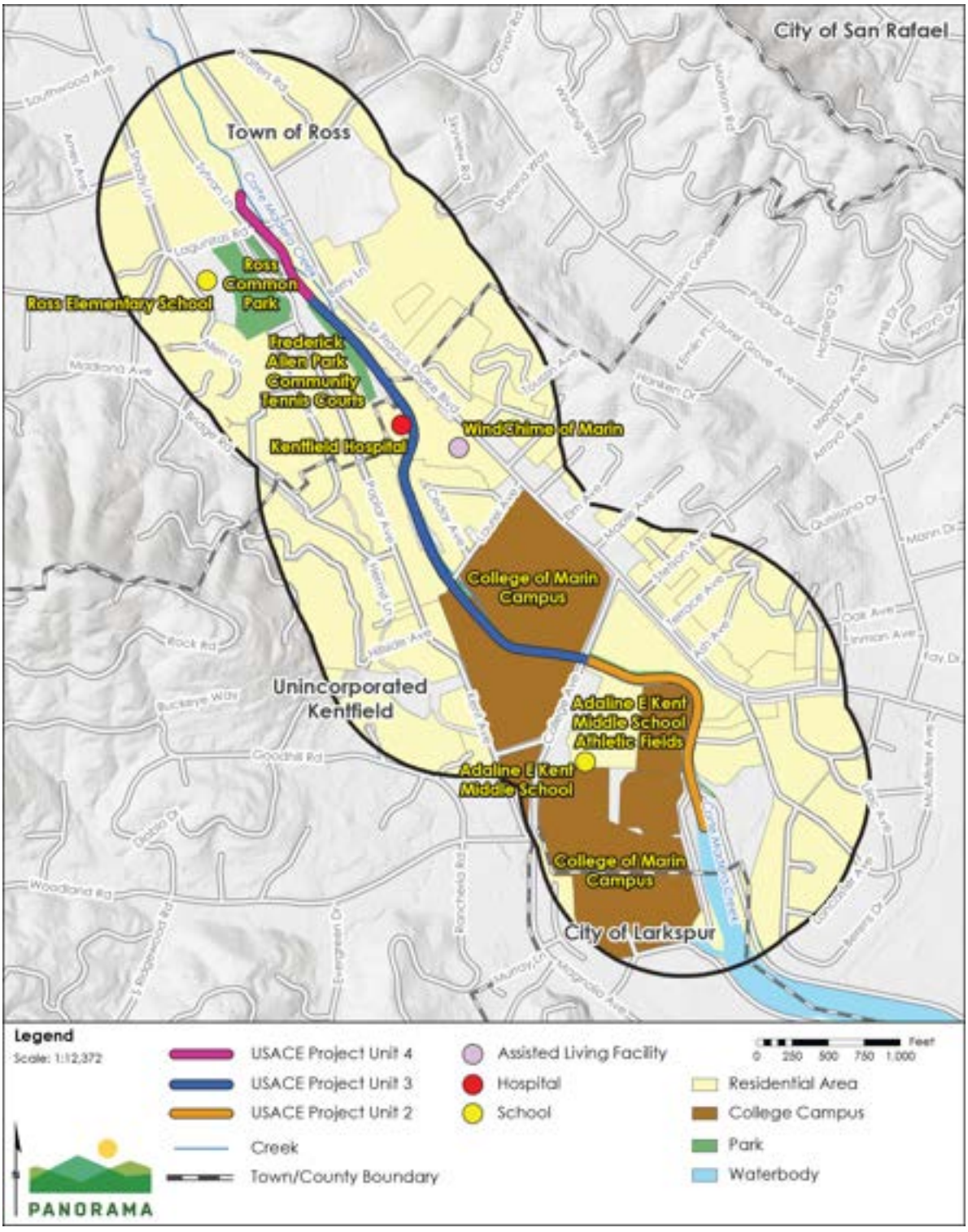
Naturally Occurring Asbestos

Asbestos is a group of naturally occurring fibrous minerals that were commonly used from the mid-1940s to the mid-1980s in building materials because of their high tensile strength and flexibility as well as fire-retardant properties. Asbestos was identified by CARB as a TAC and is classified as a known human carcinogen by state, federal, and international agencies (CARB, 2011). Inhaled asbestos dust in any quantity can contribute to eventual severe health problems such as mesothelioma and other cancers (WHO, 2012). While serpentine soils and bedrock are found in Marin County, none underlie the project area (NRCS, 2017 updated 2019; USGS, 2017 updated 2019).

Dry Deposition of Particulate Matter

Research has shown that trees and plants can remove particulate matter from the air through a process known as dry deposition. Dry deposition is a process by which particles in the atmosphere deposit themselves on a surface, decreasing the atmospheric concentration of particulate matter. The process by which this occurs is particulate matter concentrations in an incoming air flow pass through tree canopies and vegetation, within which a fraction of the particulate matter is removed. A small portion of the incoming airflow is deflected by the canopy instead of passing through it, which can result in locally higher concentrations of particulate matter upwind of a tree. Much of the fine particulates, $PM_{2.5}$, become permanently incorporated into leaf wax or cuticle, while a portion of the coarse fraction is resuspended as a function of wind speed. The remainder of the coarse fraction is eventually washed off to the ground by precipitation. The reduction in particulate matter concentration due to dry deposition is localized to generally within 30 meters (98 feet), with very little reduction in concentration beyond 300 meters (984 feet) of the tree or trees. The rate of dry deposition is greater in areas with higher atmospheric concentrations of particulate matter and associated with larger leaf surface area. Other factors that affect deposition include wind speed, temperature, and relative humidity (McDonald, et al., 2016). Based on studies, the percent air quality improvement estimated to be provided by urban trees due to dry deposition and other processes ranges from 0.2 to 1.0 percent for coarse particulates, depending upon the location, due to variation in weather, tree cover, and tree species (Nowak, Crane, & Stevens, 2006).

Figure 3.2-2 Sensitive Receptors within 1,000 Feet of the Project Area



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, US Geological Survey 2013, Esri, United States Geological Survey, U.S. Geographic Names Information System 2020)

3.2.4 Regulatory Setting

Federal and State Regulations

United States Environmental Protection Agency – Clean Air Act

The USEPA is responsible for enforcing the federal Clean Air Act (CAA) and the 1990 amendments. The NAAQS, as previously discussed, were established by the federal CAA of 1970 and amended in 1977 and 1990. The USEPA is responsible for implementing programs established by the federal CAA, such as establishing and reviewing the NAAQS for the following air pollutants: CO, ozone, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The federal CAA also requires the USEPA to designate areas (counties or air basins) as attainment or non-attainment with respect to each criteria pollutant, depending on whether the area meets the NAAQS. As part of its enforcement responsibilities, the USEPA requires each state with non-attainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, State, and local plan components and regulations to identify specific measures to reduce pollution in non-attainment areas, using a combination of performance standards and market-based programs. The project activities must comply with the thresholds set by the local air district, which are intended to meet NAAQS and achieve the goals of the SIP. Air quality within the SFBAAB does not attain the federal standards for ozone or $PM_{2.5}$.

California Air Resources Board – California Clean Air Act

CARB oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1989 amendments to the California Clean Air Act (CCAA), responding to the federal CAA requirements, and regulating emissions from motor vehicles and consumer products within the state. CARB is the agency delegated responsibility for preparing and submitting the SIP to the USEPA. CARB also oversees air quality policies in California and has established CAAQS for NO_2, CO, PM_{10}, $PM_{2.5}$, SO_2, ozone, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Most of the CAAQS are at least as stringent (and typically more stringent) as the NAAQS. Similar to the USEPA, CARB designates counties or air basins in California as attainment or nonattainment with respect to the CAAQS. Air quality within the SFBAAB does not attain the state standards for ozone, PM_{10}, or $PM_{2.5}$. Activities associated with implementation of the project must comply with the thresholds set by the BAAQMD, which are intended to meet the CAAQS.

Regional Regulations

Bay Area Air Quality Management District – Overview

BAAQMD maintains air quality conditions in the project area in Marin County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of BAAQMD includes the preparation of plans and programs for the attainment of ambient-air-quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. BAAQMD also inspects stationary sources, responds to citizen complaints,

monitors ambient-air quality and meteorological conditions, and implements other programs and regulations required by the CAA and CCAA.

As mentioned above, BAAQMD adopts rules and regulations. All projects, including the project analyzed in this EIR, are subject to BAAQMD's rules and regulations in effect at the time of construction or implementation. Specific plans applicable to the activities associated with the project or alternatives being considered may include, but are not limited to, the regulations listed below (BAAQMD, 2019b).

Bay Area Air Quality Management District – Bay Area 2001 Ozone Attainment Plan
BAAQMD prepared the San Francisco Bay Area 2001 Ozone Attainment Plan for the one-hour National Ozone Standard (2001 Ozone Attainment Plan) to reduce ozone-forming emissions in SFBAAB by implementing emissions-reductions measures for stationary, area, and mobile sources, such as reductions in off-gassing of architectural coatings and organic liquids, low-emission vehicles, expansion of express bus systems, and bicycle and pedestrian programs. The 2001 Ozone Attainment Plan was adopted on November 1, 2001, as a revision to the California SIP (BAAQMD, 2001). The 2001 Ozone Attainment Plan identified proposed control measures for stationary, area, and mobile sources to improve air quality and re-attain the national 1-hour ozone standard in SFBAAB. BAAQMD does not have the jurisdiction to adopt mobile-source control measures. Mobile-source control measures were proposed for CARB to review and adopt as part of the California SIP.

Bay Area Air Quality Management District – 2017 Clean Air Plan
BAAQMD adopted the 2017 Clean Air Plan (CAP) to address state nonattainment in SFBAAB for both the one- and eight-hour ozone standards. The 2017 CAP details a control strategy to address ozone precursors (typically ROGs and NO_x), particulate matter, and TACs. The 85 control measures are categorized into nine economic sectors, including transportation, energy, agriculture, and natural and working lands (BAAQMD, 2017a). The 2017 CAP would apply to the project.

Local Plans and Policies

Marin County Countywide Plan
The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007):

Goal AIR-1: Improved Regional Air Quality. Promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area.

> ***Policy AIR-1.2: Meet Air Quality Standards***. Seek to attain or exceed the more stringent of federal or State Ambient Air Quality Standards for each measured pollutant.
>
> ***Policy AIR-1.3: Require Mitigation of Air Quality Impacts***. Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.

Implementing Program AIR-1.g: Require control measures for construction and agricultural activity. Require reasonable and feasible measures to control particulate emissions (PM-10 and PM-2.5) at construction sites and during agricultural tilling activity, pursuant to the recommendations in the BAAQMD CEQA Guidelines, which may include the following:

1. Watering active construction or agricultural tilling areas.
2. Covering hauled materials.
3. Paving or watering vehicle access roads.
4. Sweeping paved and staging areas.

Goal PFS-4: Efficient Processing and Reduced Landfill Disposal of Solid Waste. Minimize, treat, and safely process solid waste materials in a manner that protects natural resources from pollution while planning for the eventual reuse or recycling of discarded material to achieve zero waste.

Policy PFS-4.4: Promote Regulatory Efforts. Support State legislative or regulatory efforts that will aid in achieving zero waste.

Implementing Program PFS-4.b: Divert Construction Waste. Continue to implement the construction and demolition recycling waste ordinance to divert construction waste from landfills.

3.2.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Conflict with or obstruct implementation of the applicable air quality plan;
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard;
c. Expose sensitive receptors to substantial pollutant concentrations; or
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Significance Thresholds

BAAQMD released the 2017 Air Quality CEQA Guidelines,[1] which included thresholds of significance, in May 2017 to assist lead agencies in determining when air-quality emissions would be considered significant under CEQA. Table 3.2-4 identifies quantitative criteria air pollutant significance thresholds and is followed by a discussion of each threshold. Projects that would result in criteria pollutant emissions below these significance thresholds would not violate an air quality standard, contribute substantially to an air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants within the SFBAAB. Both sets of thresholds (average daily and maximum annual) apply to operational emissions from a given project. Construction emissions are assessed solely with respect to the average daily thresholds, pursuant to BAAQMD guidance, because of the temporary nature of construction-related emissions (BAAQMD, 2017a).

Any project that would have the potential to expose sensitive receptors to substantial levels of toxic air contaminants such that it would result in an incremental increase in cancer or non cancer health risk, or in an increase in ambient PM2.5 concentrations in excess of the thresholds identified in Table 3.2 4, would be considered to have a significant impact on sensitive receptors (BAAQMD, 2017a). The PM2.5 threshold for construction is applied to exhaust emissions only and does not include concentrations of fugitive dust (BAAQMD, 2017a). Depending on the distance separating construction activities from the nearest sensitive receptors and the concentration of construction DPM and PM2.5 exhaust emissions generated by the project elements, health-risk impacts on sensitive receptors may occur.

The thresholds of significance for criteria air pollutants and health risk are based on substantial evidence presented in Appendix D of the BAAQMD CEQA Air Quality Guidelines and BAAQMD's Revised Draft Options and Justification Report concerning CEQA thresholds (BAAQMD, 2017a; BAAQMD, 2009). Based on the substantial technical research that went into the preparation of the thresholds by BAAQMD, this analysis uses the BAAQMD thresholds and the methodologies in its 2017 Air Quality CEQA Guidelines to determine the significance of the project's impacts on air quality and sensitive receptors.

Approach to Impact Analysis

The evaluation of potential impacts to regional and local air quality that may result from the construction and long-term operations of the project is described below. Additional details on the air quality modeling are provided in Appendix C.

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[1] A subsequent update of BAAQMD's Air Quality CEQA Guidelines will be released to address outdated references, links, analytical methodologies, or other technical information that may be in the 2017 Air Quality CEQA Guidelines or Thresholds Justification Report.

Table 3.2-4 Significance Thresholds

Pollutant	Construction-Related	Operations-Related	
	Average Daily Emissions (pounds per day)	Average Daily Emissions (pounds per day)	Maximum Annual Emissions (tons per year)
ROG	54	54	10
NOx	54	54	10
PM_{10}	82 (exhaust)	85	15
$PM_{2.5}$	54 (exhaust)	54	10
PM_{10} / $PM_{2.5}$ (fugitive dust)	Construction dust ordinance or other best management practices to control fugitive dust emissions	Not applicable	
Risk and hazards for new sources and receptors (individual project) *	Same as operational thresholds **	Increased cancer risk of >10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient $PM_{2.5}$ increase: > 0.3 µg/m^3 annual average Zone of Influence: 1,000-foot radius from property line of source or receptor	
Risk and Hazards for new sources and receptors (cumulative threshold) *	Same as operational thresholds **	Cancer: > 100 in a million (from all local sources) Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic) $PM_{2.5}$: > 0.8 µg/m^3 annual average (from all local sources) Zone of Influence: 1,000-foot radius from property line of source or receptor	

Notes:

*The receptor thresholds were the subject of litigation in California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal. 4th 369.

** The BAAQMD recommends that for construction projects that are less than one-year duration, Lead Agencies should annualize impacts over the scope of actual days that peak impacts are to occur, rather than the full year.

Source: (BAAQMD, 2017a)

Criteria Air Pollutant Assessment

Overview

By definition, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to, by itself, result in nonattainment of air quality standards. Instead, a project's individual emissions are considered to contribute to the existing, cumulative air quality conditions. If a project's contribution to cumulative air quality conditions is considerable, then the project's impact on air quality would be considered significant (BAAQMD, 2017a).

The potential for a project to result in a cumulatively considerable net increase in criteria air pollutants that may contribute to an existing or projected air quality violation is based on the federal and state Clean Air Acts' emissions limits for stationary sources. To ensure that new stationary sources do not cause or contribute to a violation of an air quality standard, BAAQMD Regulation 2, Rule 2, requires that any new source that emits criteria air pollutants above a specified emissions limit must offset those emissions.

Construction Emissions

Average daily emissions during construction are calculated from estimated construction activities developed by the project engineers and applying the appropriate emissions factors for each source of emissions. Equipment, fugitive dust from disturbance, and worker-trip emissions were estimated for the project using the California Emissions Estimator Model (CalEEMod) (version 2016.3.2), which is a statewide land-use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify criteria pollutant emissions from a variety of projects. CalEEMod was developed in collaboration with the air districts of California. Regional data (e.g., emission factors, trip lengths, meteorology, source inventory) have been provided by the various California air districts to account for local requirements and conditions. The model is considered to be an accurate and comprehensive tool for quantifying air quality impact from projects throughout California and is recommended by the BAAQMD.[2] Pollutant emissions from truck trips were estimated based on the emission factors developed in the EMission FACtors 2017 (EMFAC2017) model and USEPA AP-42 methodologies.

Vehicle-exhaust-emission factors (including running, evaporative, starting, idling, brake-wear, and tire-wear emissions) were derived based on modeling results from the EMFAC2017 model developed by the CARB (CARB, 2017).[3] Fugitive dust emissions from trucks traveling on paved roads were estimated based on the USEPA AP-42 methodologies (USEPA, 2006; USEPA, 2011).

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[2] California Emissions Estimator Model is available at: http://caleemod.com/.

[3] On September 19, 2019, the USEPA and the National Highway Traffic Safety Administration (NHTSA) enacted the "Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program," which they had proposed in 2018 to roll back corporate annual fuel economy standards issued during the Obama Administration. The One National Program was immediately challenged in federal court. The day after it was issued, California's Attorney General, Xavier Bercerra, with 23 states and the District of Columbia, Los Angeles, and New York City, sued the Trump Administration, arguing that the "preemption rule" is "unlawful, disregards the National Environmental Policy Act and is arbitrary and capricious, among other complaints." Observers predict that the legal battle will go all the way to the Supreme Court, which means that the rule will be tied up in litigation for the next few years. Although CARB has issued EMFAC adjustment factors for gasoline light-duty vehicle emissions, these adjustment factors are very small (less than 1.2 percent by 2028). Despite the SAFE vehicles rule undergoing litigation, and since the adjustment factors are very small, the impact of the SAFE vehicles rule was accounted for quantitatively in this analysis.

Detailed calculations are provided in Appendix C of this Draft EIR. Average daily emissions represent the emissions that would occur for every day of project construction in the project area in 2022, over a period of approximately seven months. The average daily emissions are compared to the BAAQMD average daily emissions thresholds.

Operational Emissions

Operational emissions were estimated for the project using CalEEMod software for the pumps and 150-kW backup generator. Average daily operational emissions represent total emissions that would occur from operation of the pump and generator divided by 365 total days each year. The average daily emissions are compared to the BAAQMD average daily emissions thresholds.

Other Criteria Pollutants

Regional concentrations of CO in the Bay Area have not exceeded the state standards in the past 11 years, and SO_2 concentrations have never exceeded the standards. The primary source of CO emissions from development projects is vehicle traffic. Construction-related SO_2 emissions represent a negligible portion of the total basin-wide emissions, and construction-related CO emissions represent less than five percent of the total basin-wide CO emissions. As discussed previously, the SFBAAB is in attainment for both CO and SO_2. Furthermore, the BAAQMD has demonstrated, based on modeling, that to exceed the California ambient air quality standard of 9.0 ppm (eight-hour average) or 20 ppm (one-hour average) for CO, project traffic in addition to existing traffic would need to exceed 44,000 vehicles per hour at affected intersections (or 24,000 vehicles per hour where vertical and/or horizontal mixing is limited).[4] The project would not generate any new vehicle trips outside of construction vehicles because it does not have an operational component. Maximum average daily construction vehicle trips during construction would be significantly less than 24,000 vehicles per hour. Therefore, given the SFBAAB's attainment status and the limited CO and SO_2 emissions that could result from the project, the project would not result in a cumulatively considerable net increase in CO or SO_2, and a quantitative analysis relative to these pollutants is not required.

Toxic Air Contaminants Assessment

The health risk assessment was conducted in accordance with the Office of Environmental Health Hazards Assessment (OEHHA) Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015), CARB and California Air Pollution Control Officers Association Risk Management Guidance for Stationary Sources of Air Toxics (CARB and CAPCOA, 2015), and BAAQMD Air Toxics NSR Program Health Risk Assessment Guidelines (BAAQMD, 2016). Exposure of nearby sensitive receptors to TACs from project

[4] For a land-use project type, the BAAQMD CEQA Air Quality Guidelines state that a proposed project would result in a less-than-significant impact on localized CO concentrations if the project would not increase traffic at affected intersections to more than 44,000 vehicles per hour.

construction and operation was estimated using the USEPA's AERMOD (atmospheric dispersion modeling system) (USEPA, 2019). Dispersion modeling with the emissions produced by CalEEMod was conducted using AERMOD and hourly meteorological data from the most representative monitoring station to predict TAC and fine particulate matter exposures associated with the proposed project. The cancer risks associated with modeled particulate matter concentrations were computed following the BAAQMD risk management policy guidance.

The BAAQMD has identified a distance of 1,000 feet from the source to the closest sensitive receptor locations within which community health risk thresholds would be applicable to gauge the significance of health risk-related impacts. Impacts are quantified for the maximally impacted sensitive receptors. The 1,000-foot radius used herein is a conservative metric to identify sensitive receptors in the vicinity of the project area. It follows that the impact analysis examines existing baseline conditions and foreseeable future conditions. Therefore, an HRA was conducted in accordance with OEHHA guidance (2015) to estimate the maximum cancer risk resulting from exposure to DPM associated with the proposed project. Refer to Appendix C for further details on the methodology and calculation sheets that show all assumptions used to estimate the cancer risk and chronic hazard index associated with the proposed project.

3.2.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.2-1: The project would not conflict with or obstruct implementation of the applicable air quality plan.	**Construction: Less than Significant** **Operation and Maintenance: Less than Significant**

Construction

The BAAQMD is required, pursuant to the Clean Air Act, to reduce emissions of criteria pollutants for which the SFBAAB is in nonattainment of the CAAQS (i.e., ozone, PM_{10}, and $PM_{2.5}$) and NAAQS (i.e., ozone and $PM_{2.5}$). The most recently adopted air quality plan for the air basin is the 2017 Clean Air Plan. The 2017 Clean Air Plan is a road map that demonstrates how the air basin will achieve compliance with the state ozone standards as expeditiously as practicable and how the region will reduce the transport of ozone and ozone precursors to neighboring air basins. The BAAQMD's 2017 Clean Air Plan contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving the CAAQS and NAAQS. Projects, uses, and activities that are consistent with the applicable growth projections and control strategies used in the development of the Clean Air Plan would not jeopardize attainment of the air quality levels identified in the Clean Air Plan. In determining consistency with the 2017 Clean Air Plan, this analysis considers whether the project would: (1) support the primary goals of the 2017 Clean Air Plan, (2) include applicable control measures from the 2017 Clean Air Plan, and (3) avoid disrupting or hindering implementation of control measures identified in the 2017 Clean Air Plan (BAAQMD, 2017).

The primary goals of the 2017 Clean Air Plan are to: (1) protect air quality and health at the regional and local scale; (2) eliminate disparities among Bay Area communities in cancer health risk from toxic air contaminants; and (3) protect the climate by reducing greenhouse gas emissions. To meet the primary goals, the 2017 Clean Air Plan recommends specific control measures and actions. These control measures are grouped into various categories that include stationary and area source measures, mobile source measures, transportation control measures, land use measures, and energy and climate measures. To this end, the 2017 Clean Air Plan includes 85 control measures aimed at reducing air pollution in the air basin.

Examples of a project that could cause the disruption or delay of the 2017 Clean Air Plan control measures are projects that would preclude the extension of a transit line or bike path, or projects that propose excessive parking beyond parking requirements. Some temporary closures of the pathway along the creek would occur during construction and for up to seven months at Frederick Allen Park, but in the long term, the project would not permanently preclude the extension of a transit line or a bike path or any other transit improvement, nor would it alter the use of surrounding areas. This being the case, construction of the project would not disrupt or hinder implementation of control measures identified in the 2017 Clean Air Plan.

Construction crew members would commute to and from the project site, and heavy equipment would be used during construction of the project. The measures most applicable to the project construction are transportation control measures. The 2017 Clean Air Plan includes several transportation control measures applicable to these activities, including the following:

- Provide incentives to promote ridesharing (TR8).
- Provide incentives to purchase new trucks that exceed NOx emission standards, hybrid trucks, or zero-emission trucks (TR19).
- Deploy construction and farm equipment with Tier 3 or 4 off-road engines (TR22).
- Encourage local governments to adopt tree planting ordinances (NW2).

The applicable transportation control measures are voluntary incentive measures and do not require vehicle upgrades or retrofits. The proposed use of vehicles and equipment, and the proposed tree planting, would not conflict with these programs. Therefore, the project would not conflict with or obstruct implementation of the control measures identified to achieve the goals of the 2017 Clean Air Plan.

Operation of vehicles and equipment during project construction would emit diesel particulate matter and criteria air pollutants. Construction activities, particularly during demolition and grading, would also temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. As further discussed under Impact 3.2-2, no exceedances of the criteria air pollutant significance thresholds would occur, and the project would comply with the requirements of the Clean Construction and Dust Control Ordinances. Therefore, no conflict would occur from exceedance of the criteria air pollutant significance thresholds, and the project would support the primary goals set forth in the 2017 Clean Air Plan. The project's impact with respect to GHGs are discussed in Section 3.7 Greenhouse Gas Emissions, which demonstrates that the project would comply with the 2017 Clean Air Plan.

For the reasons described above, the project construction would not interfere with implementation of the 2017 Clean Air Plan. The project would be consistent with the applicable air quality plan that demonstrates how the region will improve ambient air quality and achieve the state and federal ambient air quality standards. The impact from conflict or obstruction of an applicable air quality plan would be less than significant because the project would be consistent with the applicable air quality plan.

Operation and Maintenance

The 2017 Clean Air Plan does not contain any measures specific to flood control activities and, therefore, no inconsistency with the 2017 Clean Air Plan has been identified. With no specific control measures from the 2017 Clean Air Plan applicable to flood control and management programs, the project would not be considered to hinder implementation of any of the 2017 Clean Air Plan control measures.

Project operation and maintenance would involve activities similar to existing conditions including periodic debris or sediment removal in the creek channel, fish pools and stormwater pump station, vegetation management, and annual routine inspections. A new backup generator would be installed to provide power to the pump station in the event of power failure. One stationary source control measure applies regarding reducing emissions of diesel particulate matter and black carbon from emergency backup generators in accordance with Rule 11-18 (SS32). However, the adopted Rule 11-18 exempts generators used only for emergency use. As further discussed under Impact 3.2-2, no exceedances of the criteria air pollutant significance thresholds would occur. Therefore, no conflict would occur from exceedance of the criteria air pollutant significance thresholds and the project would support the primary goals set forth in the 2017 Clean Air Plan. For the reasons described above, the project would not interfere with implementation of the 2017 Clean Air Plan and the impact would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.2-2: The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Construction activities associated with the project would involve the use of diesel-powered construction equipment, such as graders, excavators, and loaders that would generate exhaust in the form of both criteria air pollutants and criteria air pollutant precursors. In addition, exhaust emissions would be generated from vehicle trips associated with material delivery/debris hauling and commuting workers. Construction activities would also generate fugitive dust (including PM_{10} and $PM_{2.5}$) during excavation, grading, spoils placement, and vehicle travel.

The project design engineer provided information on:

- Duration of each construction phase for each project element;
- Estimated construction equipment requirements for each construction phase for each of the project elements; and
- Estimated number of on-road truck trips for material and equipment delivery, soil off-haul truck trips, water truck trips, and other miscellaneous truck trips.

Construction is assumed to begin in April 2022, with several overlapping phases. Construction of the project is anticipated to take approximately seven months (167 total workdays) at Frederick Allen Park and less time in other areas (refer to Table 2.6-5 and Appendix C for details). Construction-related emissions for each project element is a function of the construction activity involved, including the type, size, and amount of construction equipment used, duration of equipment use, the amount of required auto/light-truck and heavy truck trips, and the average mileage of those trips. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of construction activity, and prevailing weather conditions.

Table 3.2-5 presents unmitigated criteria pollutant emissions generated by construction as compared to the BAAQMD construction thresholds. Refer to Appendix C for the assumptions and calculation sheets that were used to estimate the daily average emissions that would be associated with construction of the proposed project. As shown in the table, emissions would not exceed the BAAQMD thresholds.

In addition to exhaust emissions, emissions of fugitive dust would also be generated by construction activities associated with grading and earth disturbance as well as vehicle travel. The BAAQMD CEQA Air Quality Guidelines requires control of fugitive dust through BMPs in order to consider impacts from fugitive dust emissions less than significant. BAAQMD does not have a quantitative standard for fugitive dust from construction activities. Studies have shown that the application of best management practices (BMPs) at construction sites significantly controls fugitive dust (Countess Environmental, 2006), and individual measures have been shown to reduce fugitive dust by anywhere from 30 to 90 percent (BAAQMD, 2009). The County Development Code includes BAAQMD's fugitive dust Basic Control Measures, but work within Unit 4 and Frederick Allen Park is located within the Town of Ross where the BAAQMD fugitive dust Basic Control Measures have not been adopted into the local regulations.

Table 3.2-5 Estimated Construction Emissions (Pounds)

Unit	Project Element	ROG	NOx	PM_{10} (exhaust)	$PM_{2.5}$ (exhaust)
Unit 4	Fish ladder removal and Unit 4 grading	83	599	23	21
Unit 3	Frederick Allen Park	141	1,269	46	39
	Fish pools	178	1,225	48	46

Unit	Project Element	ROG	NOx	PM_{10} (exhaust)	$PM_{2.5}$ (exhaust)
	Floodwall (Segment #3)	18	170	7	5
	Stormwater pump station	42	338	13	11
	Floodwall (Segment #2)	9	74	3	3
Unit 2	Floodwall (Segment #1)	15	129	6	4
	Lower College of Marin concrete channel removal	82	796	28	23
Total construction emissions		**569**	**4,598**	**174**	**152**
Average daily construction emissions (based on 167 workdays)		**3.4**	**27.5**	**1.0**	**0.9**
BAAQMD significance thresholds		54	54	82	54
Threshold exceeded?		No	No	No	No

Note:
Numbers may not add up due to rounding.

Because the proposed project has not proposed specific dust control measures to comply with BAAQMD CEQA Air Quality Guidelines, the impact associated with fugitive dust emissions in the Town of Ross could be significant. **Mitigation Measure 3.2-2: Fugitive Dust Measures** requires implementation of the BAAQMD's fugitive dust Basic Control Measures, which would meet BAAQMD CEQA Air Quality Guidelines requirements for fugitive dust emissions and reduce impacts to less than significant. The impact from construction emissions would be less than significant with mitigation because emissions would not exceed the BAAQMD thresholds and the mitigation measure would require implementation of the BAAQMD fugitive dust Basic Control Measures across the entire project.

Operation and Maintenance

Following construction, the operation and maintenance of the project elements would be very similar to current management practices in the current creek channel. These activities would involve periodic debris or sediment removal in the creek channel, fish pools and stormwater pump station, vegetation management, and annual routine inspections. The lower Unit 2 restoration would be designed to be a natural and self-maintaining creek ecosystem. No maintenance would be necessary. Vegetation maintenance activities may be slightly higher than existing conditions for a few years after construction to remove invasive weeds and maintain temporary irrigation but in the long term are assumed to be no greater than existing conditions.

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator. The new pump station would house a 40 hp pump powered through an electrical connection to the grid and a 150-kW backup generator in the event of a power outage. The backup generator is

assumed to be tested for 50 hours a year in accordance with the California Code of Regulations limit on annual operation of emergency generators for testing and maintenance (CCR § 93115.6 (3)(A)). Table 3.2-6 presents unmitigated operational criteria air pollutant emissions compared to the BAAQMD operational thresholds. As shown in the table, no emissions would exceed the BAAQMD thresholds. This being the case, operational emissions would not result in exceedance of an air quality standard or contribute substantially to an existing or projected air quality violation and the impact would be less than significant.

Table 3.2-6 Estimated Average Daily Operational Emissions (Pounds/Day)

Unit	Project Element	ROG	NOx	PM_{10}	$PM_{2.5}$
Unit 4	Stormwater pump station	0.05	0.13	0.01	0.01
BAAQMD significance thresholds		54	54	82	54
Threshold exceeded?		No	No	No	No

Note:

The emission calculation conservatively assumed up to 50 hours of operation for testing the backup generator and operation of the 40 hp pumps for up to 365 days a year. Realistically, the pumps would only operate during storm events.

Mitigation: Implement Mitigation Measure 3.2-2.

Mitigation Measure 3.2-2: Fugitive Dust Measures.

To limit dust, criteria pollutants, and precursor emissions associated with construction, the following BAAQMD-recommended fugitive dust control measures shall be implemented and included in all contract specifications for components constructed under the project:

- All exposed surfaces (e.g., unpaved parking areas, unpaved staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- Construction equipment shall be properly maintained by a certified mechanic.

- A publicly visible sign shall be posted with the telephone number and person to contact at the District regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Significance after Mitigation: Mitigation Measure 3.2-2 would require the implementation of BAAQMD's fugitive dust Basic Control Measures, which would reduce fugitive dust emissions during construction to a less-than-significant level.

	Significance Determination
	Construction: Less than Significant with Mitigation
Impact 3.2-3: The project would not expose sensitive receptors to substantial pollutant concentrations.	**Operation and Maintenance: Less than Significant**

Overview

Project construction activities would result in short-term emissions of DPM and other TACs from operation of heavy equipment and vehicles. Operational activities would generate some TAC emissions from the new emergency generator. Impacts on the health of sensitive receptors related to particulate matter are analyzed with other TAC emissions below.

Toxic Air Contaminants

Construction

Construction activities associated with the project would result in the short-term generation of DPM emissions from the use of off-road diesel equipment required to construct the proposed project elements and from construction material deliveries and debris/spoils removal using on-road heavy-duty trucks. Construction activities associated with the project would be transitory and short term in nature, occurring for seven months. Table 3.2-8 presents unmitigated cancer risk, chronic hazard index, and $PM_{2.5}$ exhaust concentrations associated with construction emissions and compares these emissions to the BAAQMD thresholds. Unmitigated construction activities would result in exposure of sensitive receptors to DPM emissions, causing potentially significant health risk impacts. The construction activities conducted in Unit 4 and the northern portion of Unit 3 would pose the greatest health risk because work at this site is surrounded by residential sensitive receptors, with private residential property adjacent to the work area. As shown in Table 3.2-7, cancer risk and maximum acute hazard index exceeds the BAAQMD thresholds, which constitutes a significant impact. The maximum chronic hazard index and annual average $PM_{2.5}$ exhaust concentrations would be less than the BAAQMD's significance thresholds. The short-term health risk impact on sensitive receptors would be potentially significant.

Mitigation Measure 3.2-3: Engine Controls for Construction Equipment requires that all off-road diesel-powered equipment (more than 25 horsepower) used for the project would be

equipped with engines that achieve USEPA Tier 3 and Diesel Particulate Filter level 3 emissions standards. This requirement applies to all phases of construction, with the exception of the Lower College of Marin concrete channel removal due to the lower pollutant concentrations associated with those construction activities and the greater distance between those activities and sensitive receptors. Table 3.2-8 presents a summary of the mitigated health risk at the maximally exposed receptor associated with construction emissions. As shown, the cancer risk, chronic hazard index, and annual average $PM_{2.5}$ exhaust concentrations would be less than the BAAQMD's significance thresholds. Therefore, the impact on sensitive receptors would be reduced to less than significant with mitigation.

Table 3.2-7 Estimated Unmitigated Construction Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally exposed individual receptor[a]	16.5	0.039	--	0.12
Maximally exposed residential receptor[b]	11.9	0.028	59	--
BAAQMD significance thresholds	10.0	1.0	1.0	0.30
Threshold exceeded?	**Yes**	No	**Yes**	No

Notes:

[a] This receptor location is the location where the maximum health risk would occur based on modeling. No real-world sensitive receptors occur at this location.

[b] This receptor location is the nearest real-world sensitive receptor.

Table 3.2-8 Estimated Mitigated Construction Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally exposed individual receptor[a]	4.4	0.010	--	0.03
Maximally exposed residential receptor[b]	3.2	0.007	0.61[c]	--
BAAQMD significance thresholds	10.0	1.0	1.0	0.30
Threshold exceeded?	No	No	No	No

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)

Notes:

[a] This receptor location is the location where the maximum health risk would occur based on modeling. No real-world sensitive receptor occurs at this location.

[b] This receptor location is the nearest real-world sensitive receptor.

[c] The maximally exposed residential receptor is a different residence for acute hazard index with mitigation.

Operation and Maintenance

After construction, maintenance activities would be conducted in the project area. Such activities include vegetation management, sediment and debris removal, and stormwater pump station and floodwall maintenance, which would be similar to existing maintenance activities, resulting in no measurable change in TAC emissions associated with those activities. Operation of the new backup generator during testing and maintenance would generate TAC emissions. Emergency use of the generator is not considered in the analysis. The District would acquire a permit from BAAQMD and comply with permit conditions for the new generator, which could include application of best available control technology and not exceeding 50 hours of testing per year (BAAQMD, 2007; BAAQMD, 2017). The health risk assessment analyzed potential excess lifetime cancer risks and $PM_{2.5}$ concentrations as well as chronic and acute non-cancer health effects resulting from project operation, as shown in Table 3.2-9. As shown, no exceedances of the BAAQMD significance thresholds would occur, and the impact to sensitive receptors would be less than significant.

Table 3.2-9 Estimated Unmitigated Operational Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally exposed individual receptor[a]	0.76	0.0002	0.06	0.001
BAAQMD significance thresholds	10.0	1.0	1.0	0.30
Threshold exceeded?	No	No	No	No

Note:

[a] This receptor location is the location where the maximum health risk would occur based on modeling. No real-world sensitive receptor occurs at this location, but persons may be present during generator testing.

Other Localized Pollutant Concentrations

CO emissions generated from gas-powered truck traffic and other combustion equipment during construction activities could result in CO hotspots, or localized concentrations of CO.

Diesel-powered vehicles and equipment, such as those used for project construction, do not emit CO in the same concentrations and are less likely to cause a CO hotspot. This being the case, congested intersections with a large volume of traffic have the greatest potential to cause high, localized concentrations of CO, which could affect public health. On-road motor vehicle exhaust in metropolitan areas accounts for as much as 75 percent of CO emissions based on data collected across the nation. CO emissions and concentrations have been continually decreasing and have not exceeded the eight-hour federal or state air quality standard at any monitoring location, nationwide,[5] in decades (USEPA, 2017).

The proposed project would generate a relatively small amount of temporary construction traffic and no net new operational traffic. The 2017 CEQA Air Quality Guidelines indicate that a project would significantly affect CO levels if project traffic would increase traffic volumes at intersections to more than 44,000 vehicles per hour. The daily traffic volume at the nearest high-volume road, Sir Francis Drake Boulevard, varies from 22,500 vehicles on the two-lane section between Town of Ross limits and Elm Avenue, to 31,500 vehicles on the four-lane section between Elm Avenue and McAllister Avenue (LSA, 2018). Vehicles used during construction of the proposed project would generate a maximum of 465 one-way truck and worker trips per day (refer to Section 3.13 Transportation and Circulation). Traffic would increase by an average of up to 94 trips (including construction-worker vehicle trips and truck trips) per day during construction of the proposed project and would not cause traffic levels to exceed 44,000 vehicles per hour at any intersection. The other mobile sources associated with the proposed project, such as off-road equipment, would be operated intermittently and in such a manner that CO emissions would not be concentrated in any one area for a long duration. Consequently, construction of the proposed project would not result in CO concentrations in excess of the state or federal health-protective air quality standards in the air basin and, therefore, would not expose sensitive receptors to significant pollutant concentrations that could result in adverse health effects.

Dry Deposition of Particulate Matter

The project area is currently vegetated with trees and channelized along certain portions. No substantial sources of particulate pollution occur within the project area aside from the temporary construction activities and one new emergency generator (refer to the health risk assessment above for the risk associated with these project activities).

Concentrations of particulates due to dry deposition vary depending upon many factors, including wind direction, tree species (due to leaf surface area, density of canopy, and size of canopy), and size of the particle. For example, if vegetation is too dense, the airflow will be impeded and dry deposition will decrease. High concentrations of air pollutants increase dry

[5] U.S. EPA Region 9, which includes California, Nevada, and Arizona, has 28 monitoring locations where CO data is collected.

deposition. This being the case, the best location for vegetation is around the source of the pollutants (Janhäll, 2015). Existing sources of pollution within 300 meters of the project area include permitted stationary sources such as generators and gas stations (refer to Appendix C for a map of permitted sources) as well as roadways such as Sir Francis Drake Boulevard.

Construction of the proposed project would involve removal of up to 144 trees from Frederick Allen Park and up to approximately 225 trees in other areas along the creek, depending on the extent of USACE-required vegetation removal from the existing floodwall and any new floodwalls. The proposed enhancements at Frederick Allen Park also include planting of up to 125 trees and planting with bushes and other types of vegetation that would increase vegetated areas due to the reduction in impervious concrete areas. In addition to on-site planting, urban trees would remain in the project vicinity between nearby residences and the project area. The trees proposed for removal are not surrounding and do not serve as a buffer between a source of air pollutants and sensitive receptors.

While urban vegetation and trees are a tool that can be used to decrease localized levels of particulate matter, ultimately dry deposition has been found to decrease coarse particulate levels by only up to one percent in cities (Nowak, Crane, & Stevens, 2006). Due to the large number of variables that correlate to increases or decreases in concentrations of particulate matter due to dry deposition, the smaller number of trees in the project area would not change concentrations of particulate matter to a degree that could affect the health of sensitive receptors. Impacts on sensitive receptors from changes in concentrations of particulate matter associated with changes in vegetation in the project area would be less than significant.

Mitigation: Implement Mitigation Measure 3.2-3.

Mitigation Measure 3.2-3: Engine Controls for Construction Equipment.

All off-road equipment greater than 25 horsepower that operates for more than 20 total hours over the entire duration of construction activities shall have engines that meet the USEPA or CARB Tier 3 off-road and Diesel Particulate Filter level 3 emission standards or more stringent standards for all phases of construction except the Lower College of Marin concrete channel removal.

Significance after Mitigation: As shown in Table 3.2-8, with implementation of Mitigation Measure 3.2-3, the maximum cancer risk and acute hazard index would be mitigated to below the BAAQMD's significance thresholds, reducing the impact on sensitive receptors to less than significant.

	Significance Determination
Impact 3.2-4: The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

Typical odor sources of concern include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing facilities, fiberglass manufacturing facilities, auto body shops, rendering plants, and coffee roasting facilities. Combustion emissions from the use of diesel fuel in construction equipment could generate localized objectionable odors. If sensitive receptors are located in the immediate vicinity of these activities, odors could be perceivable and constitute a nuisance impact. Construction of the project would take approximately seven months to complete and would take place within the construction hours specified by the applicable local ordinance. Construction equipment and paving activities would not be static and on any given day may take place at different parts of the construction site, which would ensure that receptors are not exposed to odors over the entire duration of the construction period. Any objectionable odors generated by project construction activities and perceived by sensitive receptors would occur on a short-term basis or would be intermittent. A substantial number of people would not be subjected to objectionable odors and the construction-related odor impacts would be less than significant. Further, the stringent idling-time limitations on equipment recommended by the BAAQMD have been incorporated into Mitigation Measure 3.2-2, which would further limit diesel odors generated by construction vehicles.

Operation and Maintenance

Operation of the project would be similar to existing conditions. Project operation and maintenance activities would include sediment and debris removal, vegetation management, and annal inspection. These activities would not emit additional odors above what would otherwise occur under existing maintenance of the flood control channel. The new backup generator could emit some odorous exhaust fumes; however, the generator would be tested for only 50 hours per year. Further, the generator is not directly adjacent to sensitive receptors, and odors dissipate with distance from the source. Therefore, implementation of the project would not cause substantial odorous emission or a substantial increase in the severity of existing odors and the impacts would be less than significant.

Mitigation: None required.

3.2.7 References

BAAQMD. (2001, October 24). *Revised San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard.* Retrieved June 6, 2016, from San Francisco Bay Area Air Quality Management Plans: http://www.arb.ca.gov/planning/sip/planarea/bayareasip.htm

BAAQMD. (2007, July 25). Regulation 9 Inorganic Gaseous Pollutants Rule 8 Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines.

BAAQMD. (2009, October). Revised Draft Options and Justification Report California Environmental Quality Act Thresholds of Significance.

BAAQMD. (2016, January). Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines .

BAAQMD. (2017, April 19). Final 2017 Clean Air Plan: Spare the Air Cool the Climate.

BAAQMD. (2017, December 6). Regulation 2 Permits Rule 2 New Source Review.

BAAQMD. (2017a, April 19). 2017 Clean Air Plan. *Spare the Air Cool the Climate A Blueprint for Clean Air and Climate Protection in the Bay Area*.

BAAQMD. (2017a, May). California Environmental Quality Act Air Quality Guidelines.

BAAQMD. (2017b, January 5). Air Quality Standards and Attainment Status.

BAAQMD. (2019, July 1). 2019 Air Monitoring Network Plan.

BAAQMD. (2019, July 1). 2019 Air Monitoring Network Plan.

BAAQMD. (2019b, August 9). Current Rules. Retrieved January 30, 2020, from https://www.baaqmd.gov/rules-and-compliance/current-rules

California Air Resources Board, Planning and Technical Support Division. (2004). California Air Basins GIS dataset.

CARB. (2009, December). Methodology for Estimating Premature Deaths Associated with Long-Term Exposure to Fine Airborne Particulate Matter in California. *Draft Staff Report*.

CARB. (2011). *CARB Identified Toxic Air Contaminants*.

CARB. (2011, July 18). *Toxic Air Contaminant Identification List*. Retrieved from https://ww3.arb.ca.gov/toxics/id/taclist.htm

CARB. (2016, May 6). Ambient Air Quality Standards.

CARB. (2017). EMFAC Web Database. Retrieved from https://www.arb.ca.gov/emfac/

CARB. (2018). *Trends Summary*. Retrieved from https://www.arb.ca.gov/adam/trends/trendsdisplay.php

CARB. (2018a). *Top 4 Summary*. Retrieved May 5, 2016, from http://www.arb.ca.gov/adam/topfour/topfour1.php

CARB. (2018b). *Trends Summary: State Ozone Statistics. North Central Coast Air Basin*. Retrieved from https://www.arb.ca.gov/adam/trends/trends2.php

CARB. (2020a). *Lead & Health*. Retrieved from https://ww2.arb.ca.gov/resources/lead-and-health

CARB and CAPCOA. (2015). Risk Management Guidance for Stationary Sources of Air Toxics.

Countess Environmental. (2006, September 7). WRAP Fugitive Dust Handbook.

Esri, United States Geological Survey, U.S. Geographic Names Information System. (2020). US Geographic Names Information System GIS datasets.

Federal Register. (2010, December 27). Revisions to Lead Ambient Air Monitoring Requirements . Federal Register Vol. 75, No. 247.

GHD. (2020). Project Elements for the Corte Madera Creek Flood Control Project GIS dataset.

Janhäll, S. (2015). Review on urban vegetation and particle air pollution - Deposition and dispersion. *Atmospheric Environment*, 130-137.

LSA. (2018, March). Sir Francis Drake Boulevard Rehabilitation Project Final EIR Volume.

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

McDonald, R., Kroeger, T., Boucher, T., Longzhu, W., Salem, R., Adams, J., . . . Garg, S. (2016). *Planting Healthy Air: A Global Analysis of the Role of Urban Trees in Addressing Particulate Matter Pollution and Extreme Heat.* Arlington: The Nature Conservancy.

Natural Resources Agency. (2018). Exhibit A Final Statements of Reasons for Regulatory Action Amendments to the State CEQA Guidelines OAL Notice File No. Z-2018-0116-12.

Nowak, D. J., Crane, D. E., & Stevens, J. C. (2006). Air pollution removal by urban trees and shrubs in the United States . *Urban Forestry and Urban Greening*, 115-123.

NRCS. (2017 updated 2019). Soil Survey Geographic Database for Marin County. USDA.

OEHHA. (2015, February). Guidance Manual for Preparation of Health Risk Assessments. *Air Toxics Hot Spots Program Risk Assessment Guidelines*.

Tele Atlas North America, Inc. (2019). U.S. and Canada Detailed Streets GIS dataset. *ESRI® Data & Maps: StreetMap™*. ESRI.

U.S. Census Bureau. (2019, July). QuickFacts. *Monterey County; San Benito County; Santa Cruz County*.

US Geological Survey. (2013). USGS NED 1/3 Arc Second DEM Raster dataset.

USEPA. (2006, November). 13.2.2 Unpaved Roads.

USEPA. (2010, June 2). *Fact Sheet: Revisions to the Primary National Ambient Air Quality Standard, Monitoring Network, and Data Reporting Requirements for Sulfur Dioxide*.

USEPA. (2011, January). 13.2.1 Paved Roads.

USEPA. (2017). Carbon Monoxide Concentrations.

USEPA. (2018a, March 8). *Criteria Air Pollutants*. Retrieved January 20, 2020, from https://www.epa.gov/criteria-air-pollutants

USEPA. (2018b, July 18). *Final Rule for Control of Hazardous Air Pollutants*. Retrieved January 20, 2020

USEPA. (2019, August). User's Guide for the AMS/EPA Regulatory Model (AERMOD) EPA-454/B-19-027.

USGS. (2012). National Hydrography Dataset.

USGS. (2017 updated 2019). Marin County-wide Geology.

WHO. (2012). Arsenic, Metals, Fibres, and Dusts A Review of Human Carcinogens. IARC Monographs - 100C.

3.3 Biological Resources

3.3.1 Introduction

This section includes an evaluation of the potential for the proposed project to result in adverse impacts on biological resources. The section provides an overview of the natural and physical environment and the regulatory setting for the biological resources within the project area. The section also includes discussion of the potential project impacts on biological resources and appropriate mitigation measures, as necessary.

3.3.2 Scoping Comments

Comments related to biological impacts were received during the public scoping process. These comments and the location where they are addressed in the biological resources analysis are provided in Table 3.3-1.

Table 3.3-1 Biological Resources Scoping Comments

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
Charles Goodman	The County must address the removal of over 200 mature trees and how it plans to replace the Park Setting, Privacy, and Habitat Coverage in a timely manner.	Section 3.3.6, Impact 3.3-2
State Lands Commission	For land under the Commission's jurisdiction, the Draft EIR should disclose and analyze all potentially significant effects on sensitive species and habitats in and around the Project area, including special-status wildlife, fish, and plants, and if appropriate, identify feasible mitigation measures to reduce those impacts. The District should conduct queries of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database and U.S. Fish and Wildlife Service's (USFWS) Special Status Species Database to identify any special-status plant or wildlife species that may occur in the Project area. The Draft EIR should also include a discussion of consultation with the CDFW, USFWS, and National Marine Fisheries Service (NMFS) as applicable, including any recommended mitigation measures and potentially required permits identified by these agencies.	Section 3.3.6, Impact 3.3-1
State Lands Commission	Invasive Species: One of the major stressors in California waterways is introduced species. Therefore, the Draft EIR should consider the Project's potential to encourage the establishment or proliferation of aquatic invasive species (AIS) such as the quagga mussel, or other nonindigenous, invasive species including aquatic and terrestrial plants. For example, construction boats and barges brought in from long stays at distant projects may transport new species to the Project area via hull biofouling, wherein marine and aquatic	Section 3.3.6, Impact 3.3-7

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
	organisms attach to and accumulate on the hull and other submerged parts of a vessel. If the analysis in the Draft EIR finds potentially significant AIS impacts, possible mitigation could include contracting vessels and barges from nearby, or requiring contractors to perform a certain degree of hull-cleaning. The CDFW's Invasive Species Program could assist with this analysis as well as with the development of appropriate mitigation (information at https://www.wildlife.ca.gov/Conservation/Invasives).	
State Lands Commission	Construction Noise: The Draft EIR should also evaluate noise and vibration impacts on fish and birds from construction and restoration activities in the water. Mitigation measures could include species-specific work windows as defined by CDFW, USFWS, and NMFS. Again, staff recommends early consultation with these agencies to minimize the impacts of the Project on sensitive species.	Section 3.3.6, Impact 3.3-1
CDFW	Sufficient information regarding the environmental setting is necessary to understand the Project's, and its alternative's (if applicable), significant impacts on the environment (CEQA Guidelines, §§15125 and 15360). CDFW recommends that the CEQA document prepared for the Project provide baseline habitat assessments for special-status plant, fish, and wildlife species located and potentially located within the Project area and surrounding lands, including all rare, threatened, or endangered species (CEQA Guidelines, §15380). Fully protected, threatened or endangered, candidate, and other special-status species that are known to occur, or have the potential to occur in or near the Project site, include, but are not limited to: Coho salmon south of Punta Gorda (*Oncorhynchus kisutch*), state and federally listed as endangered: – California Ridgway's rail (*Rallus obsoletus obsoletus*), state and federally listed as endangered, and a Fully Protected Species – Salt-marsh harvest mouse (*Reithrodontomys raviventris*), state and federally listed as endangered, and a Fully Protected Species – California black rail (*Laterallus jamaicensis coturniculus*), state listed as threatened and a Fully Protected Species – Central California Coast Distinct Population Segment Steelhead (*Oncorhynchus mykiss irideus*), federally listed as threatened – California red-legged frog (*Rana draytonii*), federally listed as threatened and a California Species of Special Concern (SSC) – Foothill yellow-legged frog (*Rana boylii*), SSC – Western pond turtle (*Emys marmorata*), SSC – Pallid bat (*Antrozous pallidus*), SSC – White-tailed kite (*Elanus leucurus*), Fully Protected Species – Napa false indigo (*Amorpha californica* var. *napensis*), California Rare Plant Rank 1B	Section 3.3.3 Environmental Setting and Appendix D (Database Query Results for Special-Status Wildlife and Fish Species in the Project Vicinity)

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
CDFW	Habitat descriptions and species profiles should include information from multiple sources, including: aerial imagery, historical and recent survey data, field reconnaissance, scientific literature and reports, and findings from positive occurrence databases such as the California Natural Diversity Database (CNDDB). Based on the data and information from the habitat assessment, the CEQA document can then adequately assess which special-status species are likely to occur in the Project vicinity.	Section 3.3.3 Environmental Setting
CDFW	CDFW recommends that prior to Project implementation, surveys be conducted for special-status species with potential to occur, following recommended survey protocols if available. Survey and monitoring protocols and guidelines are available at: https://www.wildlife.ca.gov/Conservation/Survey-Protocol.	Section 3.3.3 Environmental Setting. Protocol-level surveys were not conducted for this CEQA analysis; habitat associations and ranges of each special-status species were compared with existing habitat conditions in the project area; for some species (e.g., salt marsh harvest mouse and Ridgway's rail), presence was assumed.
CDFW	Botanical surveys for special-status plant species, including those with a California Rare Plant Rank (http://www.cnps.org/cnps/rareplants/inventory/), must be conducted during the blooming period for all sensitive plant species potentially occurring within the Project area and require the identification of reference populations. Please refer to CDFW protocols for surveying and evaluating impacts to rare plants available at: https://www.wildlife.ca.gov/Conservation/Plants.	Section 3.3.3 Environmental Setting and Section 3.3.6, Impact 3.3-1
CDFW	The Project takes place along an urbanized corridor of Corte Madera Creek with residential, business, and community structures developed near the creek. The upstream segments of the Project provide freshwater habitat and a riparian corridor composed mostly of hardwood trees (CDFW 2009). The farthest downstream segment of the Project is tidally influenced and transitions to tidal wetland with fewer riparian trees. Corte Madera Creek is designated critical habitat for the state and federally listed as endangered Coho salmon South of Punta Gorda and the federally listed as threatened Central California Coast Distinct Population Segment Steelhead. Corte Madera Creek is also designated essential fish habitat for various life stages of salmon.	Section 3.3.3 Environmental Setting

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
	Steelhead are present in the creek and Coho have historically utilized the watershed.	
CDFW	The CEQA Guidelines (§15126.2) necessitate that the draft EIR discuss all direct and indirect impacts (temporary and permanent) that may occur with implementation of the Project. This includes evaluating and describing impacts such as: – Potential for "take" of special-status species – Loss or modification of breeding, nesting, dispersal and foraging habitat, including vegetation removal, alteration of soils and hydrology, and removal of habitat structural features (e.g. snags, roosts, overhanging banks) – Permanent and temporary habitat disturbances associated with ground disturbance, noise, lighting, reflection, air pollution, traffic or human presence – Obstruction of movement corridors, fish passage, or access to water sources and other core habitat features	Section 3.3.6 Impact Discussion
CDFW	Based on the comprehensive analysis of the direct, indirect, and cumulative impacts of the Project, the CEQA Guidelines (§§ 15021, 15063, 15071, 15126.2, 15126.4 and 15370) direct the lead agency to consider and describe all feasible mitigation measures to avoid potentially significant impacts in the draft EIR, and/or mitigate significant impacts of the Project on the environment. This includes a discussion of take avoidance and minimization measures for special-status species, which are recommended to be developed in early consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and CDFW. These measures can then be incorporated as enforceable Project conditions to reduce potential impacts to biological resources to less-than-significant levels. Fully protected species such as California Ridgway's rail, California black rail, and salt marsh harvest mouse, may not be taken or possessed at any time (Fish and Game Code § 3511). Therefore, the draft EIR is advised to include measures to ensure complete take avoidance of these fully protected species.	Section 3.3.6 Mitigation Measures
CDFW	Tree replacement ratios provided by CDFW: Oak trees: – 4:1 replacement for trees 5 to 10 inches diameter at breast height (DBH) – 5:1 replacement for trees greater than 10 inches to 15 inches DBH – 15:1 replacement for trees greater than 15 inches DBH, which are considered old-growth oaks. Replacement oaks will come from nursery stock grown from locally sourced acorns, or from acorns gathered locally, preferably from the same watershed in which they are planted.	Section 3.3.6, Impact 3.3-2

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
CDFW	Other tree species greater than or equal to 6 inches DBH will be mitigated at the following ratios: – 1:1 replacement for non-native trees – 3:1 replacement for native trees	Section 3.3.6, Impact 3.3-2
CDFW	The Project area should be revegetated and restored within the same season as construction following a Restoration Plan accepted in writing by CDFW. CDFW recommends habitat mapping and tree surveys be conducted to refine potential impacts prior to submitting the Restoration Plan. CDFW is available to work with the County to determine an appropriate offsite planting location as well.	Section 3.3.3 Environmental Setting and Section 3.3.6, Impact 3.3-2
CDFW	Both the on-site and potentially off-site Restoration Plan should monitor and maintain, as necessary, all plants for a minimum of ten (10) years to ensure successful revegetation. Planted trees and other vegetation should each have a minimum of 85 percent survival at the end of five years. If revegetation survival and/or cover requirements do not meet established goals, replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements should occur. Replacement plants should be monitored with the same survival and growth requirements for five years after planting.	Section 3.3.6, Impact 3.3-2
CDFW (Gregg Erickson)	Any proposed regrading in the draft EIR should assess impacts, and at a minimum, be designed to maintain existing year-round instream habitat. The analysis should include the geomorphology of the creek upstream of the bypass outlet. CDFW recommends a critical riffle analysis utilizing CDFW's Standard Operating Procedure for Critical Riffle Analysis for Fish Passage in California. This may include addressing fish passage design criteria, sediment transport, design storm elevations, scour potential, and shear stress involved in the bypass structure.	The bypass outlet was part of the original USACE project and is no longer being proposed. The re-grading in Unit 4 and potentially adjacent to FAP is designed to maintain and expand year-round instream habitat.
Town of Ross	• Number of trees and species to be removed and replanted in Frederick Allen Park and within the overall Riparian Corridor. • The impacts related to the lack of shade and habitat during the initial years of growth of younger replacement trees including at completion of construction, at 5 years after, and at 10 years after construction.	Section 3.3.6, Impact 3.3-2
Marin Audubon Society	What are the potential impacts of the steps to fish and birds attempting to feed or rest in the creek? We are concerned that use of the steps would result in the creek waters in the vicinity being reduced in habitat value for wildlife, particularly birds. Usually more wildlife can be viewed from further away, i.e. from the trail on the top	Section 3.3.6, Impact 3.3-1

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
	of the bank. Many studies have confirmed that wildlife leave when humans come close, and we would expect that would occur here.	
Garril Page	All along the creeks and roads, Ross' trees reduce pollution, store carbon, help control storm water, reduce noise and raise property values. Trees promote biodiversity: plants, birds, insects, small animals and microscopic soil dwellers thrive under the tree canopy. Root systems of mature alders and willows in creek bank toes and along walls create stability. The native oaks and redwoods resist wildfire and provide shade and cool water for creeks. These attributes exist; they must be valued proportionately and weighed against the odds of an improbable return of endangered, extirpated coho, the small number of observed migratory salmon and trout, the ecological disturbances resulting from the FAP proposal's expanded development and habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition and lessened quality of life for residents.	Section 3.3.6, Impact 3.3-2
Garril Page	Ross public life centers around the Post Office, The Common, Ross School, and the commercial area. If the FAP Riparian Corridor Project creates pools of still water, bats and other insect-eaters become an even more important resource. Residences along Ross' creeks benefit from bats and insect predators. The proposed extent and duration of the FAP Riparian Corridor project will result in disturbance of roosts and habitat, and adversely affect enjoyment of exterior areas throughout Ross. Wildlife displaced by the project may never return to the denuded habitat.	Section 3.3.6, Impact 3.3-1
Garril Page	Excessive tree removal proposed for FAP Riparian Corridor creates ecological disturbances, expanded development, habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition where planned riparian growth may be more susceptible to wildfire.	Section 3.3.6, Impact 3.3-1

3.3.3 Environmental Setting

Methods

The greater Ross Valley area supports many special-status species. Database searches of CDFW's CNDDB (CDFW, 2020a), CNPS's online Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2020a), USFWS's iPaC tool (USFWS, 2020), and NMFS's California Species List were conducted to generate lists of special-status species, sensitive natural communities, and designated critical habitats documented to occur in the vicinity of the project area. The database queries were based on a search of the USGS 7.5-minute quadrangle in which the project is located (San Rafael) and the surrounding eight quadrangles (Bolinas, San Geronimo, Novato, Petaluma Point, San Quentin, San Francisco North, Hunters Point, and

Point Bonita), collectively referred to as the "project vicinity." The resulting lists of special-status species and sensitive natural communities with potential to occur in the project vicinity are provided in Appendix D, including special-status species without the potential to occur in the study area because suitable habitat is not present or the study area is outside the species range.

In addition to the database queries described above, the following information sources were also reviewed:

- Aerial imagery (e.g., Google Earth)
- Historical and recent field reconnaissance and survey data
- USFWS species profiles, species recovery plans, and five-year species reviews
- Scientific research and/or peer-reviewed journal articles
- Unpublished reports
- Citizen science databases including eBird (2020) and iNaturalist (2020) (research-grade records)

Stillwater Sciences reviewed the database query results and then conducted reconnaissance-level biological surveys for botanical, fisheries, and wildlife resources as well as a field delineation of wetlands and waters of the U.S. within the project area on July 15, 2020. The survey extended from approximately 480 feet upstream of Unit 4 and down to the wetland downstream of Unit 2.

The database query results, information collected during the field reconnaissance and other information sources, and the habitat preferences and distributional range of each special-status species were compared with existing habitat conditions and species distribution in the project area. This comparison allowed for a determination of likelihood of each special-status species identified from the database queries to occur in the project area. This analysis resulted in the following categories of the likelihood for a special-status species to occur in or near the project area:

- *None* (no potential to occur): The project area is outside of the species' known distribution or elevation range and/or the species' required habitat is lacking from the project area.
- *Low* (not expected to occur): The species' known distribution or elevation range overlaps with the project area, and the species' required habitat is of very low quality or quantity in the project area; suitable key habitat or habitat elements may be present but may be of poor quality or isolated from the nearest extant occurrences.
- *Moderate* (may possibly occur): The species' known distribution or elevation range overlaps with the project area, and the species' required habitat occurs in the project area.
- *High* (present): The species has been documented in the project area and/or its required habitat occurs in the project area and is of high quality.

Regional Setting

The project is located in Marin County in the San Francisco Bay Area, a floristic subregion of the California Floristic Province's Central Western California region, which contains a diverse assemblage of plant communities and wildlife habitat types. Marin County is located between the Pacific Ocean and San Francisco Bay in California's Coast Range. Elevations range from sea level up to 2,572 feet at the summit of Mount Tamalpais. Marin County has a mild Mediterranean climate with long dry summers and rainy winters; rainfall averages from 30 to 61 inches per year (Marin County Community Development Agency, 2004). Coastal fog is common, especially in late summer when it provides an important source of moisture for local plants and animals.

Approximately 50 percent of the land area in Marin County is under public management as parks, open space, conservation easements, and watershed lands. Most developed areas are in the eastern part of the county, between the San Francisco Bay and Mount Tamalpais. Natural community types in the county include mixed evergreen forest, oak woodland, pine forest, Douglas fir/redwood forest, grassland, coastal beach dune, northern coastal scrub, chaparral, coastal salt marsh, riparian, and freshwater marsh. These communities support a wide range of plant and animal species, including special-status species (Marin County Community Development Agency , 2007). Vegetation communities in Marin have been altered by agriculture, livestock grazing, timber operations, road building, and urban and suburban development beginning in the nineteenth century. Native perennial grasslands have been mostly replaced by non-native annual grassland, and invasive species now have widespread distribution. Marshlands have been filled and developed and creeks narrowed, culverted, and incised. Urban and suburban development have contributed to considerable fragmentation of the remaining natural areas and limited the available floodplain for creek systems (Marin County Community Development Agency , 2007).

Project Setting

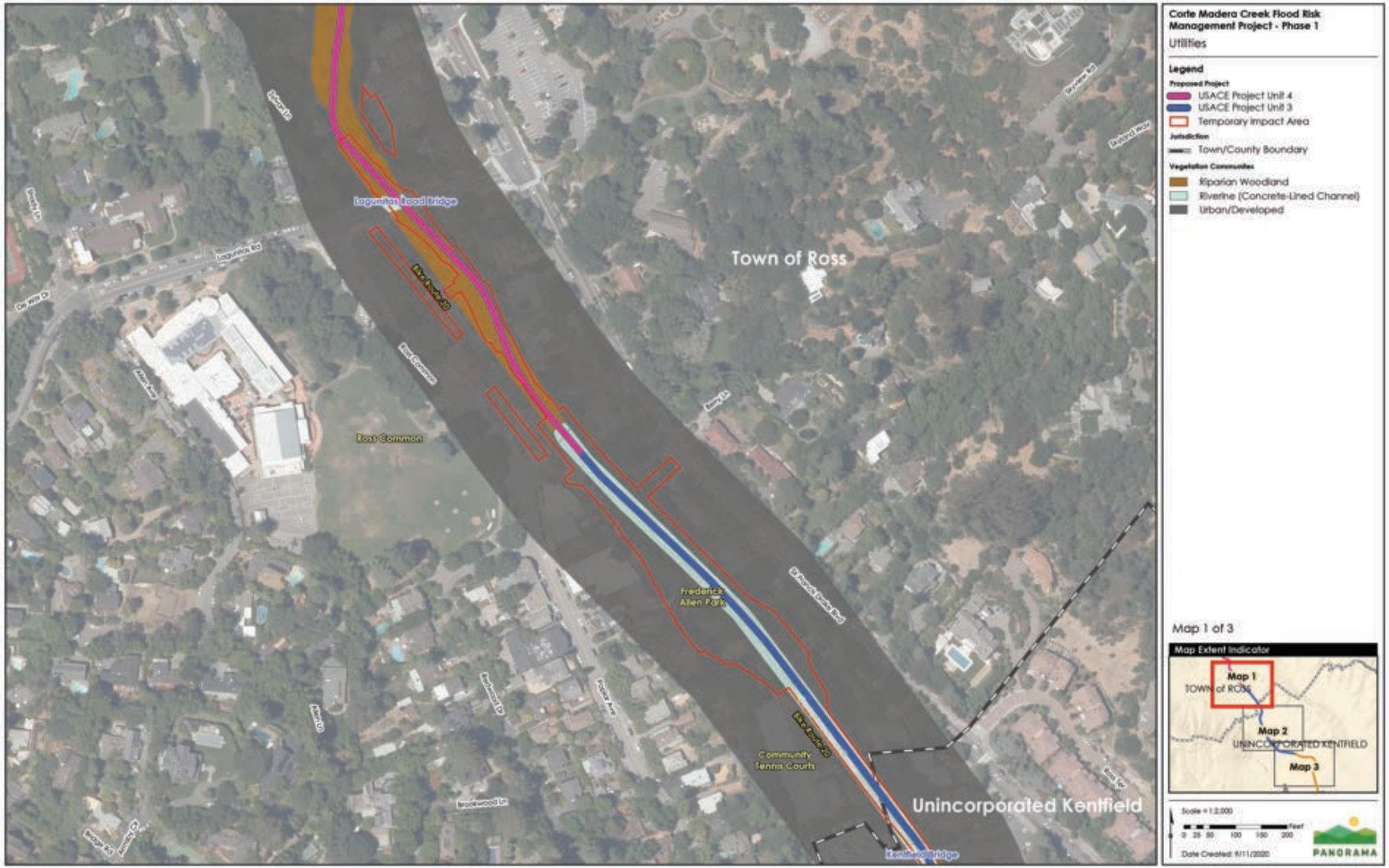
Water flow in Corte Madera Creek is highest in early January and lowest from July through September, when flowing water is uncommon and the stream is predominantly dry (Town of Ross, 2009, in USACE 2010). Water flow during the site visit and delineation was approximately 0.84 cubic feet per second (cfs) as recorded at the U.S. Geological Survey (USGS) Ross gage.

Vegetation Communities and Wetlands

The project area contains three vegetation communities/habitat types: riparian woodland within the natural channel of Unit 4 and, at the downstream end of the project within Unit 2, coastal brackish marsh and acacia woodland (Table 3.3-2; Figure 3.3-1 through Figure 3.3-3) (Atkins North America, Inc., 2011). Unvegetated types found throughout the project area include riverine (both concrete-lined and earthen-lined) as well as urban or developed areas.

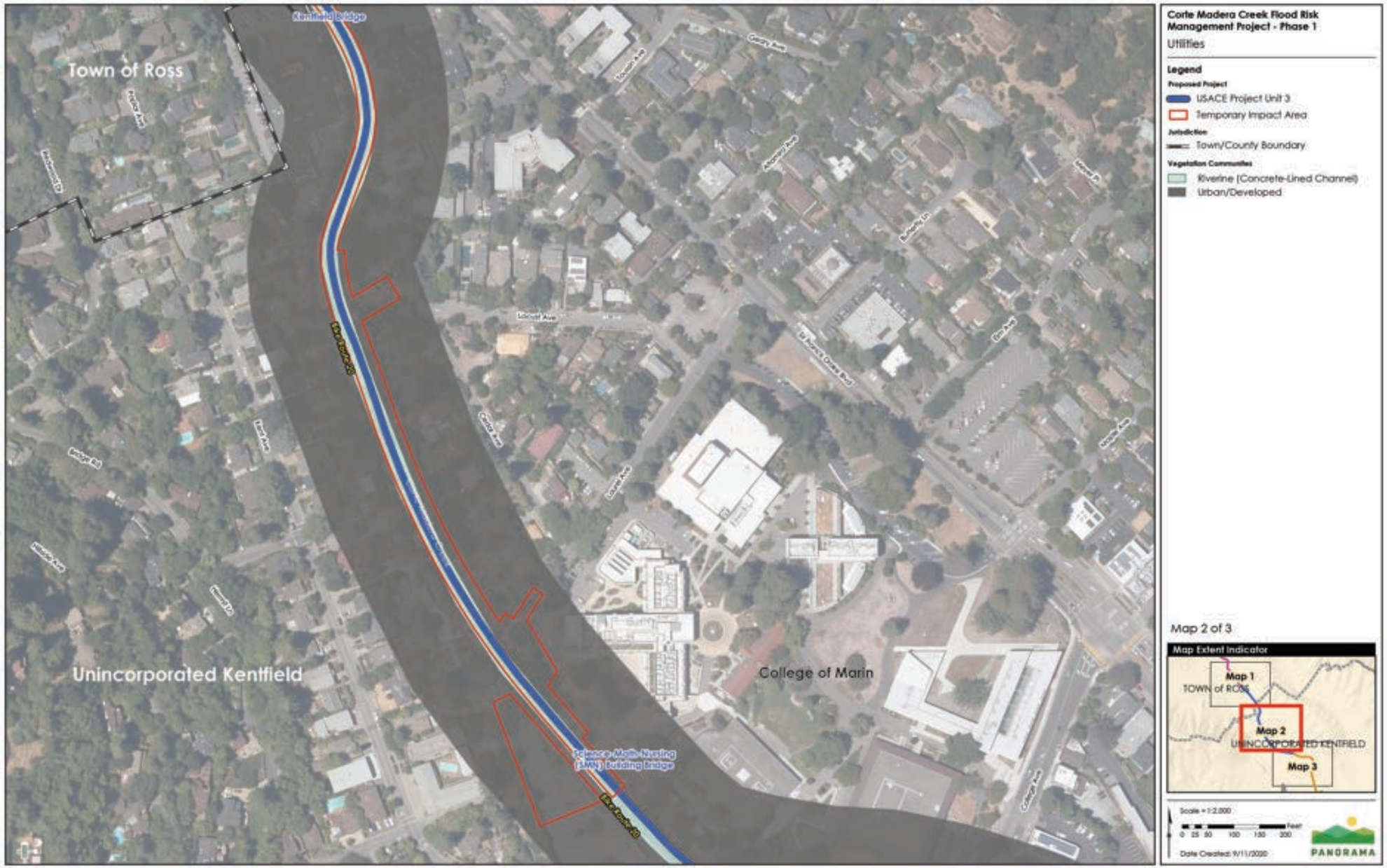
Both nontidal waters and tidal waters were delineated in the project area during a preliminary jurisdictional delineation in July 2020 (Stillwater Sciences, 2020). No wetlands were identified outside of areas delineated as waters (i.e., no wetlands were documented above the ordinary high-water mark or, in tidal areas, above the high-tide line); however, areas mapped as waters included vegetated areas within the channel.

Figure 3.3-1 Habitat Types within Project Area (Map 1 of 3)



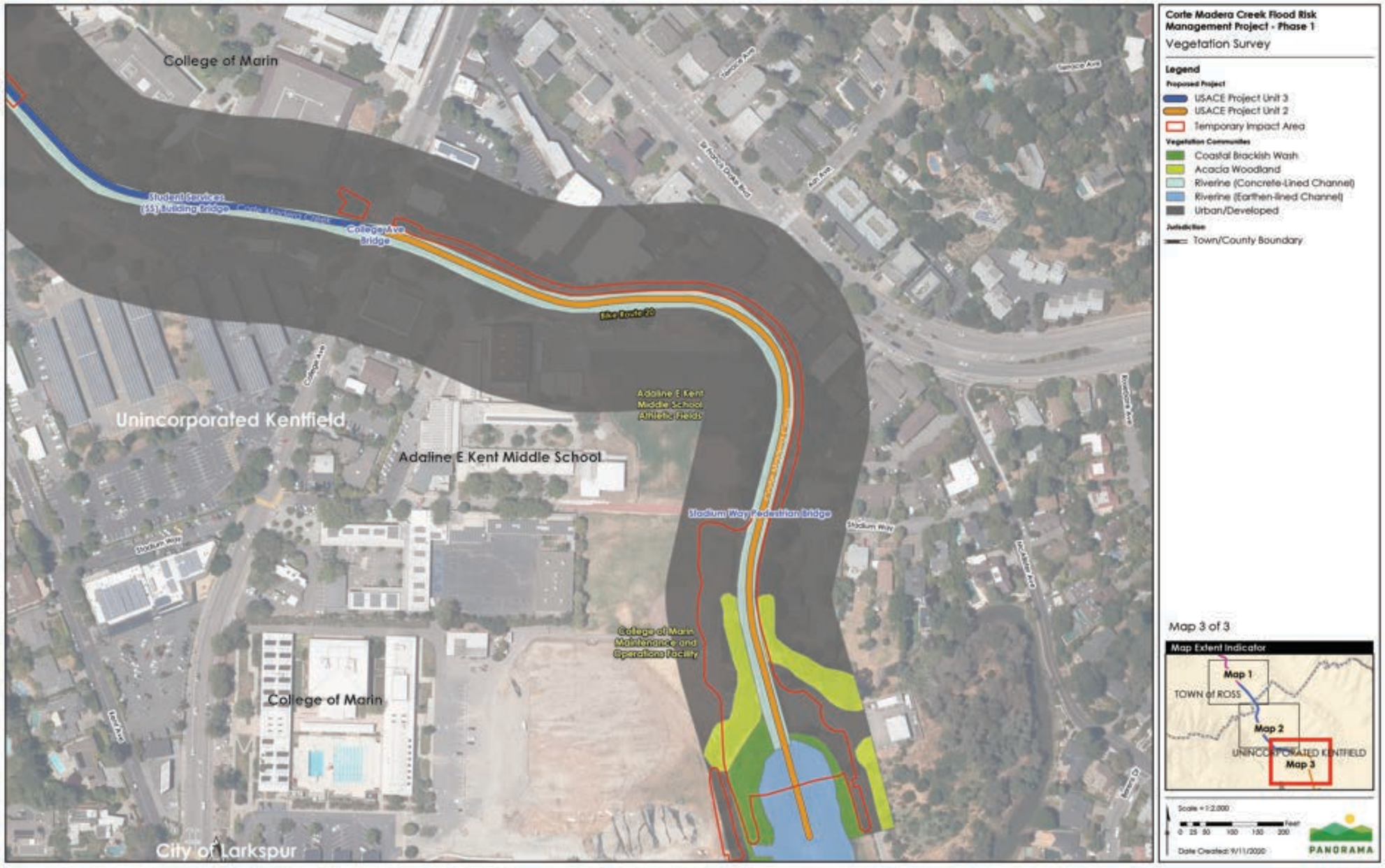
Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, GHD 2020, US Geological Survey 2013)

Figure 3.3-2 Habitat Types within Project Area (Map 2 of 3)



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, GHD 2020, US Geological Survey 2013)

Figure 3.3-3 Habitat Types within Project Area (Map 3 of 3)



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, GHD 2020, US Geological Survey 2013)

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Table 3.3-2 Habitat Types within Project Area (acres)

Habitat Type	Unit 2	Unit 3	Unit 4
Coastal brackish marsh	0.23	--	--
Acacia woodland	0.42	--	--
Riparian woodland	--	--	0.55
Riverine (concrete-lined)	0.37	0.56	--
Riverine (earthen-lined)	0.22	--	0.15
Urban/developed	0.98	1.48	0.44

Coastal Brackish Marsh

Coastal brackish marsh habitat is an intertidal emergent wetland community dominated by grasses, forbs, and shrubs that are tolerant of salinities ranging from slight to moderate (0.5 to 18 ppt [parts per thousand] salt). Coastal brackish marsh habitat occurs in Unit 2 at the downstream end of the project area. Dominant species observed included tuberous bulrushes (*Bolboschoenus* spp.), pickleweed (*Salicornia pacifica*), alkali Russian thistle (*Salsola soda*), and cord grass species (*Spartina* spp.). The coastal brackish marsh may contain sensitive natural communities.

Acacia Woodland

Acacia woodland habitat with some eucalyptus trees occurs in Unit 2 of the project area. Dominant species observed include silver waddle (*Acacia dealbata*) and a few red gum (*Eucalyptus camaldulensis*) trees.

Riparian Woodland

The primary vegetation community in Unit 4 upstream of the existing Denil fish ladder is riparian woodland. This habitat includes the earthen streambed channel of Corte Madera Creek. No riparian woodland habitat exists in the project area downstream of the fish ladder in Units 2 and 3. Canopy cover within the riparian community ranges from 50 to 100 percent throughout Unit 4. Dominant species in the overstory include box elder (*Acer negundo*), silver waddle, big leaf maple (*Acer macrophyllum*), arroyo willow (*Salix lasiolepis*), blue gum (*Eucalyptus globulus*), Oregon ash (*Fraxinus latifolia*), redwood (*Sequoia sempervirens*), and white alder (*Alnus rhombifolia*). Species observed in the understory included Himalayan blackberry (*Rubus armeniacus*), periwinkle (*Vinca major*), English ivy (*Hedera helix*), cape ivy (*Delairea odorata*), French broom (*Genista monspessulana*), dotted smartweed (*Persicaria punctata*), poison oak (*Toxicodendron diversilobum*), and California man-root (*Marah fabaceus*).

Riparian woodland is a structurally complex and productive terrestrial community that forms a closed canopy of mature trees within and adjacent to rivers, creeks, and streams and provides a variety of wildlife species with abundant food, cover, and nesting habitat. Riparian woodland communities are natural vegetation communities that occur in association with streams. Throughout California, over 135 bird species alone depend on riparian habitat for all or a

portion of their lives. Because of the value and scarcity of riparian woodlands, on both a state and region-wide scale, they are considered a sensitive habitat type and monitored by the CDFW. The riparian woodland of Unit 4 is somewhat fragmented by encroaching urbanization, including residential and commercial development, bridges, and landscaping vegetation.

Riverine (concrete-lined channel)
Riverine (concrete-lined channel) habitat in the project area consists of the USACE flood control channel that extends from the fish ladder downstream to Kent Middle School for approximately 4,900 feet. The channel has vertical walls, with a 33-foot-wide concrete streambed with a V-shaped thalweg in the center to concentrate low flows. From Unit 3 to the downstream end of the project, the concrete channels restrict establishment of riparian vegetation. Trees remain along the creek outside of the concrete walls but are often landscaping trees installed as part of urban development. The riverine vegetation in Units 2 and 3 of the project area is sparse, often weedy and non-native, and provides little quality habitat or shade to the creek.

Riverine (earthen-lined channel)
Riverine (earthen-lined channel) habitat includes open-water areas and closely associated vegetation that occur within a defined channel of a stream. Riverine habitat is generally bounded on the landward side by upland vegetation or channel bank. Riverine (earthen-lined channel) habitat within the project area is located in the natural channel of Unit 4 and a small portion of Unit 2 at the downstream end of the project area.

Urban/developed
Urban/developed habitat includes both landscape vegetation (i.e., ornamental plantings) and non-permeable non-vegetated infrastructure such as buildings, roads, trails, and other infrastructure. Landscape vegetation is found in areas of development associated with the Town of Ross Post Office, Town of Ross Police Station, Frederick Allen Park, residential backyards, Kentfield Hospital, and the College of Marin.

Vegetation associated with landscaping consists predominantly of nonnative tree species and includes Chinese pistache (*Pistacia chinensis* subsp. *falcata*), glossy privet (*Ligustrum lucidum*), English elm (*Ulmus minor*), weeping willow (*Salix babylonica*), Monterey pine (*Pinus radiata*), oleander (*Nerium oleander*), honeysuckle (*Lonicera* sp.), cork oak (*Quercus suber*), wisteria (*Wisteria sinensis*), wild plum (*Prunus* sp.), ornamental rose (*Rosa* sp.), and Mexican fan palm (*Washingtonia robusta*). This vegetation is present sporadically along the top of the vertical concrete channel walls and provides limited shade to the creek.

At Frederick Allen Park, areas mapped as landscaped vegetation (Atkins North America, Inc., 2011) includes a mix of native and nonnative landscape trees, of which approximately 69 percent were considered to be in good or excellent condition (i.e., little or no existing disease or damage in canopy or roots), 30 percent were in fair or marginal condition (i.e., minor existing disease or damage in canopy or roots), and 1 percent were either in poor condition (i.e., major existing disease or damage in canopy or root) or presented a hazard to a building and/or structure (GHD 2020). Two-thirds of the trees southeast of the bike path—which includes the

majority of the park set back from the creek—are nonnative tree species and include Norway maple (*Acer platanoides*), southern magnolia (*Magnolia grandiflora*), Chinese pistache, American plum (*Prunus americana*), and English elm. The remaining one-third of the trees southeast of the bike path are native trees and include California buckeye (*Aesculus californica*), coast live oak (*Quercus agrifolia*), and valley oak (*Quercus lobata*). Trees northeast of the bike path and adjacent to the creek are predominantly native trees (i.e., 17 out of 21 trees) and include California buckeye, coast live oak, and valley oak with a few nonnative trees present (Monterey cypress [*Hesperocyparis macrocarpa*] and Monterey pine). Although Frederick Allen Park is mapped as urban/developed, due to its proximity to the creek, CDFW may consider all or a portion of the park to be within the riparian zone.

Fish

In 2000, A.A. Rich and Associates conducted field surveys of the Corte Madera Creek watershed to describe the flows, instream habitat, and fishes of Corte Madera Creek and its tributaries. These surveys collected the following five fish species from the Corte Madera Creek watershed: rainbow trout/Steelhead (*Oncorphynchus mykiss*), threespine stickleback (*Gasterosteus aculeatus*), California roach (*Hesperoleucus symmetricus*), sculpin (*Cottus* sp.), and Sacramento sucker (*Catostomus occidentalis*) (A. A. Rich and Associates, 2000). Stillwater Sciences observed rainbow trout/Steelhead, threespine stickleback, California roach, and Sacramento sucker during their field review on July 15, 2020. The A. A. Rich (2000) report also identified the limiting factors for rainbow Steelhead production in the Corte Madera Creek watershed as being the lack of stream flows and high water temperatures, depending on the creek and the reach location within the creek.

Historically, Corte Madera Creek supported tidewater goby (*Eucyclogobius newberryi*) in the estuary near its mouth, but Leidy (1984) reported that the last time this fish was collected from this locality was in 1958 and believed the tidewater goby was probably extirpated in this area. Corte Madera Creek also historically supported a population of the anadromous salmonid, coho salmon (*Oncorhynchus kisutch*), but the last report of a fisheries survey finding the juveniles of this salmon species in this creek was in 1984 (Leidy & Leidy., 1984; Leidy, Becker, & Harvey., 2005)(Leidy 1984; Leidy 2005). Though not historically present in Corte Madera Creek, another anadromous salmonid, adult Chinook salmon (*Oncorhynchus tshawytscha*), have been reported observed in the creek (Love, 2007). Straying of hatchery-origin chinook salmon to small and medium tributaries to the San Francisco Bay estuary increased greatly once CDFW began trucking salmon smolt downstream of the Sacramento-San Joaquin River Delta and releasing these smolts at Benicia to avoid excessive predation. Chinook salmon do not have a viable self-sustaining population in Corte Madera Creek.

Beginning in late May and extending through September, water temperatures are high (65 to 75 degrees Fahrenheit) in the concrete flood control channel (A. A. Rich and Associates, 2000). Stillwater Sciences recorded a water temperature of 73.4 degrees Fahrenheit on July 15, 2020, at noon. These water temperatures are stressful to any Steelhead or coho salmon in the area during spring and summer months and may be lethal during the smoltification/emigration and rearing life stages of Steelhead. Based on 1999 data, adult Steelhead migrating through the

channel after mid-April could encounter stressful thermal conditions. Similarly, if the parr-to-smolt transformation is not complete by the end of April, there could be thermal stress, beginning in May. For rearing Steelhead, summer water temperatures in the concrete channel are stressful to potentially lethal, beginning in June and extending through September.

Healthy water temperatures for Steelhead range from 54 to 64 degrees Fahrenheit for the spawning, incubation, fry emergence, rearing, and adult life stages (A. A. Rich and Associates, 2000). Upstream of the concrete-lined flood control channel, water temperatures during fry and juvenile rearing begin to approach stressful levels in June. The upstream areas of Corte Madera Creek consist of long lateral scour pools alternating with riffle areas and a riparian canopy, which, along with subsurface flow, help keep the water temperatures cooler. Stillwater Sciences recorded a water temperature of 64.4 degrees Fahrenheit at 10 a.m. on July 15, 2020, in Unit 4.

CDFW (2010) conducted a stream habitat inventory within a 3,336-foot-long reach extending from the Kentfield Hospital Bridge upstream to the mouth of Ross Creek, of which 995 feet located between the fish ladder and bridge was concrete channel. The pool, riffle, and flatwater percentages by length of stream upstream of the concrete channel were 10.5, 5., and 55 percent, respectively. CDFW (2010) also recorded approximately 27 percent of the creek length being dry and 2 percent consisting of the fish ladder. Three pools were measured in the 2,341-foot-long reach upstream of the fish ladder (CDFW, 2010). The average maximum pool depth throughout the survey reach was 3.2 feet.

Flow during the reconnaissance survey on July 15, 2020 was 0.8 cfs, as recorded at the USGS Ross gage (#11460000). The pool, riffle, and flatwater percentages by length of stream along 1,183 feet of natural channel upstream of the fish ladder was 46, 19. and 35 percent, respectively. There were four pools within the Unit 4 survey reach, with maximum depths ranging from 2.3 to 4.3 feet. The substrate was primarily composed of gravel, with sand and cobble being subdominant.

Wildlife

The Corte Madera Creek watershed supports a relatively diverse assemblage of invertebrate, amphibian, reptile, bird, and mammal species. The overall quality of wildlife habitat within the project area is compromised by the concrete-lined channel in the majority of the project area, the proximity to human disturbance, fragmentation of the riparian woodland, density of nonnative vegetation, and lack of available food and escape cover. However, portions of the study area, especially within the natural creek bed segment (Unit 4) and in the coastal brackish marsh at the downstream end of the project area (Unit 2), provide value to wildlife and serve valuable habitat functions by offering wildlife species refuge from urban development.

Wildlife species or sign observed during the July 15, 2020, reconnaissance survey included the following: Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), black-crowned night heron (*Nycticorax nycticorax*), turkey vulture (*Cathartes aura*), red-shouldered hawk (*Buteo lineatus*), killdeer (*Charadrius vociferus*), lesser yellowlegs (*Tringa flavipes*), Anna's hummingbird (*Calypte anna*), Nuttall's woodpecker (*Picoides nuttallii*), Pacific slope flycatcher (*Empidonax*

difficilis), black phoebe (*Sayornis nigricans*), American crow (*Corvus brachyrhynchos*), swallow (sp.) (*Tachycineta* sp.), chestnut-backed chickadee (*Poecile rufescens*), Wilson's warbler (*Cardellina pusilla*), spotted towhee (*Pipilo maculatus*), song sparrow (*Melospiza melodia*), dark-eyed junco (*Junco hyemalis*), hooded oriole (*Icterus cucullatus*), house sparrow (*Passer domesticus*), racoon (scat) (*Procyon lotor*), river otter (scat) (*Lontra canadensis*), and black-tailed deer (scat) (*Odocoileus hemionus*).

Invertebrates

Insects observed in the watershed have included water striders, water scorpions, giant water bugs, water boatmen, water bugs (*Naucoridia* and *Dytiscidae*), diving beetles, whirligigs, Dobson fly larvae, caddis fly larvae, damselfly nymphs, dragonfly nymphs, mayfly nymphs, mosquitoes, gnats, and black flies (USACE, 1987, in Friends of Corte Madera Watershed, 2004). Crayfish are commonly observed in the freshwater reaches of the creek (Friends of Corte Madera Watershed, 2004) and were observed during the field reconnaissance on July 15, 2020.

Amphibians and Reptiles

Riverine habitats with a native streambed and adjacent upland vegetation provide suitable habitat for amphibian and reptiles, particularly within and adjacent to Unit 4 of Corte Madera Creek. Amphibians documented in the greater watershed have included California newt (*Taricha torosa*) and California giant salamander (*Dicamptodon ensatus*). The adjoining woodlands, forests and grasslands also support arboreal salamander (*Aneides lugubris*), California slender salamander, yellow-eyed salamander (*Ensatina eschscholtzii xanthoptica*), and Sierran treefrog (*Pseudacris sierrae*). Reptiles in the project area may include western fence lizard, Pacific gopher snake, ringneck snake (*Diadophis punctatus*), sharp-tailed snake (*Contia tenuis*), and California kingsnake (*Lampropeltis californiae*), among others.

Birds

Wildlife Marin Audubon Society ~~Friends of Corte Madera Creek Watershed has~~ conducted ~~Christmas Bird Counts~~ bird counts along Corte Madera Creek from 1978 to 2019 ~~2003~~. Common bird species observed during these surveys included: black-crowned night heron, snowy egret (*Egretta thula*), great egret (*Ardea alba*), green heron (*Butorides virescens*), great blue heron (*Ardea herodias*), pied-billed grebe (*Podilymbus podiceps*), western grebe (*Aechmophorus occidentalis*), double-crested cormorant (*Phalacrocorax auritus*), turkey vulture (*Cathartes aura*), Canada goose, American wigeon (*Anas americana*), green-winged teal (*Anas crecca*), canvasback (*Aythya valisineria*), greater scaup (*Aythya marila*), lesser scaup (*Aythya affinis*), bufflehead (*Bucephala albeola*), common goldeneye *Bucephala clangula*), hooded merganser (*Lophodytes cucullatus*), ruddy duck (*Oxyura jamaicensis*), osprey (*Pandion haliaetus*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk, American kestrel (*Falco sparverius*), American coot (*Fulica americana*), killdeer, black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), greater yellowlegs (*Tringa melanoleuca*), willet (*Catoptrophorus semipalmatus*), least sandpiper (*Calidris minutilla*), ring-billed gull (*Larus delawarensis*), California gull (*Larus californicus*), herring gull (*Larus argentatus*), western gull (*Larus occidentalis*), rock pigeon (*Columbia livia*),band-tailed pigeon (*Columba fasciata*), mourning dove (*Zenaida macroura*), Anna's

hummingbird, belted kingfisher (*Ceryle alcyon*), Nuttall's woodpecker, northern flicker (*Colaptes auratus*), common raven (*Corvus corax*), chestnut-backed chickadee, oak titmouse (*Baeolophus inornatus*), ruby-crowned kinglet (*Regulus calendula*), hermit thrush (*Catharus guttatus*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*),cedar waxwing (*Bombycilla cedrorum*), yellow-rumped warbler (*Dendroica coronata*), California towhee (*Pipilo crissalis*), fox sparrow (*Passerella iliaca*), song sparrow, white-crowned sparrow (*Zonotrichia leucophrys*), white-throated sparrow (*Zonotrichia albicollis*), golden-crowned sparrow (*Zonotrichia atricapilla*), dark-eyed junco, red-winged blackbird (*Agelaius phoeniceus*), house finch (*Carpodacus mexicanus*), lesser goldfinch (*Carduelis psaltria*), American goldfinch (*Carduelis tristis*), and house sparrow (Friends of Corte Madera Watershed, 2004).

Mammals

Mammal species using the project area include those adapted to urban environments, including coyote (*Canis latrans*), raccoon, western gray squirrel (*Sciurus griseus*), black-tailed deer, and striped skunk (*Mephitis mephitis*).

Invasive Species

In addition to the native plant, fish, and wildlife species that are found within the project area, many non-native and invasive terrestrial and aquatic species also occur. Invasive plants are defined as noxious by state and federal regulation and classified by the California Invasive Plant Council (Cal-IPC) as high, moderate, limited, alert, or watch, depending on the severity of ecological impacts and rates of dispersal and establishment for each species (Cal-IPC, 2020). Invasive plant species documented within the overstory in the project area include silver wattle (moderate), red gum (limited), blue gum (limited), glossy privet (limited), and Mexican fan palm (moderate/alert). Invasive plant species documented within the understory include cape ivy (high), French broom (high), English ivy (high), Himalayan blackberry (high), Russian thistle (moderate), and periwinkle (moderate). Additional invasive plant species may be found or have the potential to become established within the project area.

The only invasive aquatic species known to occur in Corte Madera Creek is the New Zealand mud snail (*Potamopyrgus antipodarum*). This species was collected from the creek and positively identified during the July 15, 2020, reconnaissance visit.

European starlings and rock pigeons are widespread invasive bird species documented in the project area. Starlings compete with native birds and are known to cause agricultural damage. Rock pigeons are considered pests in urban areas though are not considered as a large threat to native birds.

Special-Status Species and Sensitive Natural Communities

Special-status species are plants and animals that are legally protected under the federal Endangered Species Act (FESA) or the California Endangered Species Act (CESA) or under other regulations or policies such as the California Fish and Game Code and the Migratory Bird Treaty Act (MBTA). California species of special concern and plants identified as rare by the

California Native Plant Society (CNPS) are also considered special status and evaluated during the CEQA environmental review process. The reason an individual taxon (species, subspecies, or variety) is given such recognition is primarily the documented or expected decline in the species' population, limitation of its population size or geographical extent, and/or distribution resulting, in many cases, from habitat loss/fragmentation. More information on these regulations and the agencies that implement their protections is provided in Section 3.3.4, Regulatory Setting.

Special-status species include the following:

- Species listed, proposed, or candidate species for listing as threatened or endangered by the USFWS pursuant to the ESA of 1969, as amended
- Species listed as rare, threatened, or endangered by the CDFW pursuant to the CESA of 1970, as amended
- Species designated as fully protected under the California Fish and Game Code (Sections 3511, 4700, 5050, and 5515)
- Species designated by the CDFW as California species of concern
- Plant species included on CDFW's most recent *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW , 2020b) with a California Rare Plant Rank (CRPR) of 1, 2, 3, or 4
- Plants designated as rare under the California Native Plant Protection Act
- Species not currently protected by statute or regulation but considered rare, threatened, or endangered under CEQA (Section 15380)

Sensitive natural communities were defined as those natural community types with a state ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) as listed in the most recent *California Sensitive Natural Communities List* (CDFW, 2020c).

The subset of species that have a low, moderate, or high likelihood to occur in the project area are listed in Table 3.3-3. The subset of sensitive natural communities that have a low, moderate, or high likelihood to occur in the project area are listed in Table 3.3-4. Fish and wildlife species with a low to high likelihood to occur in the project area as well as plant or sensitive natural communities that have either a high likelihood to occur or previously documented occurrences that overlap with the project area are discussed in detail below.

Table 3.3-3 Special-Status Species with a Low, Moderate, or High Likelihood to Occur in the Project Area

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
		Vascular Plants	
Sonoma alopecurus *Alopecurus aequalis var. sonomensis*	FE/none/1B.1	Freshwater marshes and swamps, and riparian scrub; 15 to 1,200 feet	Moderate; suitable habitat present in project area (Unit 2)
Bent-flowered fiddleneck *Amsinckia lunaris*	None/none/CRPR 1B.2	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland; 5 to1,640 feet	Low; limited suitable habitat present in project area (Unit 3 and Unit 4)
Marsh sandwort *Arenaria paludicola*	FE/SE/CRPR 1B.1	Sandy soils and openings in freshwater or brackish marshes and swamps; 5 to 560 feet	Low; limited suitable habitat present in project area (Unit 2)
Coastal marsh milk-vetch *Astragalus pycnostachyus var. pycnostachyus*	None/none/CRPR 1B.2	Coastal dunes (mesic areas), coastal scrub, and streamsides of coastal salt marshes and swamps; 0 to 100 feet	Low; limited suitable habitat present in project area (Unit 2)
Thurber's reed grass *Calamagrostis crassiglumis*	None/none/CRPR 2B.1	Mesic areas in coastal scrub and freshwater marshes and swamps; 30 to 195 feet	Low; limited suitable habitat present in project area (Unit 2)
Seaside bittercress *Cardamine angulata*	None/none/CRPR 2B.2	Wet areas and streambanks in lower coniferous forest, North Coast coniferous forest; 80 to 3,000 feet	Moderate; suitable habitat present in project area (Unit 4)
Bristly sedge *Carex comosa*	None/none/CRPR 2B.1	Coastal prairie, lake margins of marshes and swamps and valley and foothill grassland; 0 to 2,050 feet	Moderate; suitable habitat present in project area (Unit 2)
Lyngbye's sedge *Carex lyngbyei*	None/none/CRPR 2B.2	Brackish or freshwater marshes and swamps; 0 to 35 feet	Moderate; suitable habitat present in project area (Unit 2)
Johnny-nip *Castilleja ambigua var. ambigua*	None/none/CRPR 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, and vernal pool margins; 0 to 1,425 feet	Moderate; suitable habitat present in project area (Unit 2)
Point Reyes bird's-beak *Chloropyron maritimum subsp. palustre*	None/none/CRPR 1B.2	Coastal salt marshes and swamps; 0 to 35 feet	Moderate; suitable habitat present in project area (Unit 2)

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Franciscan thistle *Cirsium andrewsii*	None/none/CRPR 1B.2	Mesic and sometimes serpentine soils in broadleaved upland forest, coastal bluff scrub, coastal prairie, and coastal scrub; 0 to 490 feet	Low; limited suitable habitat present in project area (Unit 4)
California lady's-slipper *Cypripedium californicum*	None/none/CRPR 4.2	Seeps and streambanks, usually serpentine areas of bogs and fens, and lower montane coniferous forest; 95 to 9,020 feet	Moderate; suitable habitat present in project area (Unit 4)
Western leatherwood *Dirca occidentalis*	None/none/CRPR 1B.2	Mesic areas of broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland; 80 to 1,395 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
California bottle-brush grass *Elymus californicus*	None/none/CRPR 4.3	Broadleaved upland forest, cismontane woodland, North Coast coniferous forest, and riparian woodland; 45 to1,540 feet	Moderate; suitable habitat present in project area (Unit 4)
Fragrant fritillary *Fritillaria liliacea*	None/none/CRPR 1B.2	Often serpentine areas in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland; 5 to 1,345 feet	Low; limited suitable habitat present in project area (Unit 3 and 4)
Large-flowered *leptosiphon Leptosiphon grandiflorus*	None/none/CRPR 4.2	Usually sandy areas of coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, and valley and foothill grassland; 15 to 4,005 feet	Low; limited suitable habitat present in project area (Unit 3 and Unit 4)
Marsh microseris *Microseris paludosa*	None/none/CRPR 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland; 15 to 1,165 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Baker's navarretia *Navarretia leucocephala subsp. bakeri*	None/none/CRPR 1B.1	Mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools; 15 to 5,710 feet	Moderate; suitable habitat present in project area (Unit 4)
Gairdner's yampah *Perideridia gairdneri subsp. gairdneri*	None/none/CRPR 4.2	Vernally mesic areas of broadleaved upland forest, chaparral, coastal prairie, vernal pools, and valley and foothill grassland; 0 to 2,000 feet	Moderate; suitable habitat present in project area (Unit 4)

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Michael's rein orchid *Piperia michaelii*	None/none/CRPR 4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest; 5 to 3,000 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Hairless popcornflower *Plagiobothrys glaber*	None/none/CRPR 1A	Alkaline meadows and seeps and coastal salt marshes and swamps; 45 to 590 feet	Low; limited suitable habitat present in project area (Unit 2)
North Coast semaphore grass *Pleuropogon hooverianus*	None/ST/CRPR 1B.1	Open areas and mesic soils in broadleaved upland forest, meadows and seeps, and North Coast coniferous forest; 30 to 2,200 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Nodding semaphore grass *Pleuropogon refractus*	None/none/CRPR 4.2	Mesic soils in lower montane coniferous forest, meadows and seeps, North Coast coniferous forest, and riparian forest; 0 to 5,250 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Marin knotweed *Polygonum marinense*	None/none/CRPR 3.1	Coastal salt or brackish marshes and swamps; 0 to 35 feet	Moderate; suitable habitat present in project area (Unit 2)
Point Reyes checkerbloom *Sidalcea calycosa subsp. rhizomata*	None/none/CRPR 1B.2	Freshwater marshes and swamps near the coast; 5 to 245 feet	Low; limited suitable habitat present in project area (Unit 2)
Santa Cruz microseris *Stebbinsoseris decipiens*	None/none/CRPR 1B.2	Open areas (sometimes serpentinite) in broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland; 30 to 1,640 feet	Low; limited suitable habitat present in project area (Unit 3 and Unit 4)
Suisun Marsh aster *Symphyotrichum lentum*	None/none/CRPR 1B.2	Brackish and freshwater marshes and swamps; 0 to 10 feet	Moderate; suitable habitat present in project area (Unit 2)
Saline clover *Trifolium hydrophilum*	None/none/CRPR 1B.2	Marshes and swamps, mesic and alkaline soils in valley and foothill grassland, and vernal pools; 0 to 985 feet	Moderate; suitable habitat present in project area (Unit 2)
		Nonvascular Plants	
Elongate copper moss	None/none/CRPR 4.3	On metamorphic rock (usually acidic, usually vernally mesic, often roadsides, sometimes carbonate) in broadleaved upland forest,	Low; suitable habitat potentially present in

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Mielichhoferia elongata		chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, and subalpine coniferous forest; 0 to 6,430 feet	project area (Unit 3 and Unit 4)
		Fish	
Coho salmon, central California coast ESU *Oncorhynchus kisutch*	FE/SE Critical habitat (designated)	Cool, low-gradient streams with deep pools and instream cover; spawns in gravel riffles	Low; presumed extirpated in Corte Madera Creek
Steelhead, central California coast DPS *Oncorhynchus mykiss*	FT/– Critical habitat (designated)	Rivers and streams with cold water, clean gravel of appropriate size for spawning, and suitable rearing habitat; typically rear in fresh water for one or more years before migrating to the ocean	High; known to be present in Corte Madera Creek
Longfin smelt *Spirnichus thaleichthys*	FC/ST	Open waters of estuaries, mostly in the middle or at the bottom of the water column; tolerate salinities ranging from nearly pure salt water to completely fresh water, though most prefer salinities of 15 to 30 ppt; spawning occurs in fresh water during the winter to early spring (February through April) over sandy or gravel substrate	Low; suitable habitat at the downstream end of project area in tidal marsh, but species not recorded in Corte Madera Creek
		Amphibians	
California giant salamander *Dicamptodon ensatus*	–/SSC	Wet coastal forests in or near clear, cold permanent and semi-permanent streams and seepages	Low; marginally suitable habitat in Unit 4; reported observations in Corte Madera Creek watershed (Friends of Corte Madera Watershed, 2004)
California red-legged frog *Rana draytonii*	FT/SSC Critical habitat (designated)	Breeds in still or slow-moving water with emergent and overhanging vegetation, including wetlands, wet meadows, ponds, lakes, and low-gradient, slow-moving stream reaches with permanent pools; uses adjacent uplands for dispersal and summer retreat	Low; suitable non-breeding aquatic habitat, but no hydrological connection to a known population; species presumed absent in eastern Marin County (District, 2017)

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Reptiles			
Western pond turtle *Actinemys marmorata*	–/SSC	Permanent, slow-moving fresh or brackish water with available basking sites and adjacent open habitats or forest for nesting	Low; suitable aquatic habitat found in Unit 4, though limited upland nesting habitat
Birds			
White-tailed kite *Elanus leucurus*	–/SFP	Year-round resident; lowland grasslands and wetlands with open areas; nests in trees near open foraging area	Moderate; documented along Corte Madera Creek in project area near Unit 2 (eBird, 2020); nesting and foraging habitat present
American peregrine falcon *Falco peregrinus anatum*		Wetlands, woodlands, cities, agricultural lands, and coastal area with cliffs (and, rarely, broken-top, predominant trees) for nesting; often forages near water	Low; foraging only; documented foraging in Corte Madera Marsh approximately 1.8 miles southeast of project area
California Ridgway's rail *Rallus obsoletus obsoletus*	FE/SE, SFP	Salt and brackish water marshes, typically dominated by pickleweed (Salicornia virginica) and Pacific cordgrass (Spartina foliosa)	Moderate; observed in 2020 approximately 1,800 feet downstream of project area in tidal marsh
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	–/SSC	Brackish marsh, riparian woodland/swamp, freshwater marsh, and salt marsh, often near upland habitats	Moderate; suitable foraging and nesting habitat in the coastal brackish marsh in Unit 2 at the downstream end of the project area
San Pablo song sparrow *Melospiza melodia samuelis*	–/SSC	Tidal salt marshes; requires dense vegetation for nesting; typically associated with California cord grass (Spartina foliosa), pickleweed (Salicornia pacifica), or gumplant (Grindelia stricta)	Moderate; suitable foraging and nesting habitat in the coastal brackish marsh in Unit 2 at the downstream end of the project area
Mammals			
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE/SE, SFP	Tidal salt marshes; depend on dense cover, preferring pickleweed (Salicornia pacifica) and saltgrass	Low; marginally suitable habitat at the downstream end of project area in tidal marsh.
Western red bat *Lasiurus blossevillii*	–/SSC	Riparian forests; woodlands near streams, fields, and orchards	Low (foraging only); limited suitable roosting habitat found in project area

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Townsend's western big-eared bat *Corynorhinus townsendii*	–/SSC	Most abundant in mesic habitats; also found in oak woodlands, desert, vegetated drainages, caves or cave-like structures (including basal hollows in large trees, mines, tunnels, and buildings)	Low (foraging only); limited suitable roosting habitat found in project area
Pallid bat *Antrozous pallidus*	–/SSC	Throughout California except for elevations greater than 3,000 meters in the Sierra Nevada; roosts in rock crevices, tree hollows, mines, caves, and a variety of vacant and occupied buildings; feeds in a variety of open woodland habitats	Low (foraging only); limited suitable roosting habitat found in project area

[a] Status codes:

Federal

FE = Listed as endangered under the federal Endangered Species Act (ESA)

FT = Listed as threatened under FESA

FC = Federal candidate species

State

SE = Listed as endangered under the California Endangered Species Act (CESA)

ST = Listed as threatened under CESA

SSC = CDFW species of special concern

SFP = State fully protected

CRPR

1B Plants rare, threatened, or endangered in California and elsewhere

2B Plants rare, threatened, or endangered in California, but more common elsewhere

3 More information needed about this plant, a review list

4 Plants of limited distribution, a watch list

0.1 Seriously threatened in California (high degree/immediacy of threat)

0.2 Fairly threatened in California (moderate degree/immediacy of threat)

0.3 Not very threatened in California (low degree/immediacy of threats or no current threats known)

Source: (CDFW, 2020a)

Table 3.3-4 Sensitive Natural Communities with a Low, Moderate, or High Likelihood to Occur in the Project Area

Natural community (Holland 1986)	Status (State Rank)	Distribution and Habitat Description	Likelihood within project area
Coastal brackish marsh	S2.1	Usually at the interior edges of coastal bays and estuaries or in coastal lagoons; most extensively developed around Suisun Bay at the mouth of the Sacramento–San Joaquin Delta. Dominated by perennial, emergent, herbaceous monocots to two meters tall; cover is often complete and dense; plant species include plants from both salt marshes and freshwater marshes	High; species and structure are present in project area
Northern coastal salt marsh	S3.2	Occurs along the coast from Pt. Conception north to the Oregon border; extensive in the Bay Area and Humboldt, Marin, Monterey, and San Luis Obispo Counties; found on hydric soils subject to regular tidal inundation in bays, lagoons, and estuaries; dominated by herbaceous, salt-tolerant hydrophytes, forming moderate to relatively complete cover, generally growing throughout the summer and dormant in winter	High; species and structure are present in project area

[a] Statis codes:

S1	Critically imperiled	S3	Vulnerable
S2	Imperiled	0.1	Very threatened
		0.2	Threatened

Source: (CNPS, 2020a)

Special-Status Plants

None of the 29 vascular and non-vascular special-status plant species with potential to occur in the project area were considered to have high potential to occur; no special-status plant species were both documented within the immediate vicinity and had suitable habitat within the project area. Eighteen species have moderate potential to occur within the project area, and ten vascular and one non-vascular special-status plant species were determined to have a low potential to occur within the project area. Three species with previously documented occurrences that overlapped with the project area (Appendix D) are described further in the sections below.

Napa False Indigo

Napa false indigo (*Amorpha californica* var. *napensis*), a CRPR List 1B.2 species, is a shrub in the Fabaceae family and is endemic to California. It occurs in elevations ranging from 390 to 6,560 feet, in openings in broadleaved upland forest, chaparral, and cismontane woodland and blooms from April to July. It is threatened by development and habitat alteration as well as potentially by road maintenance (CNPS, 2020a). Napa false indigo is generally found in Marin, Napa, and Sonoma counties, with a few occurrences in Lake and Monterey counties, as well, and usually found in chaparral habitats. Eighteen of the 76 total documented occurrences of the

species are located within the project vicinity (CDFW, 2020a). Known plant associates include madrone (*Arbutus menziesii*), tan oak (*Notholithocarpus densiflorus*), flat spurred piperia (*Piperia transversa*), Douglas fir (*Pseudotsuga menziesii*), coast live oak, canyon live oak (*Quercus chrysolepis*), California black oak (*Quercus kelloggii*), California nutmeg (*Torreya californica*), and California bay laurel (*Umbellularia californica*).

Although a 1924 documented occurrence of Napa false indigo overlaps with the project area, the location of the occurrence polygon is non-specific (location accuracy of 0.8 mile) (CDFW, 2020a), and the project area is considered to be outside the plant's elevation range. In addition, development over the last 100 years within the valley bottom may have extirpated the occurrence. This being the case, this species is considered not likely to occur in the project area.

Santa Cruz Tarplant

Santa Cruz tarplant (*Holocarpha macradenia*) – a federally threatened, state endangered, and CRPR List 1B.1 species – is an annual in the Asteraceae family and is endemic to California. It occurs in elevations ranging from 30 to 720 feet, often on clay and sandy soils of coastal prairie, coastal scrub, and valley and foothill grassland and blooms from June to October. It is seriously threatened by urbanization, agriculture, non-native plants, and lack of ecological disturbance (CNPS, 2020a). Santa Cruz tarplant was historically found in Alameda, Contra Costa, Monterey, Marin, Santa Cruz, and Solano counties; however, all natural populations have been extirpated, and only re-introduced populations are extant. It usually is found in grassy habitats. Two of the 37 total documented occurrences are located within the project vicinity, only one of which is considered extant (CDFW, 2020a). Known plant associates include wild oat (*Avena fatua*), rattlesnake grass (*Briza maxima*), bromes (*Bromus* spp.), California oat grass (*Danthonia californica*), wall barley (*Hordeum murinum*), and fescues (*Festuca* spp.) (USFWS, 2002).

Although an 1883 documented occurrence of Santa Cruz tarplant indigo overlaps with the project area, the location of the occurrence polygon is non-specific (location accuracy of 1 mile) (CDFW, 2020a). The population is considered extirpated, and suitable habitat is not present in the project area. As such, this species is considered not likely to occur in the project area.

White-Rayed Pentachaeta

White-rayed pentachaeta (*Pentachaeta bellidiflora*) – a federally endangered, state endangered, and CRPR List 1B.1 species – is an annual in the Asteraceae family and is endemic to California. It occurs in elevations ranging from 110 to 2,035 feet in cismontane woodland, and often serpentine areas of valley and foothill grassland, and blooms from March to May. It is threatened by development (CNPS, 2020a). White-rayed pentachaeta is found in Marin, Santa Cruz, and San Mateo counties and usually found in grassy or rocky areas. Six of the 14 total documented occurrences are located within the project vicinity, none of which are considered to be extant (CDFW, 2020a; CDFW, 2020d). Known plant associates include brodiaea species (*Brodiaea* spp.), tidy-tips (*Layia platyglossa*), dotseed plantain (*Plantago erecta*), and purple needle grass (*Stipa pulchra*) (CDFW, 2020a).

Although a 1912 documented occurrence of white-rayed pentachaeta overlaps with the project area, the location of the occurrence polygon is non-specific (location accuracy of 0.4 mile) (CDFW, 2020a). The population is considered extirpated, and the project area is considered to be outside the plant's elevation range. This being the case, this species is considered not likely to occur in the project area.

Sensitive Natural Communities

Four sensitive natural communities were identified in database queries as potentially occurring within the project vicinity (Appendix D). These sensitive natural communities were documented in CNDDB as Holland types (Holland, 1986) that were reviewed and translated to follow the vegetation classification system in the *Manual of California Vegetation* (*MCV*) (CNPS, 2020b). Two sensitive natural communities were determined to have no potential to occur as neither the characteristic plant species nor the habitat structure was present in the project area. Two communities, coastal brackish marsh and northern coastal salt marsh, were determined to have high potential to occur within the downstream end of Unit 2 (Source: (CDFW, 2020a)

Table 3.3-4). In addition, other sensitive natural communities may be present within the riparian habitat found in Unit 4. Although native oak species—predominantly coast live oak—are planted in some locations along the floodwall and within Frederick Allen Park, coast live oak woodland is not considered a sensitive natural community in the most recent *California Sensitive Natural Communities List* (CDFW, 2020c).

Coastal Brackish Marsh

Coastal brackish marsh is generally located on the interior edges of coastal bays and estuaries or in coastal lagoons (Holland, 1986). The most extensive stands are located in Suisun Bay at the mouth of the Sacramento–San Joaquin Delta. This habitat is dominated by perennial, emergent, herbaceous monocots approximately 6 feet tall. Vegetative cover is often dense, and plant associates include plants from both salt and freshwater marshes. Associated sensitive natural communities using *MCV* vegetation alliances include Pacific silverweed marshes, salt marsh bulrush marshes, slough sedge swards, gum plant patches, salt rush swales, water-parsley marsh, ditch-grass mats, and pondweed mats (CNPS, 2020b).

This vegetation community was documented at the downstream end of the project area, in Unit 2. Although the habitat type is not mapped according to *MCV* vegetation alliances, portions of the coastal brackish marsh was dominated by tuberous bulrushes, the characteristic species of the salt marsh bulrush marshes, an S3-ranked sensitive natural community.

Northern Coastal Salt Marsh

Northern coastal salt marsh is generally located on the coast from Point Conception north to the Oregon border, with extensive stands in the San Francisco Bay Area (Holland, 1986). This habitat is found on hydric soils subject to regular tidal inundation in bays, lagoons, and estuaries and is dominated by herbaceous, salt-tolerant hydrophytes. Vegetative cover is often dense. Associated sensitive natural communities using *MCV* vegetation alliances include Pacific silverweed marshes, Parish's glasswort patches, alkali heath marsh, gum plant patches,

pickleweed mats, western sea-purslane marshes, and California cordgrass marsh (CNPS, 2020b).

This vegetation community is potentially intermixed with the mapped coastal brackish marsh at the downstream end of the project area in Unit 2. Species documented within the coastal brackish marsh that are more closely associated with northern coastal salt marsh habitats include pickleweed and cord grass species, the characteristic species of pickleweed mats (S3), and, potentially, California cordgrass marsh (S3.2) if the cordgrass species present is determined to be California cordgrass (*Spartina foliosa*).

Fish

Coho Salmon, Central California Coast Evolutionarily Significant Unit

Coho salmon, although not observed in Corte Madera Creek since 1984, belong to the Central California Coast (CCC) Evolutionarily Significant Unit (ESU) and are state and federally listed as endangered. Corte Madera Creek is designated critical habitat for CCC Coho salmon. Adult Coho salmon typically migrate upstream from mid-November through mid-January then spawn into February or early March. As typical of Pacific salmon, Coho die after this single spawning episode. After rearing in the freshwater creek for usually one year, the juvenile Coho salmon out-migrate during spring high flows in April and May. They then spend 16 to 18 months at sea before returning as adults to spawn in their natal creek (Moyle, 2002). Juvenile Coho salmon prefer deeper pools (>3 feet) with overhead cover and habitat created by large woody debris in the stream channel. The juveniles do best in summer waters of 54 to 57 degrees Fahrenheit and do not persist in waters of 72 to 77 degrees Fahrenheit (Moyle, 2002).

Steelhead, Central California Coast Distinct Population Segment

Steelhead in Corte Madera Creek belong to the Central California Coast (CCC) Distinct Population Segment (DPS) and are federally listed as threatened. Corte Madera Creek is designated critical habitat for CCC Steelhead. Adult winter Steelhead enter the creeks and rivers on their spawning migrations between November and April. The timing of upstream migration for winter Steelhead is correlated with higher flow events, such as freshets or sand bar breaches, and associated lower water temperatures. Steelhead spend anywhere from one to five years in saltwater; a period of two to three years is most common (Busby, et al., 1996). Steelhead spawn in mainstems, tributaries, and intermittent streams (Everest, 1973; Barnhart, 1986)). Reiser and Bjornn (1979) found that Steelhead prefer spawning gravels ranging in size from 0.5 to 4.6 inches. The number of days required for Steelhead eggs to hatch is inversely proportional to water temperature and varies from about 19 days at 60.1 degrees Fahrenheit to about 80 days at 42.1 degrees Fahrenheit. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart, 1986). Upon emerging from the gravel, fry rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Older fry establish territories, which they defend. Young Steelhead feed on a variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. Rearing Steelhead juveniles prefer water temperatures of 45.0 to 58.0 degrees Fahrenheit and have an upper lethal limit of 75.0 degrees Fahrenheit. Steelhead that are successful in surviving to adulthood spend at least two years in fresh water before emigrating downstream. Steelhead are known to inhabit

Corte Madera Creek; however, population monitoring data are not available. In 1999, A.A. Rich conducted electrofishing in Corte Madera Creek and captured rainbow/Steelhead trout at a density of 0.03 to 0.14 fish/square meter of instream habitat (A. A. Rich and Associates, 2000).

Tidewater Goby

Tidewater goby is federally listed as an endangered species and a state species of special concern. It is distributed from San Diego County north to the mouth of the Smith River in Del Norte County. This species inhabits coastal lagoons and the uppermost zone of brackish large estuaries with muted tidal flow and prefers sandy substrate for spawning but can be found on silt, mud, or rocky substrates. Tidewater gobies can occur in water up to 15 feet in lagoons and within a wide range of salinity (0 to 42 ppt). This species was last observed in 1961 over a mile downstream of the project area and is likely extirpated from this locality (CDFW, 2020a). The project area does not contain the muted tidal flow estuarine conditions this species requires. Therefore, tidewater gobies will not be discussed in the impact assessment.

Longfin Smelt

The longfin smelt is a candidate for listing under federal ESA and is listed as threatened under CESA. Spawning occurs in fresh water during the winter to early spring (February through April) over sandy or gravel substrate. Most smelt die after spawning, but a few (mostly females) may live another year. The eggs are adhesive and hatch in 40 days, when water temperatures are 44 degrees Fahrenheit. Newly hatched larvae are 0.2 to 0.3 inches long. Larvae can be moved downstream to estuaries by high flows but may also spend considerable time in fresh water. Very few larvae (individuals smaller than 0.8 inches in length) are found in salinities greater than eight ppt. It takes almost three months for longfin smelt to reach the juvenile stage (USFWS, 2012). Rosenfield and Baxter (2007) reported that longfin smelt catch per unit effort was greater at channel sites (>23 feet deep) than at shoal sites (<23 feet deep) in the San Francisco Bay estuary in each age group, and the difference was significant from the first fall through the second spring of life and between the second fall and winter of life. This indicates that longfin smelt may preferentially select deep water rather than shallow water habitats. Sampling by the City of San Francisco during several years in the early 1980s detected longfin smelt in the Pacific Ocean, providing additional evidence that some part of this population migrates beyond the Golden Gate Bridge (City of San Francisco & CH2M HILL, 1985, in Rosenfield and Baxter, 2007). Longfin Smelt concentration in deep water habitats combined with migration into marine environments during summer months suggests that Longfin Smelt may be relatively intolerant of warm waters (Rosenfield & Baxter, 2007). The same may be true for Corte Madera Creek, especially given its shallow nature and summertime warming. Longfin smelt have been captured in the bay east of Corte Madera Creek, but no evidence establishes presence in the project area. Therefore, longfin smelt is not discussed further in the impact assessment.

Wildlife

California Giant Salamander

California giant salamander is endemic to California and a CDFW species of special concern. This species occurs in two, possibly three isolated regions from Mendocino County south to

Sonoma and Marin Counties, then continuing south of the San Francisco Bay from San Mateo to southern Santa Cruz County (Nafis, 2018). This species occurs in wet, humid coastal forests, particularly in Douglas fir, redwood, red fir, and montane and valley-foothill riparian habitats with cold permanent and semi-permanent rocky streams and seepages. Larvae and aquatic adults use aquatic stream habitats, and terrestrial adults use cover objects such as logs, leaf litter, rocks, or subterranean tunnels (Nussbaum, Brodie, & Storm, 1983). Adults actively migrate on rainy nights (Zeiner, Laudenslayer, Mayer, & White, 1988-1990).

There is a low likelihood for California giant salamander to occur in the project area. There are reported observations of California giant salamander in upper Corte Madera Creek watershed (Friends of Corte Madera Watershed, 2004; iNaturalist, 2020). While there is suitable aquatic habitat in Unit 4, this unit flows directly into the concrete-lined channel, which is unsuitable habitat. Furthermore, the adjacent upland habitat for terrestrial adults is very limited in extent and quality because of the narrow band of forest cover and proximity to housing and other human development. California giant salamanders will not be affected by project implementation and therefore will not be discussed further.

California Red-Legged Frog

California red-legged frog is federally listed as threatened and is a CDFW species of special concern. The species' range occurs from south of Elk Creek in Mendocino County to Baja California, with isolated remnant populations occurring in the Sierra foothills, from sea level to approximately 8,000 feet (Stebbins, 2003; Shaffer, Fellers, Voss, Oliver, & Pauly, 2004). Most California red-legged frog populations are currently largely restricted to coastal drainages on the central coast of California. California red-legged frog habitat generally includes wetlands, wet meadows, ponds, lakes, and low-gradient, slow-moving stream reaches. Breeding occurs in November through March, and habitats are generally characterized by still or slow-moving water with deep pools (usually at least 2.3 feet, though frogs have occasionally been known to breed in pools less than this depth) and emergent and overhanging vegetation (Jennings & Hayes, 1994). Breeding sites can be ephemeral or permanent; if ephemeral, inundation is usually necessary into the summer months (through July to August) for successful metamorphosis. Although some adults may remain resident year-round at favorable breeding sites, others may disperse overland up to a mile (1.6 kilometers) or more (Fellers & Kleeman, 2007). Movements may be along riparian corridors, but many individuals move directly from one site to another without apparent regard for topography or watershed corridors (Bulger, Scott, & Seymour, 2003). California red-legged frogs sometimes enter a dormant state during summer or in dry weather (aestivation), finding cover in small mammal burrows, moist leaf litter, root wads, or cracks in the soil.

California red-legged frogs are likely absent from the project area. While the project area is within the species' historical range, California red-legged frogs have not been detected in the Corte Madera Creek Watershed, and there are no known records within the species' dispersal range. The nearest CNDDB occurrence is approximately 4 miles northeast of the project area, at Point San Pedro; there is an extensive network of development, roads, and human activity that would preclude dispersal from this area. There is suitable non-breeding aquatic habitat in

Unit 4; the concrete channel in downstream Units 2 and 3 provides very little habitat value. High winter flows and the presence of predatory fish further reduce any habitat suitability for breeding. California red-legged frogs will not be affected by project implementation and therefore will not be discussed further.

Western Pond Turtle

Western pond turtle is a CDFW species of special concern. In California, this species is found from the Oregon border along the Pacific Coast Ranges to the Mexican border as well as west of the crest of the Cascades and Sierras. Western pond turtles inhabit fresh or brackish water characterized by areas of deep water, low flow velocities, moderate amounts of riparian vegetation, warm water and/or ample basking sites, and underwater cover elements, such as large woody debris and rocks (Jennings & Hayes, 1994). Along major rivers, western pond turtles are often concentrated within side channel and backwater areas. Turtles may move to off-channel habitats, such as oxbows, during periods of high flows (Holland D. C., 1994). Although adults are habitat generalists, hatchlings and juveniles require specialized habitat for survival through their first few years. Hatchlings spend much of their time feeding in shallow water with dense submerged or short emergent vegetation (Jennings & Hayes, 1994). Although an aquatic reptile, western pond turtles require upland habitats for basking, overwintering, and nesting, typically within 1 kilometer (0.6 mile) from aquatic habitats (Holland D. C., 1994).

Western pond turtle has a low likelihood of occurrence in the project area. There is suitable aquatic habitat in Unit 4, and the concrete channel downstream in Units 2 and 3 provides little habitat value. While there is some suitable aquatic habitat in Unit 4, there are few suitable deep pools and/or off-channel habitats and limited opportunities for basking sites as the reach is very shady. Western pond turtles require open uplands adjacent to water for nesting; the adjacent uplands are limited in extent and quality, providing marginal nesting opportunities because of the narrow band of forest cover and proximity to housing and other human development. The closest documented western pond turtle occurrence is at Phoenix Lake, a dammed impoundment of Ross Creek, which is located approximately 1.5 miles upstream from Lagunitas Road Bridge.

White-Tailed Kite

White-tailed kite is a CDFW fully protected species. White-tailed kite is a resident (breeding and wintering) species throughout central and coastal California, up to the western edge of the foothills of the Sierra Nevada; California constitutes the stronghold of its North American breeding range (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; Dunk, 1995). They are not migratory but may make slight seasonal range shifts in coastal areas during winter (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). White-tailed kites breed in lowland grasslands, oak woodlands or savannah, and wetlands with open areas. Riparian corridors represent a preferred landscape characteristic for kites in both the breeding and non-breeding seasons (Erichsen, 1995). Groves of trees are required for perching and nesting, though kites do not seem to associate with particular tree species (Dunk, 1995). Preferred foraging sites include open and ungrazed grasslands, agricultural fields, wetlands, and meadows that support large populations of small mammals. The white-tailed kite's year-round diet consists almost entirely

of small mammals (Dunk, 1995; Erichsen, 1995) but can also include birds, insects, and reptiles. White-tailed kites breed between February and October, with peak breeding in May through August (Zeiner, Laudenslayer, Mayer, & White, 1988-1990).

White-tailed kites have moderate potential to occur in the project area based on observations along Corte Madera Creek just downstream of the project area (eBird, 2020) and presence of suitable nesting and foraging habitat. The eBird (2020) sightings just downstream of the project area along Corte Madera Creek include two white-tailed kites "often seen in the area" and "carrying food," both signs of a likely breeding pair. The riparian corridor in the project area includes numerous tall trees with structure suitable for nesting and perching. Open spaces along Unit 2 (e.g., near College of Marin) provide foraging opportunities.

American Peregrine Falcon

The American peregrine falcon is a CDFW fully protected species. This species breeds in coastal California north of Santa Barbara, southern portions of the Sierra Nevada, and other mountains in northern California (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; White, Clum, Cade, & Hunt, 2002). This species uses a variety of open habitats including wetlands, woodlands, cities, agricultural lands, and coastal areas (Gertsch, DeWater, & Walton, 1994); riparian habitat and wetlands are particularly important (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). American peregrine falcons typically nest in open settings with unobstructed views and open access, often near water (e.g., wetlands, rivers, coastal areas). Nests are usually made in a depression or scrape on a high cliff ledge but are also found in dunes, on human-made structures, and occasionally within abandoned raptor nests in large, predominant snags or trees (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; White, Clum, Cade, & Hunt, 2002). Birds in urban environments have been observed nesting on city buildings and bridges (White, Clum, Cade, & Hunt, 2002). American peregrine falcons hunt prey in a variety of open habitat types such as wetlands, estuaries, mudflats, marshes, meadows, lakes, and rivers (Porter, White, & Erwin, 1973). Generally monogamous throughout the year, American peregrine falcon pairs roost and hunt cooperatively (White, Clum, Cade, & Hunt, 2002). This species feeds mainly on birds and occasionally bats or other small mammals, fish, or insects (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; White, Clum, Cade, & Hunt, 2002).

There is suitable foraging habitat for American peregrine falcon in the coastal brackish marsh in Unit 2 at the downstream end of the project area. This species has been documented foraging in Corte Madera Marsh approximately 1.8 miles southeast of the project area (eBird, 2020). There are no cliffs or predominant trees in the project area where peregrine falcons would be expected to nest though they have been known to nest in man-made structures including water towers or tall buildings. As foraging habitat will not be affected by any project element, American peregrine falcon is not discussed further.

California Ridgway's Rail

California Ridgway's rail (formerly California clapper rail) is federally listed as endangered. Ridgway's rails reside and breed entirely within the marshes of the greater San Francisco Bay estuary, including the Central/South Bay, San Pablo Bay, and Suisun Marsh areas. Critical

habitat has not been designated for this species. Ridgway's rails inhabit tidal salt marshes and brackish marshes, often dominated by pickleweed (*Sarcocornia pacifica*), gumplant (*Grindelia*), and/or cordgrass (*Spartina* spp.). Other plant associates include saltgrass (*Distichlis spicata*), bulrushes (*Scirpus* spp.), and cattails (*Typha* sp.). This species nests in the upper-middle tidal marsh plain or high tidal marsh zones. Nests must be high enough to be protected from tidal inundation for successful reproduction. To allow for concealment, vegetation surrounding the nest site is usually tall (50 centimeters high or greater near mean high water) (USFWS, 2010). Nest sites are composed of a platform and woven canopy of vegetation. Foraging and refuge areas include the adjacent transitional zone as well as the lower, middle, and high marsh zones.

There is a photo-verified 2019 Ridgway's rail sighting in Corte Madera Creek approximately 600 feet downstream of the project area on the right bank near a set of culverts (eBird, 2020). There are numerous other sightings from 2011, 2014, 2015, 2017, 2019, and 2020 in Hal Brown Park at Creekside, including calling, approximately 1,500 feet downstream of the project area. An adult Ridgway's rail with young has also been seen in the relict mouth of Tamalpais Creek near College of Marin Parking Lot 13, approximately 1,000 feet downstream of Unit 2 (S. Guldman, pers. comm. with D. Halligan, Stillwater, October 8, 2020). There is suitable cover habitat for this species immediately downstream of Unit 2 though it is not likely extensive enough to support nesting as the tidal zone as this location is very narrow. Recent Ridgway's rail surveys for the San Francisco Estuary Invasive Spartina Project report the College of Marin sub-area of Corte Madera Creek as having "insufficient habitat" (Oolofson Environmental, 2020).

Saltmarsh Common Yellowthroat

Saltmarsh common yellowthroat (also known as San Francisco common yellowthroat) (*Geothlypis trichas sinuosa*), a distinct subspecies of the common yellowthroat (*Geothlypis trichas*), is a CDFW species of special concern. It is a year-round resident in the San Francisco Bay Area. Typical habitats for San Francisco common yellowthroat include brackish marsh, riparian woodland/swamp, freshwater marsh, salt marsh, and upland freshwater marsh (Gardali & Evens, 2008). They are typically associated with peppergrass (*Lepidium latifolium*), cordgrass, and bulrush/tule (*Schoenoplectus* spp.) (Nur, Zack, Evens, & Gardali, 1997). The Point Reyes Bird Observatory found that during surveys, sites with more pickleweed tended to have fewer yellowthroats (Nur, Zack, Evens, & Gardali, 1997). Nests are usually placed over water in emergent aquatic vegetation, dense shrubs, or other dense vegetation.

There is suitable foraging and nesting habitat for saltmarsh common yellowthroat in the coastal brackish marsh in Unit 2 at the downstream end of the project area, and there are multiple sightings of common yellowthroat (*Geothlypis trichas*) in more extensive marsh habitat just downstream of Unit 2 (eBird, 2020).

San Pablo Song Sparrow

San Pablo song sparrow (also known as Samuel's song sparrow) (*Melospiza melodia samuelis*), a distinct subspecies of the song sparrow (*Melospiza melodia*), is a CDFW species of special concern. This California endemic subspecies' distribution is restricted to tidal and muted tidal

salt marshes along the San Pablo Bay, with the highest densities reported at the Petaluma River mouth (Spautz & Nur, 2008). Samuel's song sparrows are primarily associated with high marsh and pickleweed where there is tidal influence. Dense vegetation is required for nesting, song perches, and cover from predators (Marshall, 1948, in Spautz & Nur, 2008).

There is suitable foraging and nesting habitat for San Pablo song sparrow in the coastal brackish marsh in Unit 2 at the downstream end of the project area, and there are multiple sightings of song sparrow (*Melospiza melodia*) in more extensive marsh habitat just downstream of Unit 2 (eBird, 2020).

Salt Marsh Harvest Mouse

Salt marsh harvest mouse is federally and state-listed as endangered and is a CDFW fully protected species. Populations are currently found only in small portions of San Francisco, San Pablo, and Suisun bays and their tributaries (USFWS, 2010). Optimal habitat includes saline emergent wetlands vegetated by deep and dense stands of pickleweed. Though salt marsh harvest mice are strong swimmers, they require non-submerged, salt-tolerant plants (such as gumplant) to escape high tides (USFWS, 2010). Salt marsh harvest mouse can tolerate high salinity food and water. Suitable habitat includes salt marshes with dense pickleweed (*Salicornia virginica*) adjacent to upland vegetation for escape from higher tides. The diet of salt marsh harvest mouse includes both green vegetation and seeds, but pickleweed is a major food source. The mice are seldomly found in cordgrass, alkali bulrush, or pure stands of salt grass (Shellhammer, et al., 1982, in LSA, 2012). Salt marsh harvest mouse may also occasionally move into adjoining upland grassland areas (USFWS, 2010). The life span of salt marsh harvest mouse is only eight to twelve months, requiring constant population renewal. Females are sexually active from March to November but may only bear one litter per year (USFWS, 1984). Young salt marsh harvest mice can disperse a considerable distance, but fragmented habitats preclude wide dispersal. Salt marsh harvest mice will not cross open areas to disperse.

There is a very low possibility that salt marsh harvest mouse would occur in the downstream end of the project area beyond the concrete channel where the intertidal wetland is present. This species was last observed downstream of the project in 1959. This species is now presumed extirpated from the vicinity of the project area (CDFW, 2020a). There were sightings of salt marsh harvest mouse from the Corte Madera Ecological Reserve, approximately 2 miles east/southeast of the project area, in 1990 (CDFW, 2020a). Numerous observations have been made in the salt marshes east of Highway 101. Despite its very low potential to occur because of marginally suitable habitat, the salt marsh harvest mouse is federally, and state listed as endangered and fully protected by CDFW; therefore, its presence will be assumed in the wetland portion of Unit 2 for the purposes of the impact assessment and mitigation measure development.

Western Red Bat

Western red bat is a CDFW species of special concern. In California, the western red bat has been observed near the Pacific Coast and in the Central Valley and the Sierra Nevada range and foothills. Roosts have often been observed in edge habitats—near streams, fields, orchards, or

urban areas (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). This species roosts non-colonially, in dense canopies and within tree foliage, beneath overhanging leaves (Constantine, 1959; Shump & Shump, 1982), at 2 to 40 feet above ground level (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). Studies in the Central Valley found that summering populations are substantially more abundant in remnant riparian stands of cottonwood or sycamore greater than 164 feet wide than in younger, less-extensive stands (Pierson, Rainey, & Corben, ~~2000~~ 2006). Individuals may forage up to 0.3 to 0.6 mile from their day roosts (Zeiner, Laudenslayer, Mayer, & White, 1988-1990), both at canopy height and low over the ground (Shump & Shump, 1982). This species feeds primarily on small moths, but its diet may include a variety of other insects, such as crickets, beetles, and cicadas (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). Mating occurs in August and September. Breeding sites are associated with the same type and amount of cover as roost sites, within cottonwood/sycamore riparian habitats along large river drainages in the Central Valley (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; Pierson & Rainey, 2003). Fertilization is delayed until March or April. After an 80- to 90-day gestation period, pups are born from late May through early July.

There is foraging habitat for western red bat in the project area along Corte Madera Creek and possible opportunities for roosting in tree foliage in the riparian woodland associated with Unit 4. There are no recorded occurrences within 5 miles of the project area (CDFW, 2020a); however, few bat surveys have been conducted in this region. Western red bat is not expected to roost in trees associated with Unit 4 or Frederick Allen Park as this species is primarily associated with Fremont cottonwoods and sycamores. Because there will be no impacts to roosting habitat, and effects on foraging habitat would be beneficial by the creation of pools that may attract insects, these bat species are not discussed further.

Townsend's Big-Eared Bat

Townsend's big-eared bat is a CDFW species of special concern. They have been documented from sea level to 10,800 feet although, in California, maternity roosts appear to be confined to elevations below 5,900 feet (Pierson & Fellers, 1998; Sherwin & Piaggio, 2005). This species occurs throughout California and is associated with caves and structures in a variety of habitats from deserts to coastal scrub to montane forests. This cavity-dwelling species roosts and hibernates in caves (commonly limestone or basaltic lava), mines, buildings, bridges (with a cave-like understructure), rock crevices, tunnels, basal hollows in large trees, and cave-like attics (Pierson & Fellers, 1998; Pierson & Rainey, 2007). Foraging has been observed in a variety of habitats (e.g., oak woodlands, desert scrub, alfalfa fields, vegetated creek drainages and in forested areas).

There is foraging habitat for Townsend's big-eared bat in the project area along Corte Madera Creek; however, there are limited opportunities for roosting. The project area does not provide substantial cavity habitat (e.g., for maternity or overwinter roosts) such as caves or mines; however, this species may use old buildings or bridges as day roosts. Because there will be no impacts to roosting habitat, and any effects on foraging habitat would be beneficial by the creation of pools that may attract insects, these bat species are not discussed further.

Pallid Bat

Pallid bat, a CDFW species of special concern, is fairly widespread in California. Pallid bats occupy a variety of habitats, from arid deserts to grasslands to conifer forests and riparian areas. Roosts (including day, night, and maternity roosts) are typically located in rock crevices and cliffs; day roosts can also be found in tree hollows and caves (Hermanson & O'Shea, 1983; Lewis, 1994; Pierson, Rainey, & Miller, 1996; Pierson, Rainey, & Corben, 2001). In more urban settings, roosts are frequently associated with human structures, such as abandoned buildings, abandoned mines, and bridges (Pierson, Rainey, & Miller, 1996; Pierson, Rainey, & Corben, 2001). Overwintering roosts require relatively cool and stable temperatures out of direct sunlight. Pallid bats typically glean prey from the ground and may forage 1 to 3 miles from their day roosts (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). The pallid bat is a colonial species, with a typical maternal colony size of 50 to 300 individuals (Hermanson & O'Shea, 1983; Lewis, 1994; Pierson, Rainey, & Miller, 1996). Breeding occurs from late October to February. With an average litter size of two, the young are born between April and July and are typically weaned in August (Sherwin & Rambaldini, 2005).

There is foraging habitat for pallid bat in the project area along Corte Madera Creek; however, there are limited opportunities for roosting. The project area does not provide substantial cavity habitat (e.g., for maternity or overwinter roosts) such as caves or mines; however, this species may use old buildings or bridges as day roosts. Because there will be no impacts to roosting habitat, and any effects on foraging habitat would be beneficial by the creation of pools that may attract insects, these bat species are not discussed further.

Habitat Connectivity and Wildlife Movement

Fish Passage

Fish passage and instream habitat in the Corte Madera watershed are described below in context of the needs of the anadromous Steelhead, which still ascend the creek as adults, spawn, and rear juveniles in the headwater tributaries. These same habitat and passage requirements approximate the needs of coho salmon that once utilized Corte Madera Creek. Rearing habitat requirement for the juvenile Steelhead are similar to that required for resident rainbow trout in the stream.

Adult Steelhead migrate from the ocean into coastal freshwater streams and rivers for spawning during high-flow events occurring from December through March (Love, 2007). Coho salmon, currently extirpated from Corte Madera Creek, typically make their spawning migration up small coastal streams like Corte Madera Creek with the rains of mid-November to mid-December (Moyle, 2002). Most of the project area along Corte Madera Creek functions as a migration route that links the saltwater habitat of San Francisco Bay with headwater Steelhead spawning and juvenile rearing locations. The quality of the creek as a migration corridor is degraded by the concrete channelization found in Units 2 and 3. The bulkhead and poorly functioning fish ladder at the boundary between Units 3 and 4 further impairs upstream movement. A survey of the watershed identified 48 stream crossings within areas accessible to Steelhead (Taylor, Ross and Associates, 2006). Some of these stream crossings were complete

barriers to upstream movement (e.g., Phoenix Lake Dam), some were considered partial barriers (e.g., the Denil fish ladder), and others, such as the Lagunitas Road crossing, were not considered an obstruction (Taylor, Ross and Associates, 2006). Overall, Corte Madera Creek's anadromous fish migration corridor downstream of the Lagunitas Road Bridge has been modified and degraded by past human action but is still capable of supporting movement of fish under certain flow conditions (Love, 2007). Once migrating Steelhead pass the fish ladder, Unit 4 provides suitable access to upstream reaches that are utilized for spawning and rearing.

The concrete channel below the existing fish ladder acts as a velocity barrier for migrating adult salmonids during high-flow times because of limited low-velocity areas. The concrete channel may also act as a thermal barrier to smolts as they swim downstream to the ocean (Town of Ross, 2009, in USACE 2010). As a result, the concrete flood control channel has severely reduced access to the creek for spawning runs of these species (Friends of Corte Madera Creek, 2008). Steelhead have often been observed attempting to pass through the existing fish ladder. The fish ladder was constructed as a temporary solution to provide fish passage over the bulkhead until the Unit 4 project could be constructed. Although repairs to this ladder in 2005 reportedly improved its performance, the ladder still fails to provide suitable passage at higher flows that are more common during the period of migration (Love, 2007).

Rearing juvenile Steelhead also conduct local movements related to foraging for food, defending territories, or seeking improved water quality. These movements would typically occur in Unit 4 due to the presence of suitable habitat in that reach. Rearing juvenile Steelhead may also temporarily inhabit the existing fish-migration pools within the concrete channel but would attempt to move upstream as water quality conditions deteriorate during the summer months. These concrete channel rearing fish would have their upstream movements inhibited by the fish ladder.

Wildlife Travel

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (i.e., juvenile animals from natal areas or individuals extending range distributions); (2) seasonal migration; and (3) local movements related to home-range activities (i.e., foraging for food or water, defending territories, or searching for mates, breeding areas, or cover). Although a variety of terms have been used to discuss wildlife movement across the landscape, this discussion focuses on travel routes. Travel routes are determined by features on the landscape that provide food, water, and shelter while also connecting areas of suitable habitat.

Riparian and aquatic habitats can provide food, water, and cover for wildlife, and the habitats can be important travel routes. In the case of terrestrial species, most truly migratory species that use the riparian corridor in the project area are migratory birds. Larger animals, such as deer and coyote, are unlikely to make seasonal or life-cycle-driven movements through the project area beyond occasional dispersal movements of young animals as the floodwalls present substantial barriers to movement.

The reconnaissance survey and review of aerial photos of the project area indicate that urban development has encroached into the riparian habitat. Modifications of the riparian area include construction of houses and related structures, riparian vegetation removal and landscaping, and channel stabilization work. Channelization, alteration, and encroachment into what were riparian areas in Units 2 and 3 have removed most of the riparian habitat. The result is that areas downstream of Unit 4 would not provide a substantial terrestrial wildlife movement corridor. However, evidence was observed that otters and racoons use the concrete channel for foraging. Even though urbanization and other actions have also degraded the riparian area in Unit 4, a more natural channel form and riparian vegetation remain. Unit 4 does not serve as a connection between natural habitats and, therefore, may not be considered as a functioning migration corridor. However, it does provide habitat for localized wildlife movement within the riparian corridor and dispersal opportunities for wildlife that may be within the surrounding urban landscape. As a result, Unit 4 has greater value than the downstream units with respect to local wildlife movement and likely supports species adapted to survival in urbanized settings.

Habitat Conservation Plans and Natural Community Conservation Plans

There are no federal habitat conservation plans or State Natural Community Conservation Plans within Marin County. Therefore, this issue will not be discussed further in this EIR.

Critical Habitat

Corte Madera Creek contains designated critical habitat for CCC coho salmon and CCC steelhead.

The five essential habitat types for CCC coho salmon include (1) juvenile summer and winter rearing areas, (2) juvenile migration corridors, (3) areas for growth and development to adulthood, (4) adult migration corridors, and (5) spawning areas. Corte Madera Creek contains areas 1, 2, 4, and 5. Growth and development to adulthood (area 3) occurs primarily in near- and off-shore marine waters; however, final maturation takes place in freshwater tributaries when the adults return to spawn.

The physical or biological features (PBF) of critical habitat that are essential for the conservation of CCC Steelhead are the following: (1) freshwater spawning sites, (2) freshwater migration corridors, (3) estuarine areas, (4) near-shore marine areas, and (5) offshore marine areas. The CCC steelhead PBF within the project area include items 1 through 3.

The project area does not contain any designated critical habitat for plants or wildlife.

3.3.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

Federal Endangered Species Act

FESA protects listed fish and wildlife species from harm or "take," which is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take can also include habitat modification or degradation that directly results in death or injury to a listed wildlife species. An activity can be defined as take even if it is unintentional or accidental. Listed plant species are legally protected from take under FESA if they occur on federal lands or if a project requires a federal action, such as a Clean Water Act Section 404 fill permit.

The USFWS has jurisdiction over federally listed threatened and endangered species, and the National Marine Fisheries Service (NMFS, also called NOAA Fisheries) has jurisdiction over federally listed, threatened, and endangered marine and anadromous fish such as salmon and steelhead. These two agencies also maintain lists of species proposed for listing. Species on these lists are not legally protected under the FESA but may become listed in the near future; these agencies often include them in their review of a project. Designated critical habitats for FESA-listed species are also regulated and protected by these agencies.

Clean Water Act/Waters of the United States

Areas meeting the regulatory definition of "Waters of the United States" (Waters of the U.S.) (jurisdictional waters) are subject to the jurisdiction of the USACE under provisions of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (such as intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds), all impoundments of waters otherwise defined as Waters of the U.S., tributaries of waters otherwise defined as Waters of the U.S., the territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to Waters of the U.S. (33 Code of Federal Regulations [CFR] Section 328.3).

Impacts to jurisdictional Waters of the U.S. are regulated under Section 404 of the Clean Water Act, for which the USACE and the U.S. Environmental Protection Agency (USEPA) have enforcement responsibility. The water-quality-related aspects of the Clean Water Act have been delegated to the California Water Resources Control Board and the Regional Water Quality Control Boards (RWQCBs); those regulations are discussed below.

Federal Migratory Bird Treaty Act

The federal MBTA (16 United States Code [U.S.C.] § 703) prohibits the pursuit, hunting, take, capture, or killing of migratory birds in the United States, including nests and eggs of migratory birds during the breeding season. The current U.S. Department of the Interior interpretation of the MBTA (memorandum M-37050 in December 2017) does not prohibit or penalize take of

migratory birds that results from incidental take during operations. Taking of nests from construction activity remains prohibited under MBTA.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA) is the primary law governing marine fisheries management in U.S. federal waters. One objective of the act is to conserve Essential Fish Habitat. A consultation with NMFS is required whenever a federal agency permits, funds, or implements a project that could affect essential fish habitat. Corte Madera Creek and its upstream tributaries, including San Anselmo Creek and Fairfax Creek, are designated as Essential Fish Habitat for several species of salmonids. Thus, consultation with NMFS, concurrent with its FESA consultation, is likely to be required.

State and Regional Regulations and Agencies

California Endangered Species Act and Other Special-Status Species Regulations

CESA prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. The CESA definition of take differs from the FESA definition. Under CESA, take is defined as hunting, pursuing, catching, capturing, or killing or attempting to do any of those things. There is also no state-level equivalent of critical habitat for listed species.

In accordance with the CESA, the CDFW has jurisdiction over state-listed species (Fish and Game Code §2070). CDFW also maintains lists of species of special concern that are defined as species that appear to be vulnerable to extinction because of declining populations, limited ranges, and/or continuing threats. CDFW also regulates fully protected animals, a classification which was the state's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Most, but not all, fully protected animals also have been listed as threatened or endangered species under the more recent state and federal endangered species laws and regulations. CDFW can authorize take of listed species, except fully protected animals, under CESA Sections 2080.1 and 2081 and 2089.2-2098.26, which allow CDFW to issue Consistency Determinations, Incidental Take Permits (ITPs), and Safe Harbor Agreements, respectively.

Fish and Game Code Sections 1602

CDFW implements Section 1602 of Fish and Game Code through the Lake and Streambed Alteration Agreement process, under which it regulates changes in non-tidal aquatic habitats and the riparian corridors that often surround them. The Fish and Game Code section 1602 requires an entity to notify CDFW prior to commencing any activity that may (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit debris, waste, or other materials that could pass into any river, stream, or lake (CDFW, 2018). A Lake and Streambed Alteration Agreement (LSAA) covers activities that would result in the modification of the bed, bank, or channel of a stream, river, or lake, including water diversion and damming and removal of vegetation from the floodplain to the landward extent of the riparian zone. It governs both activities that modify the physical characteristics of the stream

and activities that may affect fish and wildlife resources that use the stream and surrounding habitat (i.e., the riparian vegetation or wetlands). A Section 1602 LSAA will often require mitigation, such as revegetation or replanting of riparian trees or other compensatory mitigation, for impacts to these resources.

Fish and Game Code Sections 3503 and 3513
Under California Fish and Game Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided. Fish and Game Code Section 3503.5 protects all birds of prey (raptors) and their eggs and nests, and under Section 3513, it is unlawful to take or possess any migratory non-game bird designated under the MBTA. Conservation measures incorporated into the project will assure compliance with these Fish and Game Code sections.

Clean Water Act Section 401/San Francisco Bay Regional Water Quality Control Board
The San Francisco Bay RWQCB has primary authority for implementing Section 401 of the federal Clean Water Act and California's Porter-Cologne Water Quality Control Act, which pertains to waters of the State of California. These statutes regulate water quality conditions by establishing processes for developing and implementing planning, permitting, and enforcement authority for waste discharges to land and water. The San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan) establishes beneficial uses for surface and groundwater resources and sets regulatory water quality objectives that are designed to protect those beneficial uses (RWQCB, 2011).

Under the current Basin Plan, designated beneficial uses for Corte Madera Creek include commercial and sport fishing, navigation, and contact and noncontact recreation; warm freshwater fish habitat; cold freshwater fish habitat; wildlife habitat; preservation of rare and endangered species; migration of aquatic organisms; and spawning, reproduction, and/or early development of fish. The Basin Plan provides a program of actions designed to preserve and enhance water quality and to protect beneficial uses. It meets the requirements of the USEPA and establishes conditions related to discharges that must be met at all times. The implementation portion of the Basin Plan includes descriptions of specific actions to be taken by local public entities and industries to comply with the Basin Plan's policies and objectives. These actions include measures for urban runoff management and wetland protection.

Native Plant Protection Act
The Native Plant Protection Act (NPPA; CFG Code Section 1900 et seq.) designates 64 species, subspecies, and varieties of native California plants as rare. NPPA prohibits take of rare native plants but includes some exceptions for agricultural and nursery operations, emergencies, and

after proper notification of CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

Oak Woodland Protection

Public Resources Code Section 21083.4

This section defines requirements under CEQA for evaluating project impacts on oak woodlands. Each county is required to determine whether a project in its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county shall require one or more of the following oak woodlands mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands:

> (1) Conserve oak woodlands through the use of conservation easements.
>
> (2)(A) Plant an appropriate number of trees, including maintaining plantings and replacing dead or diseased trees.
>
> (B) The requirement to maintain trees pursuant to this paragraph terminates seven years after the trees are planted.
>
> (C) Mitigation pursuant to this paragraph shall not fulfill more than one-half of the mitigation requirement for the project.
>
> (D) The requirements imposed pursuant to this paragraph also may be used to restore former oak woodlands.
>
> (3) Contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code, for the purpose of purchasing oak woodlands conservation easements, as specified under paragraph (1) of subdivision (d) of that section and the guidelines and criteria of the Wildlife Conservation Board. A project applicant that contributes funds under this paragraph shall not receive a grant from the Oak Woodlands Conservation Fund as part of the mitigation for the project.
>
> (4) Other mitigation measures developed by the county.

California Rare Plant Ranks

Special-status plants in California are assigned to one of five CRPR by a group of over 300 botanists in government, academia, non-governmental organizations, and the private sector. This effort is jointly managed by the CDFW and CNPS. The five CRPRs currently recognized by the CNDDB include the following:

- Rare Plant Rank 1A – presumed extinct in California
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere
- Rare Plant Rank 2 – rare, threatened, or endangered in California but more common elsewhere
- Rare Plant Rank 3 – a review list of plants about which more information is needed

- Rare Plant Rank 4 – a watch list of plants of limited distribution

Substantial impacts to plants ranked 1A, 1B, and 2 are typically considered significant based on Section 15380 of the CEQA Guidelines, depending on the policy of the lead agency. Plants ranked 3 and 4 may be evaluated by the lead agency on a case-by-case basis to determine significance thresholds under CEQA.

Local Regulations

Marin County Municipal Code

The following codes in the Marin County Municipal Code are relevant to the project (Marin County, 2020).

Chapter 22.27 Native Tree Protection and Preservation

Section 22.27.030 Prohibition on Removal of Protected Trees. Protected Trees shall not be removed except in compliance with Section 22.62.040 (Exemptions), and as provided for in Chapter 22.62 (Tree Removal Permits). (Ord. No. 3577, 2012)

Chapter 22.62 Tree Removal Permits

Section 22.62.040 Exemptions. The removal of any protected or heritage tree on a lot is exempt from the requirements of this Chapter if it meets at least one of the following criteria for removal:

A. The general health of the tree is so poor due to disease, damage, or age that efforts to ensure its long-term health and survival are unlikely to be successful;
B. The tree is infected by a pathogen or attacked by insects that threaten surrounding trees as determined by an arborist report or other qualified professional;
C. The tree is a potential public health and safety hazard due to the risk of its falling and its structural instability cannot be remedied;
D. The tree is a public nuisance by causing damage to improvements, such as building foundations, retaining walls, roadways/driveways, patios, sidewalks and decks, or interfering with the operation, repair, or maintenance of public utilities;
E. The tree has been identified by a Fire Inspector as a fire hazard;
F. The tree was planted for a commercial tree enterprise, such as Christmas tree farms or orchards;
G. Prohibiting the removal of the tree will conflict with CC&R's which existed at the time this Chapter was adopted;
H. The tree is located on land which is zoned for agriculture (A, ARP, APZ, C-ARP or C-APZ) and that is being used for commercial agricultural purposes. (This criterion is provided to recognize the agricultural property owner's need to manage these large properties and continue their efforts to be good stewards of the land.);

I. The tree removal is by a public agency to provide for the routine management and maintenance of public land or to construct a fuel break;
J. The tree removal is on a developed lot and: 1) does not exceed two protected trees within a one-year timeframe; 2) does not entail the removal of any heritage trees; and 3) does not entail the removal of any protected or heritage trees within a Stream Conservation Area or a Wetland Conservation Area.

It is recommended that a property owner obtain a report from a licensed arborist or verify the status of the tree with photographs to document the applicability of the criteria listed above to a tree which is considered for removal in compliance with this section. (Ord. No. 3577, 2012)

Chapter 22.130 Definition

22.130.030 Definitions of Specialized Terms and Phrases

Protected Tree and Heritage Tree. Any one of the following as indicated in the table below:

Common Name	Botanical Name	Protected Size Diameter at Breast Height	Heritage Size Diameter at Breast Height
Arroyo willow	*S. lasiolepis*	6 inches	18 inches
Big-leaf maple	*Acer macrophyllum*	10 inches	30 inches
Bishop pine	*Pinus muricata*	10 inches	30 inches
Blue oak	*Q. douglasii*	6 inches	18 inches
Box elder	*A. negundo var. californicum*	10 inches	30 inches
California bay	*Umbellularia californica*	10 inches	30 inches
California black oak	*Q. kelloggii*	6 inches	18 inches
California buckeye	*Aesculus californica*	10 inches	30 inches
California nutmeg	*Torreya california*	10 inches	30 inches
Canyon live oak	*Q. chrysolepis*	6 inches	18 inches
Chaparral oak	*Q. wislizeni*	6 inches	18 inches
Coast live oak	*Quercus agrifolia*	6 inches	18 inches
Coast redwood	*Sequoia sempervirens*	10 inches	30 inches

Common Name	Botanical Name	Protected Size Diameter at Breast Height	Heritage Size Diameter at Breast Height
Douglas-fir	*Pseudotsuga menziesii*	10 inches	30 inches
Giant Chinquapin	*Castanopsis chrysophylla*	10 inches	30 inches
Hawthorn	*Crataegus douglasii*	10 inches	30 inches
Mountain-mahogany	*Cercocarpus betuloides*	10 inches	30 inches
Narrow leaved willow	*Salix exigua*	6 inches	18 inches
Oak	*Q. parvula var. shrevei*	6 inches	18 inches
Oregon ash	*Fraxinus latifolia*	10 inches	30 inches
Oregon oak	*Q. garryana*	6 inches	18 inches
Pacific madrone	*Arbutus menziesii*	6 inches	18 inches
Pacific yew	*Taxus brevifolia*	10 inches	30 inches
Red alder	*A. rubra*	10 inches	30 inches
Red elderberry	*Sambucus callicarpa*	10 inches	30 inches
Red willow	*S. laevigata*	6 inches	18 inches
Sargent cypress	*Cupressus sargentii*	6 inches	18 inches
Scoulier's willow	*S. scouleriana*	6 inches	18 inches
Service-berry	*Amelanchier alnifolia*	10 inches	30 inches
Shining willow	*S. lucida ssp. lasiandra*	6 inches	18 inches
Silk tassel	*Garrya elliptica*	10 inches	30 inches
Sitka willow	*S sitchensis*	6 inches	18 inches
Tanbark oak	*Lithocarpus densiflorus*	10 inches	30 inches
Valley oak	*Q. lobata*	6 inches	18 inches

Common Name	Botanical Name	Protected Size Diameter at Breast Height	Heritage Size Diameter at Breast Height
Wax myrtle	*Myrica californica*	10 inches	30 inches
White alder	*Alnus rhombifolia*	10 inches	30 inches

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project.

Biological Resources

Goal BIO-1: Enhanced Native Habitat and Biodiversity. Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.

> ***Policy BIO-1.1: Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors***. Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local agencies and resource management agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.
>
> ***Policy BIO-1.3: Protect Woodlands, Forests, and Tree Resources***. Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas.
>
> ***Policy BIO-1.6: Control Spread of Invasive Exotic Plants***. Prohibit use of invasive species in required landscaping as part of the discretionary review of proposed development. Work with landowners, landscapers, the Marin County Open Space District, nurseries, and the multi-agency Weed Management Area to remove and prevent the spread of highly invasive and noxious weeds. Invasive plants are those plants listed in the State's Noxious Weed List, the California Invasive Plant Council's list of Exotic Pest Plants of Greatest Ecological Concern in California, and other priority species identified by the agricultural commissioner and California Department of Agriculture.

Goal BIO-2: Protection of Sensitive Biological Resources. Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts.

Policy BIO-2.1: Include Resource Preservation in Environmental Review. Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving "no net loss" of sensitive habitat acreage, values, and function.

Policy BIO-2.3: Preserve Ecotones. Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodlands and forests where they transition to grasslands and other habitat types.

Policy BIO-2.4: Protect Wildlife Nursery Areas and Movement Corridors. Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.

Policy BIO-2.5: Restrict Disturbance in Sensitive Habitat During Nesting Season. Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional when development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.

Policy BIO-2.8: Coordinate with Trustee Agencies. Consult with trustee agencies (the CDFW, USFWS, NOAA Fisheries, USACE, USEPA, RWCQB, and BCDC) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected. Goal BIO-3: Wetland Conservation. Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.

Policy BIO-3.1: Protect Wetlands. Require development to avoid wetland areas so that the existing wetlands and upland buffers are preserved and opportunities for

enhancement are retained (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone).

Goal BIO-4: Riparian Conservation. Protect and, where possible, restore the natural structure and function of riparian systems.

Policy BIO-4.4: Promote Natural Stream Channel Function. Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows sufficient capacity and natural channel migration, and allows reestablishment of woody trees and shrubs without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible. (Details in setbacks and other aspects of stream corridors are in Section 2.4 of the Marin Countywide Plan.)

Policy BIO-4.5: Restore and Stabilize Stream Channels. Pursue stream restoration and appropriate channel redesign where sufficient right-of-way exists that includes the following: a hydraulic design, a channel plan form, a composite channel cross-section that incorporates low flow and bankfull channels, removal and control of invasive exotic plant species, and biotechnical bank stabilization methods to promote quick establishment of riparian trees and other native vegetation.

Policy BIO-4.6: Control Exotic Vegetation. Remove and replace invasive exotic plants with native plants as part of stream restoration projects and as a condition of site-specific development approval in a SCA, and include monitoring to prevent reestablishment.

Policy BIO-4.7: Protect Riparian Vegetation. Retain riparian vegetation for: stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.

Policy BIO-4.8: Reclaim Damaged Portions of SCAs. Restore damaged portions of SCAs to their natural state wherever possible, and reestablish as quickly as possible any herbaceous and woody vegetation that must be removed within an SCA, replicating the structure and species composition of indigenous native riparian vegetation.

Policy BIO-4.9: Restore Culverted Streams. Replace storm drains and culverts in SCAs with natural drainage and flood control channels wherever feasible. Reopening and

restoring culverted reaches of natural drainages should be considered part of review of development applications on parcels containing historic natural drainages where sufficient land area is available to accommodate both the reopened drainage and project objectives. Detailed hydrologic analysis may be required to address possible erosion and flooding implications of reopening the culverted reach, and to make appropriate design recommendations. Incentives should be provided to landowners in restoring culverted, channelized, or degraded stream segments. Where culverts interfere with fish migration but replacement is not possible, modify culverts to allow unobstructed fish passage.

Policy BIO-4.15: Reduce Wet Weather Impacts. Ensure that development work adjacent to and potentially affecting SCAs is not done during the wet weather or when water is flowing through streams, except for emergency repairs, and that disturbed soils are stabilized and replanted, and areas where woody vegetation has been removed are replanted with suitable species before the beginning of the rainy season.

Policy BIO-4.16: Regulate Channel and Flow Alteration. Allow alteration of stream channels or reduction in flow volumes only after completion of environmental review, commitment to appropriate mitigation measures, and issuance of appropriate permits by jurisdictional agencies based on determination of adequate flows necessary to protect fish habitats, water quality, riparian vegetation, natural dynamics of stream functions, groundwater recharge areas, and downstream users.

Policy BIO-4.19: Maintain Channel Stability. Applicants for development projects may be required to prepare a hydraulic and/or geomorphic assessment of onsite and downstream drainage ways that are affected by project area runoff. This assessment should be required where evidence that significant current or impending channel instability is present, such as documented channel bed incision, lateral erosion of banks (e.g., sloughing or landsliding), tree collapse due to streambank undermining and/or soil loss, or severe in-channel sedimentation, as determined by the County. (More details are available in Section 2.4 of the Marin Countywide Plan.)

Policy BIO-4.20: Minimize Runoff. In order to decrease stormwater runoff, the feasibility of developing a peak stormwater management program shall be evaluated to provide mitigation opportunities such as removal of impervious surface or increased stormwater detention in the watershed.

Water Resources

Goal WR-1: Healthy Watersheds. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.

Policy WR-1.2: Restore and Enhance Watersheds. Support watershed restoration efforts, coordinate County watershed activities with efforts by other groups, and simplify permit acquisition for watershed restoration and enhancement projects.

Goal WR-2: Clean Water. Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses.

> ***Policy WR-2.3: Avoid Erosion and Sedimentation***. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and onsite sediment retention. Require developments to include onsite facilities for the retention of sediments and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.

Town of Ross Municipal Code

The following code in the Town of Ross Municipal Code is applicable to the project (Town of Ross, 2020).

Chapter 12.24 Planting, Alteration, Removal, or Maintenance of Trees

12.24.020 Definitions.

(5) "Native tree," means a tree native to those lands that now constitute the town of Ross.

(8) "Protected trees," means any tree located within twenty-five feet (25′) of the front or side yard property line or within forty feet (40′) of the rear yard property line of any parcel, with such tree having a diameter greater than eight inches (8″); and any tree planted as a replacement tree for a tree removed pursuant to this chanter or planted within a required yar setback area pursuant to a landscape plan approved by the town council.

(10) "Significant tree," means any tree having a single trunk diameter greater than twelve inches (12″), or any tree designated to be preserved on plans approved by the town council, or as a condition of approval of a project approved by the town council.

(11) "Tree," means a perennial plant having a permanent, woody, self-supporting main stem or truck ordinarily growing to a considerable height. As defined herein, a "tree" may include a shrub as well as a tree.

(13) "Unimproved parcel," means any parcel in Ross which does not have a structure on it suitable for human habitation.

12.24.060 Alteration or removal of trees on unimproved parcels. The following provisions apply to the alteration or removal of trees on unimproved parcels:

(1) It is unlawful for any person to alter or remove, or cause to be altered or removed, any tree six inches (6″) in diameter or greater on an unimproved parcel in Ross without first obtaining a Tree Alteration or Removal Permit from the Public Works Director.

(2) Any person desiring to alter or remove a tree on an unimproved parcel must file for a Tree Alteration or Removal Permit following the application procedure as described in Section 12.24.080.

12.24.070 Alteration or removal of trees on improved parcels. The following provisions apply to the alteration or removal of trees on improved parcels:

(1) No protected or significant tree shall be altered or removed without a Tree Alteration or Removal Permit.

(2) Any person desiring a Tree Alteration or Removal Permit must file for approval following the procedure as required by Section 12.24.080.

12.24.080 Tree Alternation or Removal Permits and Appeal. (4) Replacement tree. Unless otherwise specified by the Public Works Director or Town Council, replacement trees shall be required at the following ratios:

(a) A tree in good or excellent condition and structure shall be replaced on a one-to-one trunk diameter basis. (Example: 1 21" dbh tree in good or excellent condition must be replaced with new trees totaling 21" trunk diameter);

(b) A tree in fair or marginal condition or structure shall be replaced on a three-to-one trunk diameter basis. (Example: a 21" dbh tree in fair or marginal condition must be replaced with new trees totaling 7" trunk diameter);

(c) A tree in poor condition or creating a hazard to a building and/or structure, shall be replaced with 2 inches replacement trunk diameter.

Inches of replacement tree may be translated into standard nursery planting sizes using the following formulas:

24" box replacement tree = 2 inch replacement trunk diameter

36" box replacement tree = 3 inch replacement trunk diameter

48" box replacement tree = 4 inch replacement trunk diameter

If native species are removed, replacement trees shall be of a species native to those lands that now constitute the Town of Ross, or a non-native species approved by town staff based on specific site circumstances. Replacement trees should have the same mature size as the trees that have been removed, unless town staff recommends otherwise based on specific site circumstances. If there is a conflict between arborists regarding the condition or structure of a tree, the town arborist's decision shall control. The Town Council or Public Works Director may reduce the number of replacement trees or the tree replacement ratio, as applicable, if the reduction will not negatively impact the environmental functions and value of the urban forest or the aesthetic values of the community.

The applicant shall complete tree replacement within sixty (60) days of tree removal, unless the Town has approved a longer time. Failure to plant required tree replacement may subject the property owner to Administrative Penalties under Chapter 9.70 until the replacement trees are planted.

12.24.100 Tree protection plan. In order to protect trees during construction of a project and thereafter, and to maximize the chances of their subsequent survival, a tree protection plan shall be required on sites where Significant or Protected trees may be impacted. The tree protection plan shall include a certified arborist's report on existing conditions as well as a plan for tree protection during construction

Town of Ross General Plan

The following policies of the Ross General Plan related to biological resources are applicable to the project (Town of Ross, 2007).

Goal 1. An Abundance of Green and Healthy Natural Systems

1.1 Protection of Environmental Resources. Protect environmental resources, such as hillsides, ridgelines, creeks, drainage ways, trees and tree groves, threatened and endangered species habitat, riparian vegetation, cultural places, and other resources. These resources are unique in the planning area because of their scarcity, scientific value, aesthetic quality and cultural significance.

Goal 6. Protecting Creek Habitat and Reducing Flooding Hazards

6.7 Riparian Vegetation. Protect existing creek and riparian vegetation and encourage the use of native species during creek restoration. Assure that modification of natural channels is done in a manner that retains and protects creekside vegetation, integrates fish passage and includes habitat restoration in its natural state.

Marin County Flood Control and Water Conservation District

The Marin County Public Works Department maintains the public infrastructure of Marin County, including its roads, bridges, flood channels, and natural creeks. Within the Public Works Department, the Marin County Flood Control and Water Conservation District (Flood Control District) works to reduce the risk of flooding for the protection of life and property while utilizing sustainable practices. The Flood Control District aims to meet this mission through effective, transparent, and responsive planning, design, construction, operation, and maintenance of facilities such as stormwater pump stations, flood diversion and storage basins, bypass drains, creeks, ditches, and levees. All project elements would be designed to comply with the District's own policies and to obtain and comply with any necessary permits.

3.3.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan; or

Given the nature and location of the project, impacts are analyzed in this section relative to the following additional threshold:

g. Introduce a new non-native or invasive species of plant or animal into an area.

Approach to Impact Analysis

The following approach was used to inform the analysis of potential project impacts on biological resources. The potential for special-status species, protected habitats, wetlands, or riparian areas to occur in or near the project area was first assessed (see Section 3.3.3 for this assessment). Next, the project actions were considered to evaluate whether direct or indirect impacts on these resources were likely. Finally, the magnitude of any of those impacts was weighed against the significance criteria. More detail on these steps is presented in the following paragraphs.

Type of Impacts

Direct impacts occur through direct interaction of the resource with construction or operation and maintenance of the project. Direct impacts on plant and wildlife species are caused by loss of habitat in these communities at the time of ground disturbance. Site excavation, grading, filling, and infrastructure construction can also result in direct impacts from death, injury, or

disturbance (e.g., noise) to individuals to such an extent that the species cannot continue inhabiting or foraging in the area during construction (temporary impact) or over the life of the project operation and maintenance (permanent impact).

Direct impacts on natural communities include removal of these communities and replacement with other land uses. Direct impacts on habitat may be temporary—for example, if construction of the project disturbs a habitat that is subsequently restored, or individuals of a given species are displaced temporarily and then later return to the site. Impacts are considered permanent if the habitat is converted to some other type that no longer provides value to biological resources and the impacts persist past the operational period of the project.

Indirect impacts from a project may occur later in time, at a different location, or as the result of a sequence of related interactions (State CEQA Guidelines Section 15064[d][2] and [3]). Indirect impacts on species may occur when remaining fragments of undeveloped habitat are isolated from larger areas of contiguous habitat and individuals of a species suffer reductions in fitness or reproductive capability in these smaller fragments. Indirect impacts may occur concurrent with project implementation or at a later time due to degraded water quality, changes in hydrology, increased predation or competition, invasive species spread, and other indirect factors.

Significance Thresholds

The threshold for significance for impacts on special-status plants, fish, and wildlife would be any measurable decrease in population. A temporary impact would be significant if it resulted in a measurable alteration of the habitat that would result in a drop in the population of special-status species, such as changes in food supply, reduction in habitat elements needed for breeding, or changes that limit opportunities for cover and movement. For listed fish or wildlife and fully protected species, any loss of individuals would be a significant impact. For habitat modification, a significant impact is any measurable alteration of the habitat that would result in a drop in the population of special-status species, such as changes in food supply, reduction in habitat elements needed for breeding, or changes that limit opportunities for cover and movement. The threshold for significance for adverse effects on natural communities would be any reduction in extent of the community compared with baseline, or a change that could threaten the long-term existence of the community itself. The threshold of significance for wetlands is any net loss of extent. The threshold of significance for species migration would be the permanent interference in or inhibition of movement. The threshold of significance for local ordinances is a violation of any such ordinances. The threshold of significance related to invasive species is the introduction or spread of new non-native or invasive species.

3.3.6 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (f):** Implementation of the project would not conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan because there are no adopted HCPs, NCCPs, or other approved conservation plans in the project area.

Impacts Analyzed

Impact 3.3-1: The project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	Significance determination
	Construction: Less than significant with mitigation
	Operation and Maintenance: Less than significant

Construction

Direct Impacts

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Plants

Sixteen special-status plant species have the potential to occur in the riparian corridor in Unit 4 upstream of the existing Denil fish ladder. Construction activities including vegetation removal, tree removal, fence installation, grading, and installation of streambed stabilization measures could result in the direct mortality or damage to special-status plant species. Special-status plants may be present in the areas where construction activities may be performed; without surveys to document these species and measures to adequately protect them, they could be removed and/or habitat would be degraded. The removal of special-status plants or damage to their habitat would be a significant impact. To avoid or minimize this significant impact, the project would implement special-status plant avoidance **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and either avoidance of rare plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided. Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the direct impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Direct impacts on special-status aquatic species could occur from channel-bank stabilization (e.g., installation of rock and retaining wall), fish ladder demolition, and in-channel grading as well as dewatering activities in Unit 4. Project construction has been scheduled to allow

in-water work only during the period of June 15 to October 15, when creek flows will be low and special-status aquatic species are less likely to be present. However, the dewatering could potentially strand species if the dewatering were not completed carefully. In addition, contractors, if not properly trained, could work in unauthorized areas or in an unauthorized manner and potentially injure or kill special-status aquatic species. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1b: Fish Capture and Relocation** and **Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection**. Mitigation Measure 3.3-1b specifies the requirements for careful dewatering and aquatic species relocation using approved techniques and qualified personnel to avoid significant impacts on aquatic species, and Mitigation Measure 3.3-1c requires contractor environmental awareness training to avoid working in unauthorized areas, during unauthorized periods, or any unauthorized manner that could cause an impact on special-status aquatic species. Because the mitigation includes specific procedures to avoid killing or injuring aquatic species during in-water construction, impacts on special-status aquatic species would be less than significant with mitigation.

Terrestrial Species

There will be no direct impacts on special-status terrestrial species associated with tidal marsh habitats, including California Ridgway's rail or salt marsh harvest mouse, as no habitat for these species occurs in Unit 4. There will be no impact.

White-tailed kite, a fully protected species, could establish nests in riparian woodlands, which is the primary vegetation community in Unit 4 upstream of the existing Denil fish ladder. The peak breeding season for white-tailed kite is May through August. Up to 21 trees will be removed in Unit 4. Direct effects on white-tailed kite may include nest abandonment or premature fledging resulting from construction-related noise, vibration, and visual disturbance. Foraging kites and other migratory birds would be in open areas away from the project area and can keep away or disperse from temporary construction activities; therefore, effects to foraging kites and migratory birds are not anticipated. Impacts on white-tailed kite would be significant if a kite were nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on special-status and other migratory nesting birds; therefore, the impact on white-tailed kite would be less than significant with mitigation.

Unit 3 Frederick Allen Park (Town of Ross)

The Frederick Allen Park construction includes removal of the concrete channel, construction of a retaining wall, construction of short concrete floodwalls (approximately 2 feet tall), and excavation and grading within the channel and park to provide a natural floodplain and meandering low-flow channel, improved fish passage, increased low- and high-flow habitat for salmonids, reduced flood elevations, and natural benches and banks connecting to the park.

Approximately 144 trees would need to be removed within the Frederick Allen Park grading footprint if the USACE requires a 15-foot setback from the new floodwalls. Approximately 114 trees would be removed if a setback is not required. The improvements also include new landscaping and a realigned multi-use path within the park.

Plants

Ten special-status plant species have the potential to occur in the riparian corridor in Frederick Allen Park. Construction activities including vegetation removal, tree removal, fence installation, and excavation and grading within the park to provide creek-corridor widening could result in the direct mortality or damage to special-status plant species should they occur in the area. Focused special-status plant surveys have not been performed in the Frederick Allen Park area. Without surveys to document these species and measures to adequately protect them, special-status plants could be removed and/or habitat degraded. Removal of a special-status plant or habitat degradation would be a significant impact. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and avoidance of rare plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided. Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Direct effects on individuals of a special-status aquatic species could arise from construction within the concrete channel. Project construction has been scheduled to allow in-water work only during the period of June 15 to October 15, when creek flows will be low and special-status aquatic species are likely to be absent. However, the dewatering could potentially strand species if the dewatering were not completed carefully. In addition, contractors, if not properly trained, could work in unauthorized areas or in an unauthorized manner and potentially injure or kill special-status aquatic species. The District would avoid significant impacts by implementing careful dewatering and fish relocation using approved techniques and qualified personnel following **Mitigation Measure 3.3-1b: Fish Capture and Relocation** and conduct contractor environmental awareness training in accordance with **Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection**. Because the mitigation includes specific procedures to avoid killing or injuring aquatic species during in-water construction, the impact on special-status aquatic species is less than significant with mitigation.

Terrestrial Species

Frederick Allen Park is relatively narrow, heavily used by the public, and likely subject to heavy bird-nest predation pressures from corvids (e.g., crows and jays) that are attracted by human use and trash. There will be no direct impacts on white-tailed kite or special-status terrestrial species associated with tidal marsh habitats (i.e., California Ridgway's rail, saltmarsh common

yellowthroat, San Pablo song sparrow, or salt marsh harvest mouse) as no habitat for these species occurs in Frederick Allen Park. No impact would occur.

Unit 3 Fish Pool Construction

Unit 3 would be modified to include up to 11 new 11-foot-wide and 24-foot-long fish pools that would be 1.5 to 3 feet deep and spaced approximately 150 feet apart in the channel.

Special-Status Plants and Terrestrial Species

There are no special-status plant species or terrestrial wildlife impacts associated with the proposed fish pools because no habitat for special-status plants or terrestrial wildlife occurs in the concrete channel where the larger fish pools would be constructed. Therefore, no impact on special-status plant species or terrestrial wildlife would occur during fish pool construction.

Aquatic Species

Instream activities would require channel dewatering to allow for equipment access, concrete demolition at specific fish pool locations, and construction of the new fish pools. Adverse impacts of these activities include injury or mortality of any fish species that could be inhabiting Unit 3 at the time of dewatering. As mentioned previously, all in-water work activities have been scheduled to occur between June 15 and October 15, when water levels will be low and aquatic species are less likely to occur in the work area. While the construction schedule reduces the risk on aquatic species, significant impacts could potentially occur if dewatering activities were not properly implemented and individuals were stranded in Unit 3. The project would implement **Mitigation Measures 3.3-1b: Fish Capture and Relocation** to avoid this significant effect. Mitigation Measure 3.3-1b requires careful dewatering and fish relocation using approved techniques and qualified personnel. Because the mitigation includes specific procedures to avoid killing or injuring aquatic species during in-water construction, the impact on special-status aquatic species would be less than significant with mitigation.

Unit 3 and Unit 2 Floodwalls and Granton Park Stormwater Pump Station

Plants

Eight special-status plant species have the potential to occur in the footprint of the stormwater pump station. Construction activities including vegetation clearing and site grubbing, tree removal, fence installation, excavation, and, potentially, floodwall construction could result in the direct mortality or damage to special-status plant species if they occur in the area. Focused surveys for special-status plants have not been performed in the area. Special-status plants may be present in the areas where construction activities may be performed for installation of the floodwalls or stormwater pump station. Without surveys to document these species and measures to adequately protect them, special-status plants could be removed and/or habitat degraded, which would result in a significant impact on special-status plants. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and avoidance of rare plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided.

Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the impact on special-status plants would be less than significant with mitigation.

Aquatic Species
The Unit 3 and Unit 2 floodwalls and the stormwater pump station do not involve work within the channel of Corte Madera Creek. Therefore, construction of the floodwalls and stormwater pump station would have no impact on aquatic species.

Terrestrial Species
White-tailed kite, a fully protected species, could establish nests in riparian trees associated with the Unit 3 and Unit 2 floodwalls and stormwater pump station. Construction activities for the Unit 3 and Unit 2 floodwalls and stormwater pump station include tree and vegetation removal, including removal of approximately eight trees for the stormwater pump station. If the floodwall is constructed as an extension of the existing channel wall, no additional riparian trees will need to be removed. If the USACE requires that the floodwall be set back from the existing floodwall or a 15-foot setback between the new floodwall segment and existing trees, then construction activities for floodwall construction will result in the removal of 157 trees. All native riparian trees removed within the location of floodwalls and project components would be replaced within proximity to the removal location unless it is infeasible to locate replacement trees within District property while maintaining a 15-foot setback from the floodwall to comply with USACE Section 408 requirements.

The peak breeding season for white-tailed kite is May through August. Direct effects on white-tailed kite may include nest abandonment or premature fledging resulting from construction-related noise, vibration, and visual disturbance. Impacts on white-tailed kite would be significant if a kite were nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on special-status and other migratory nesting birds. Because the mitigation includes procedures to avoid impacting an active nest of a special-status avian species, the impact on white-tailed kite would be less than significant with mitigation.

Unit 2 Lower College of Marin Concrete Channel Removal
The Unit 2 lower College of Marin concrete channel removal project activities includes removal of approximately 625 linear feet of concrete flood-channel wall to create approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats. Habitat created in the earthen channel area would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change.

Plants

Thirteen special-status plant species have the potential to occur in the Unit 2 concrete channel removal footprint. Construction activities including vegetation clearing, tree removal, and grading could result in the direct mortality or damage to special-status plant species. Surveys for special-status plants have not been completed in the area. Special-status plants may be present in the areas where construction activities may be performed. Without surveys to document special-status plant species and measures to adequately protect them, they could be removed and/or the habitat degraded. The impact from removal of special-status plants or habitat degradation would be significant. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and avoidance of rare-plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided. Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Grading and Dewatering. Removal of the existing concrete channel and regrading of the creek bed in tidal areas could cause injury or mortality of any fish species that could be inhabiting the Unit 2 work area at the time of construction. The project construction has been timed to limit in-water construction to the period of June 15 to October 15 to avoid the period when special-status fish are more likely to occur in the area. The Unit 2 construction has been timed to limit in-water construction to the period of September 1 to October 31 to avoid the period when special-status fish are more likely to occur in the area and after the Ridgway's rail breeding season. The construction in Unit 2 will require dewatering of the work area, and the dewatering of the intertidal reach could result in significant impacts on special-status aquatic species if not properly implemented.

The upstream extent of tidal action in Corte Madera Creek is in the vicinity of the Kentfield Hospital. However, at low tide channel between Stadium Way and the SMN Bridge would be substantially free of tidal water (Sandra Guldman, pers. comm. December 4, 2020). Construction within this reach would require installation of two cofferdams: one at the Stadium Way Bridge and a sheet pile structure downstream of the Unit 2 concrete channel. Fish species would be removed and relocated from the Unit 2 construction reach as described in the dewatering plan developed by the Friends of Corte Madera Creek (see Appendix D).

The District would implement **Mitigation Measure 3.3-1b: Fish Capture and Relocation** and **Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection** to avoid significant impacts on aquatic species. Mitigation Measure 3.3-1b requires careful dewatering and fish relocation using approved techniques and qualified personnel. Mitigation Measure 3.3-1c requires contractor environmental awareness training to ensure all construction personnel follow authorized construction procedures to avoid impacts on special-status species.

It is expected that the Friends of Corte Madera Creek dewatering plan would reduce the impacts on fish present within the Unit 2 work area. However, depending on the tidal range at the time of construction, tidewaters could be present upstream of the Stadium Way Bridge cofferdam. Installation and closure of the cofferdam for up to eight weeks while potentially fish-bearing tidal water is upstream could result in the stranding and potential mortality of estuarine fish. Therefore, **Mitigation Measure 3.3-1f Intertidal Upstream of Stadium Way Cofferdam** that requires an inspection of the reach upstream of the Stadium Way cofferdam and fish removal would be implemented to avoid significant impacts on estuarine fish upstream of the Unit 2 work area.

Because the mitigation includes procedures to avoid injury or death of special-status fish during dewatering, the impact on special-status aquatic species from grading and dewatering would be less than significant with mitigation.

Noise. The proposed Unit 2 activity also includes pile driving to construct a cofferdam that would temporarily eliminate tidal action in the project reach and facilitate channel modifications. The noise generated during driving the pilings into the sediment of lower Corte Madera Creek has the potential to result in the injury or mortality of juvenile or adult salmonids that may be close to the work area.

The cofferdam would be constructed of sheet piles that would be driven into the substrate upstream of the Tamalpais Creek culvert using a Silent Piler Giken F101 vibratory pile driver. Approximately 175 piles will be driven side-by-side to install the nearly 225-foot-wide cofferdam, 40 feet of which will be located outside of the ordinary high tide line. The remaining pilings may be installed within the wetted low-tide perimeter, but much of the installation would occur during low-tide periods and on dewatered substrate.

The Fisheries Hydroacoustic Working Group (FHWG) has developed agreed-upon injury threshold criteria for listed fish species (FHWG, 2008). The FHWG identified sound pressure levels of 206 dB-peak (peak decibels) as being injurious to fish. Accumulated sound exposure levels (SEL) of 187 dB for fishes that are greater than 2 grams (g), and 183 dB for fishes below that weight, are considered to cause temporary shifts in hearing, resulting in temporarily decreased fitness (i.e., reduced foraging success, reduced ability to detect and avoid predators) (FHWG, 2008). It must be noted that recent research summarized in Popper et al. (2014) suggests that cumulative SEL thresholds for injury may be well above 200 dB.

The Silent Piler that will be used for this project has a noise level of about 63 dB at its fully operational mode. Therefore, the impact of the Unit 2 work and pile driving on fish species is less than significant.

Terrestrial Species

California Ridgway's Rail. California Ridgway's rail is known to occur within 1,000 feet of the furthest downstream portion of Unit 2. Saltmarsh common yellowthroat and San Pablo song sparrow, also special-status species, may nest in the coastal brackish marsh associated with Unit 2 at the downstream end of the project area. Heavy construction associated with the

concrete channel removal in lower Unit 2 is scheduled to begin after September 1, when California Ridgway's breeding season is complete.

Noise can negatively affect birds by causing them to lose hearing sensitivity temporarily or permanently or by increasing their stress levels by altering the production of stress hormones. Noise can also mask important background signals, thus preventing individuals from receiving important biological information such as sounds of predators or prey or through interfering with acoustic communications between individuals. The latter can interfere with finding mates and/or change how animals select foraging locations (Caltrans, 2016).

Laboratory evidence shows that continuous noise levels above 110 dBA (A-weighted decibels) lasting over 12 to 24 hours, or a single impulsive noise over 140 dBA SPL (125 dBA SPL for multiple blasts), can cause damage and loss of inner ear sensory hair cells, resulting in a large initial permanent threshold shift (PTS) followed by a small (~10–15 dB) lingering threshold shift even after all hair cells have been regenerated (Caltrans, 2016). At continuous noise levels below 110 dBA down to about 93 dBA, birds may experience a temporary threshold shift (TTS) that lasts from seconds to days, depending on the intensity and duration of the noise to which the animal was exposed. In contrast to a PTS, hearing recovers completely from TTS to the level that it was before the exposure. Nevertheless, during this period of TTS, the bird's hearing is temporarily impaired, and this could affect a variety of auditory and vocal communication behaviors, including detection of predators, communication with young, auditory feedback, etc. Received continuous noise levels below 93 dBA SPL are unlikely to cause even TTS in birds (Caltrans, 2016). The noise-masking threshold is approximately 60 dBA.

The Silent Piler that will be used for this project has a noise level of about 63 dB at approximately 53 feet during its fully operational mode. This is barely above the noise-masking threshold and well below the TTS level that could be injurious to birds. The attenuation rate for construction noise is about 6 dB per doubling of distance (Caltrans, 2016). Furthermore, operation of the Silent Piler will occur after September 1, when the nesting season will be complete for special-status bird species. Therefore, the impact of pile driving on Ridgway's rail, saltmarsh common yellowthroat, San Pablo song sparrow, or other bird species is less than significant.

There is the potential for other construction noise to adversely affect special-status bird species, including Ridgway's rail. Heavy equipment operations and concrete channel demolition could generate sound pressure levels that are detrimental to nesting bird species. Bulldozers, excavators, and jackhammers produce noise levels of 85 dBA at 50 feet (Caltrans, 2016). Assuming that the noise attenuation rate is 6 dB per doubling of distance, the decibel level at the nearest observation (600 feet) of Ridgeway's rail to the project area would be about 63 dBA. Although this noise level is below the TTS injury threshold, it would result in noise masking, which could make nesting birds and young more susceptible to predation. Therefore, heavy equipment operations involving demolition, grading, or construction of the lower Unit 2 concrete channel removal will commence after September 1 to avoid the nesting season. Impacts

on special-status birds would be less than significant due to the timing of construction heavy equipment use after September 1.

Salt Marsh Harvest Mouse. Salt marsh harvest mouse has a very low likelihood to occur in the project area. However, because the species is federally and state listed as endangered and fully protected by CDFW, any impact on this species, if it occurred in the area, would be significant. The District will implement **Mitigation Measure 3.3-1g: Avoid Salt Marsh Harvest Mouse** to avoid impacts on salt marsh harvest mouse. Mitigation Measure 3.3-1g requires the following: environmental training for all crews by a Qualified Biological Monitor, flagging suitable habitat for avoidance, having a biological monitor present for all vegetation removal within 50 feet of wetland habitat, hand removal and salvage of wetland vegetation, installation of salt marsh harvest mouse exclusion fencing to avoid salt marsh harvest mouse from entering the work area, timing work to avoid extreme high tides, and capping pipes or similar objects in mouse habitat. Because the mitigation includes procedures to avoid salt marsh harvest mouse, the impact on salt marsh harvest mouse would be less than significant with mitigation.

Indirect Impacts

Plants

Indirect damage or degradation to special-status plant species or habitat could result from construction activities introducing invasive plant species to the project site. Invasive plant species could spread between construction areas as well as from outside the project. Invasive plant species could also colonize recently disturbed graded soils. The project includes planting of riparian vegetation along the creek banks to restore native habitats and seeding areas of temporary construction disturbance with a native seed mix, which would help prevent the establishment of invasive plant species. The proposed planting mix for Frederick Allen Park and lower College of Marin is provided in Appendix B. Native planting would help prevent the establishment of invasive plant species. However, the revegetation effort may adversely affect habitat by introducing nonnative plant species. In addition, construction vehicles or equipment could carry invasive plant seeds or pathogens into the work area. Introduction of invasive plant species could cause degradation of special-status plant habitat, which would result in a significant impact on special-status plants. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of vehicle and specific requirements to prevent introduction of pathogens and invasive plant species during construction. Because the mitigation includes procedures to avoid introduction of invasive species, the indirect impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Channel stabilization and fish ladder demolition in Unit 4 would result in modification of instream habitat from its current condition. Since its construction, the fish ladder has resulted in ongoing adverse modification of instream habitat in Unit 4 through sediment aggradation upstream. In addition, the presence of the fish ladder has adversely affected fish migration by hindering the ability of adult fish to pass at that location during high flows. Its dilapidated condition, the lack of an entrance pool in the concrete channel, and the narrow range of

operating flows makes the fish ladder relatively ineffective for fish passage (MLA, 2019). In addition, the fish ladder halts the upstream movement of juvenile Steelhead due to excessive jump height. The project will remove the fish ladder, grade and stabilize Unit 4 upstream of the fish ladder removal with engineered streambed material, install biodegradable fabric-wrapped soil lifts with intervening live willow brush layers, bury a large rock keyway to protect the transition element, and provide a short section of concrete retaining wall to protect the streambank. Unit 3 and Unit 2 of Corte Madera Creek are currently contained within a concrete channel, which contains very poor habitat for migrating and rearing aquatic species. Work within the channel would improve steelhead migration habitat by removing approximately 60,000 square feet of the concrete waterway adjacent to Frederick Allen Park and restoring it to a natural aquatic and riparian condition and installing larger fish resting pools.

The Unit 4 features would together result in approximately 6,375 square feet and 3,625 square feet of temporary and permanent aquatic habitat impacts, respectively. The temporary impact is related to channel grading and streambed stabilization, which would adjust during the following high-flow seasons and continue to provide suitable instream habitat. The permanent impact would occur due to rock keyway placement and the reinforced concrete retaining wall, which would be along the channel margins. Riparian habitat impacts would result from the removal of 21 trees, which would be replaced within Unit 4. Given the limited affected area, riparian vegetation replacement, and improved fish-migration habitat from removal of the fish ladder, the temporary and permanent impact on in-stream and riparian habitat from the project elements in Unit 4 are not expected to adversely affect populations of the special-status aquatic species in the Corte Madera Creek area and has the potential to beneficially affect instream habitat populations due to removal of a fish-migration barrier. Following implementation of the project, the Corte Madera Creek channel would be wider, with increased habitat diversity, such as natural pool/riffle sequences, which would improve habitat conditions for juvenile salmonids and amphibians. The planting of native riparian vegetation (e.g., willows and alders) along the restored channel would increase stream shading and help moderate water temperature conditions. In addition, the removal of concrete and restoration of the natural channel would allow for the interchange of subsurface and surface water, which could also help moderate water temperatures. Therefore, the impact would be less than significant and, ultimately, the project is anticipated to have a beneficial impact on aquatic species. The lower Unit 2 concrete channel removal activities are contained within a concrete-lined channel, which contains very poor habitat for aquatic species. The new tidal, wetland, and riparian habitat created by the project would improve rearing conditions for aquatic species. Therefore, impacts on aquatic species habitat are considered beneficial and less than significant.

Indirect impacts include increased turbidity and suspended sediment within the channel from post-construction rewatering and initial storm runoff. Sediment resuspension may also increase the concentrations in the water column of chemicals sequestered in the sediment with potential toxicity to salmonids and other aquatic species and may result in adverse water quality and biological effects. At high levels, turbidity and suspended sediment in the water column can lower levels of dissolved oxygen. However, after the initial spike in turbidity levels, sediments

would disperse and background levels would likely be restored within hours of disturbance. Persistent elevated levels of turbidity would constitute a significant impact on aquatic species and habitat. However, implementation of the project's erosion control measures in the Stormwater Pollution Prevention Plan and federal and state regulatory permits (Clean Water Act 404, Clean Water Act 401, etc.) would address this potential effect. Best Management Practices typical for civil construction projects will be implemented, such as straw wattles, silt fences, erosion-control matting, and stabilized construction entrances. Removal of the fish ladder would create long-term benefits for natural sediment processes. Therefore, indirect impacts on aquatic species due to increased turbidity and suspended sediment are less than significant.

Removal of trees and other vegetation in the riparian corridor could also adversely affect perennial stream habitat by reducing overstory shade at the project site, which may reduce habitat quality in downstream areas by increasing water temperatures, increasing algal growth, and lowering dissolved oxygen levels. Substantially depressed oxygen levels may cause respiratory stress to aquatic life and, when levels are depressed enough, may cause mortality. Persistent high water temperatures, algal growth, or low dissolved oxygen levels would constitute a significant impact on aquatic species and habitat. However, very few trees (i.e., seven) would be removed within Unit 4. Project activities in Frederick Allen Park, in the Unit 2 and Unit 3 floodwall installation area, and stormwater pump station would also require the removal of existing native and non-native upland trees to facilitate demolition of the concrete channel and associated restoration grading, installation of floodwalls, and installation of the stormwater pump station. Most of these trees are located away from the top of bank and do not provide shading to the channel. The trees along the top of bank provide minimal shading of the low-flow channel. In addition, the elevated water temperatures occur during the summer months due to the substrate heating of the very shallow water flowing over the hot concrete channel. The high water temperatures create inhospitable conditions for juvenile steelhead and other species. In addition, any trees removed from the riparian area would be replaced. There would not be significant changes in overstory shading and subsequent indirect water quality effects. Therefore, the impact on special-status aquatic species from tree removal is less than significant.

Terrestrial Species

As discussed above, removal of trees and other vegetation in the riparian corridor could reduce the number of trees available to nesting white-tailed kites in Unit 4 upstream of the existing Denil fish ladder, within Frederick Allen Park, and along the floodwalls in Units 3 and 2. Up to 358 trees would be removed. Any trees removed from the riparian area in Unit 4 would be replaced and up to 125 trees would be planted within Frederick Allen Park. Because of the heavy human activity and traffic in Frederick Allen Park, Frederick Allen Park does not currently provide habitat for special-status birds such as white-tailed kite. The removal of trees along the Unit 3 and Unit 2 floodwalls, if required by the USACE, and removal of trees at the stormwater pump station could reduce the number of nesting trees available to white-tailed kite. However, there are similar trees adjacent to the project area on private property available

to kites that would not be removed. The alteration and creation of riparian habitat would not result in a drop in any population of terrestrial special-status species. Because the project would result in a net increase in riparian habitat and there are numerous trees adjacent to the removed trees that would continue to provide habitat for white-tailed kite, the indirect impact on special-status terrestrial species from Unit 4, Frederick Allen Park, floodwall, and stormwater pump station implementation is less than significant.

The Unit 2 lower College of Marin concrete removal would create approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats by removing or lowering approximately 625 lineal feet of concrete flood channel wall. Habitat created in the earthen channel area would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. The new tidal and wetland habitat created by this phase of the project would improve habitat conditions for special-status bird species including Ridgway's rail, saltmarsh common yellowthroat, and San Pablo song sparrow as well as for salt marsh harvest mouse. There would be no adverse impact on special-status terrestrial species. The lower College of Marin concrete channel removal will result in a long-term benefit to special-status terrestrial species.

Operation and Maintenance

Once constructed, the project would require ongoing operations and maintenance activities. Proposed operation and maintenance activities are described in Section 2.7. Vegetation management activities would be implemented to achieve three main goals:

1. Maintain channel flow capacity.
2. Reduce fire fuels.
3. Restore creek habitat by removing invasive nonnative plants and revegetating with native plants.

Unit 4 would likely not require maintenance due to the channel being in its natural state. However, vegetation management within the restored channel adjacent to Frederick Allen Park would be necessary to maintain channel flow capacity and ensure proper establishment of landscaping. Sediment management activities may be periodically required to maintain the constructed fish pools and flood capacity within the Frederick Allen Park channel and floodplain. Sediment management activities could include erosion control and repairs after storm events, particularly in the years immediately following construction while vegetation is establishing.

Plants

As the vegetation management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and trees, operation and maintenance activities would have no impact on special-status plant species. Improved public access from Frederick Allen Park to the creek and adjacent riparian areas could result in trampling special-status plant species that may become established after project implementation. Without measures to educate the public, any newly established special-status plants could be impacted and/or the habitat degraded. Several project elements will minimize this potential impact

including (1) the short wall and split-rail fence that will be installed for safety at the top of the creek bank, which will help prevent inadvertent access; (2) educational signs that will be installed, which will educate the public about the importance of riparian areas and need to keep out of restored habitats; and (3) trash receptacles that will be placed in Frederick Allen Park, which will reduce the amount of trash that could enter the restored habitats. Because of the implementation of the above elements to reduce trampling of riparian vegetation, the impact on special-status plants would be less than significant.

Aquatic Species

Of the four types of maintenance activities, only vegetation management and sediment/debris removal have the potential to affect special-status aquatic species. The floodplain planting plan for Frederick Allen Park will utilize tree species with widely spaced single trunks and shrubs that would bend over during high flows. This would minimize sediment deposition during high flows and the need for maintenance adjacent to Frederick Allen Park. There is the possibility that sediment could deposit in the new fish migration pools; however, sediment removal from fish pools is currently part of the maintenance procedures for the creek within this area, and the removal of sediment by hand would not create new impacts on aquatic species or their habitat. Vegetation management would occur during low-flow periods when treatment areas are not within the wetted perimeter of the creek. If necessary, any sediment management would occur during summer low-flow periods and would occur outside of areas that could be occupied by fish. Therefore, impacts from operation and maintenance of the project would be less than significant.

As stated above, the increase in public access to the restored Frederick Allen Park floodplain could result in trampling of newly planted vegetation, which could retard the development of streambank riparian and aquatic habitat. The project elements (short fence, educational signage, and trash receptacles) would help reduce impactive public access. In addition, CDFW regulations prohibit fishing in Corte Madera Creek. Therefore, this impact would be less than significant.

Improved public access also provides an opportunity for local schools to develop field-based science curriculum that includes investigation into the species and physical and biological processes of Corte Madera Creek.

Terrestrial Species

The stormwater pump station is the only operable project element that would be installed as part of the project. The stormwater pump station would only operate during storm events, and the only noise-producing element of the stormwater pump station is the back-up generator, which would only operate during emergencies and during annual testing. Operation and maintenance of the stormwater pump station would have no impact on special-status terrestrial species.

Maintenance activities, including pump station maintenance and floodwall inspection and maintenance, will be similar to those maintenance activities currently conducted by the District

in the project area and would not affect special-status terrestrial species. The project will create higher value riparian habitat within Frederick Allen Park that would be suitable for special-status birds. The new habitat would have a beneficial impact on special-status terrestrial species.

Maintenance of the habitat and new recreational access to the channel and riparian habitat could impact nesting birds if they were to occur in areas of vegetation management or human access. The project includes installation of a split-rail fence to restrict access to new habitats and signs educating the public to stay out of the riparian vegetation. The vegetation management and erosion control activities conducted within Frederick Allen Park would be similar to activities conducted by the District in similar habitats throughout the watershed and would follow standard operating protocols and compliance with CDFW maintenance permits to avoid impacts on special-status species. The impact on special-status species would be less than significant.

Improved public access from Frederick Allen Park to the creek and adjacent riparian areas could result in increased human–wildlife interactions in the creek. However, there would be educational signs that would be installed to educate the public about the importance of riparian areas and need to keep out of restored habitats. In addition, trash receptacles would be placed in Frederick Allen Park to reduce the amount of refuse that could enter the restored habitats and attract corvids (e.g., jays, crows, ravens), which could prey on nesting birds. Therefore, the impact on special-status terrestrial species would be less than significant.

Mitigation: Implement Mitigation Measures 3.3-1a through 3.3-1g.

Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities. Prior to construction, the District shall have a qualified botanist conduct botanical surveys according to CDFW protocols (i.e., Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities [CDFW, 2018 or more current]) during the appropriate time(s) of year (i.e., surveys shall coincide with the phenological stage during which the potential special-status plant species are identifiable in the field—for example, in April and again in July) to determine if any potential special-status plant species or sensitive natural communities are located within or immediately adjacent to the project area. If construction is planned to begin prior to the completion of comprehensive botanical surveys (e.g., construction is planned for April 2022, but plant surveys are planned for April and July), then the District shall conduct comprehensive plant surveys the year prior to construction (e.g., in 2021). If no special-status plants or sensitive natural communities are observed during appropriately timed surveys by a qualified botanist, it is assumed the construction activity will have no impact on special-status plants or sensitive natural communities and no further action is required.

Immediately preceding construction, the District shall flag or otherwise mark (e.g., stake, fence) areas with special-status plants or sensitive natural communities within the

project area for avoidance, including a 10-foot radius buffer. The District also shall identify locations for equipment and personnel-access and materials staging that will minimize disturbance in riparian habitat and coastal brackish marsh. When heavy equipment is required, unintentional soil compaction shall be minimized by using equipment with a greater reach or using low-pressure equipment. A biological monitor shall be present during construction within a 10-foot buffer of special-status plants to ensure impacts are avoided.

If avoidance of any special-status plant is not possible, prior to construction the District shall coordinate with CDFW and/or USFWS to establish procedures for compensatory mitigation. These measures may include collection of seeds when mature (generally the beginning of plant senescence) and salvage and transplant of any special-status plants that would otherwise be impacted by construction activities. Mitigation ratios, location, and timing of transplants shall be determined in consultation with CDFW and/or USFWS, and the mitigation ratio will be at a minimum of 1:1. The District shall monitor the success of transplant establishment for a period of at least three years, or as otherwise required by CDFW and/or USFWS. Location of transplanted individuals shall be recorded using a submeter-accuracy global positioning system (GPS) to enable location of the special-status plant species during and after the monitoring period is complete.

Mitigation Measure 3.3-1b: Fish Capture and Relocation. If in-channel work requires dewatering, including for sediment-removal maintenance activities, fish shall be captured and relocated upstream of the project areas to avoid injury and mortality and minimize disturbance. The District shall implement the measures below and described in the fish rescue plans for the project, or whatever more stringent species-preservation and avoidance measures are imposed by resource agencies, including NMFS and CDFW, with jurisdiction over aquatic special-status species.

1. The name(s) and credentials of qualified biologist(s) to act as construction monitors shall be submitted to CDFW and NMFS for approval at least 15 days before construction work begins.
2. Prior to and during the initiation of construction activities, a qualified fisheries biologist (i.e., approved by CDFW and/or NMFS) shall be present during installation and removal of creek-diversion structures.
3. For sites that require flow diversion and exclusion, the work area shall be blocked by placing fine-meshed nets or screens above and below the work area to prevent salmonids from re-entering the work area. To minimize the potential for re-entry, mesh diameter shall not exceed 1/8 inch. The bottom edge of the net or screen shall be secured to the channel bed to prevent fish from passing under the screen. Exclusion screening shall be placed in low-velocity areas to minimize fish

impingement against the mesh. Screens shall be checked periodically and cleaned of debris to permit free flow of water.

4. The intakes of the cofferdam bypass pipes will be screened in accordance with the NMFS and CDFW fish screen criteria. This will prevent entrainment of fish species in the bypass facilities

5. Before removal and relocation on individual fish begins, a qualified fisheries biologist shall identify the most appropriate release location(s). In general, release locations should have water temperatures similar to (<3.6 degrees Fahrenheit difference) the capture location and offer ample habitat (e.g., depth, velocity, cover, connectivity) for released fish and should be selected to minimize the likelihood of reentering the work area or becoming impinged on exclusion nets or screens.

6. The means of capture shall depend on the nature of the work site and shall be selected by a qualified fisheries biologist as authorized by CDFW and NMFS. Complex stream habitat may require the use of electrofishing equipment, whereas in outlet pools, fish and other aquatic species may be captured by pumping down the pool and then seining or dip netting. Electrofishing, if necessary, shall be conducted only by properly trained personnel holding current permits from CDFW and NMFS and following the most recent NMFS electrofishing guidelines (NMFS, 2000).

7. Initial fish relocation efforts shall be performed several days prior to the scheduled start of construction and continue through cofferdam installation and work-area dewatering activities.

8. The fisheries biologist shall survey the exclusion screening throughout the diversion effort to verify that no special-status fish, amphibians, or aquatic invertebrates are present. Handling of fish shall be minimized. When handling is necessary, personnel shall wet hands or nets before touching them.

9. Prior to translocation, fish that are collected during surveys shall be temporarily held in cool, aerated, shaded water using a five-gallon container with a lid. Overcrowding in containers shall be avoided; at least two containers shall be used, and no more than 25 fish shall be kept in each bucket. Aeration shall be provided with a battery-powered external bubbler. Fish shall be protected from jostling and noise and shall not be removed from the container until the time of release. A thermometer shall be placed in each holding container, and cold blocks or partial water changes shall be conducted as necessary to maintain a stable water temperature. Special-status fish shall not be held more than 30 minutes.

10. If fish are abundant, capture shall cease periodically to allow release and minimize the time fish spend in holding containers.

11. Fish shall not be anesthetized or measured. However, they shall be visually identified to species level, and year classes shall be estimated and recorded.
12. Reports on fish-relocation activities shall be submitted to CDFW and NMFS in within two weeks following completion of in-channel operations.

Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection. All construction personnel shall attend an environmental education program delivered by a qualified biologist prior to working in the project area. The training shall include an explanation as how to best avoid the accidental take of special-status species, including salmonids and other fish species, amphibians, reptiles, birds, and rare plants.

The training session shall be mandatory for contractors and all construction personnel. The field meeting shall include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis shall be placed on the importance of the habitat and life-stage requirements within the context of maps showing areas where minimization and avoidance measures are being implemented. The program shall include an explanation of appropriate federal and state laws protecting endangered species and all mitigation measures that will be implemented to avoid significant impacts on special-status species. Each person will receive a training handout for their use and reference.

The contractor shall provide closed garbage containers for the disposal of all trash items (e.g., wrappers, cans, bottles, food scraps). Work sites shall be cleaned of litter before closure each day and litter placed in wildlife-proof garbage receptacles. Construction personnel shall not feed or otherwise attract any wildlife. No pets, excluding service animals, shall be allowed in construction areas.

Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds. If tree removal occurs outside of the nesting season, no surveys or monitoring would be needed. If tree removal or construction occurs in the nesting season (February 1 to August 31), a qualified biologist shall conduct a white-tailed kite and general nesting bird survey within the project area and areas within a 500-foot buffer from project construction. If active nests are identified, a no-disturbance buffer zone will be established around the nest as appropriate and in consideration of line-of-sight for the bird as well as existing human presence/activities around the nest when it was established; recommended buffers are 500 feet for white-tailed kite and non-listed raptors, and 25 feet to 250 feet for other non-listed birds as recommended by a biologist who is qualified to assess avian breeding behavior. Smaller buffers may be appropriate in the project area given the limited line of site due to existing development and anthropogenic disturbance in the area (e.g., traffic on Sir Francis Drake and adjoining areas). Construction work may continue outside of the no-work buffer.

Mitigation Measure 3.3-1e: Invasive Plant Species Control. All vehicles and equipment entering the project shall be washed to remove dirt, pathogens, invasive plant seeds, or invasive plant parts prior to entry on the project site. Particular attention shall be shown to the undercarriage and any surface where soil containing invasive plant seeds may exist. The District shall dispose of the waste material in an appropriate disposal facility. Arrangements shall be made for inspection of each piece of equipment before entering the project construction areas to ensure all equipment has been properly washed. The District shall follow these additional measures:

- Any permanent or temporary erosion control measures implemented to minimize erosion during and after construction shall be certified weed-free.
- Nursery operations that supply revegetation or seeding plant material must certify implementation of best management practices to reduce pest and pathogen contamination within their nursery, including of Phytophthora pathogens, the pathogen responsible for Sudden Oak Death (SOD).
- All tree removal and trimming activities shall include measures to avoid the spread of SOD (Phytophthora) pathogens. This may include, but is not limited to the following:
  - As a precaution against spreading the pathogen, pruning tools shall be cleaned and disinfected after use on confirmed or suspected infested trees or in known infested areas. Tools shall be sanitized before pruning healthy trees or working in pathogen-free areas. Chippers and other vehicles of mud, dirt, leaves, organic material, and woody debris shall be cleaned before leaving a site known to have SOD and before entering a site with susceptible hosts.
  - Crews shall be informed about the arboricultural implications of SOD and sanitation practices when they are working in infested areas.
  - Sanitation kits containing chlorine bleach, scrub brush, metal scraper, boot brush, and plastic gloves shall be provided to crews.
  - Shoes, pruning gear, and other equipment shall be sanitized before working in an area with susceptible species.
  - When possible, the District shall conduct work on SOD-infected and susceptible species during the dry season (June through October). When working in wet conditions, equipment shall be kept on paved, graveled, or dry surfaces and mud avoided. The District shall work in disease-free areas before proceeding to any infested areas.
  - If possible, soil or plant material (wood, brush, leaves, and litter) from host trees in any infested areas shall not be collected. Rather, material (e.g., wood, bark, brush, chips, leaves, or firewood) from tree

removals or pruning of symptomatic or non-symptomatic host plants shall remain on site to minimize pathogen spread.

- All reasonable methods to sanitize personal gear and crew equipment shall be used before leaving an SOD infested site. Accumulated soil and mud shall be scraped, brushed, and/or hosed off from clothing, gloves, boots, and shoes. Mud and plant debris shall be removed by blowing out or power washing chipper trucks, chippers, bucket trucks, fertilization and soil aeration equipment, cranes, and other vehicles. Movement of soil and leaf litter shall be restricted under and around infected trees as spores may be found there.
- Tools used in tree removal/pruning may become contaminated and shall be disinfected with alcohol or chlorine bleach.

Mitigation Measure 3.3-1f: Intertidal Upstream of Stadium Way Cofferdam. Prior to completing construction of the cofferdam near Stadium Way for the Unit 2 dewatering, an inspection of the reach upstream will be conducted to determine if tidal water is present at low tide. A fish removal/herding effort will be initiated if tidal water is present. The fish removal/herding effort will consist of a beach seine sweep beginning at the upstream end of tidal water and proceeding in a downstream direction to the Stadium Way cofferdam site. The impoundment structure could be completed once the sweeping action is downstream of the cofferdam. This action would ensure that estuarine fish would not be stranded in standing water upstream of the Stadium Way cofferdam and be subject to injury or mortality during the approximately eight weeks this reach would be cut off from tidal flux.

Mitigation Measure 3.3-1g: Avoid Salt Marsh Harvest Mouse. Prior to initiation of project work in potential salt marsh harvest mouse habitat, the areas and pathways to be affected will be flagged by construction personnel and verified by a Qualified Biological Monitor (including work areas, staging areas, and access roads/paths to these work and staging areas). The flagged areas(s) will include a two-foot perimeter buffer.

All wetland vegetation and other vegetation within 50 feet of wetland vegetation requiring removal will be removed under the supervision of the USFWS- and CDFW-approved Qualified Biological Monitor. This vegetation will be salvaged and maintained on site and will be replanted upon completion of construction activities. Vegetation removal shall start at the edge farthest from the salt marsh or the poorest habitat and work its way towards the salt marsh or the better salt marsh habitat. If a mouse of any species is observed within the areas being removed of vegetation, work shall be halted and the USFWS and CDFW shall be notified.

To prevent salt marsh harvest mice from moving through the project site during construction, temporary exclusion fencing will be placed around defined work area(s) identified by the Qualified Biological Monitor prior to the start of construction activities.

The fencing will be installed immediately after vegetation removal, with the two-foot buffer (cleared of vegetation) remaining between fencing and existing vegetation. The fence will consist of silt fencing (or similar material) and will be buried to a minimum depth of two inches so that mice cannot crawl under the fence. Fence height will be at least one foot higher than the highest adjacent vegetation, with a minimum height of two feet. All supports for the exclusion fencing will be placed on the inside of the work area. The fencing will be immediately removed upon project completion.

Prior to the start of daily construction activities, the Qualified Biological Monitor will inspect the exclusion fencing to ensure that it is functional (e.g., has no rips or tears and remains buried in the ground). The fenced area(s) will also be inspected to ensure that no mice are trapped there. Any mice suspected to be salt marsh harvest mice that are found along and outside the fence will be closely monitored until they move away from the construction area.

To prevent potential entrapment of salt marsh harvest mice in work equipment, pipes or similar objects located in salt marsh harvest mouse habitat will be capped prior to the end of the workday and then inspected by the biological monitor prior to commencement of work activities the following day.

Work in or immediately adjacent to vegetated marsh areas, as identified by the Qualified Biological Monitor, will be scheduled to avoid extreme high tides because protective cover for mice is limited at this time. Specifically, no work will occur two hours before or after extreme high tides as directed by the Qualified Biological Monitor for 6.0 feet National Geodetic Vertical Datum (NGVD) or above, as measured at the Golden Gate Bridge, or adjusted to the timing of local extreme high-tide events in which the marsh plain is flooded.

Significance after Mitigation: Implementation of Mitigation Measures 3.3-1, 3.3-1b, 3.3-1c, 3.3-1d, 3.3-1e, 3.3-1f, and 3.3-1g would avoid and minimize both direct and indirect significant project impacts on special-status plants, aquatic species, and terrestrial wildlife as described in detail in the impact analysis above. The impact to special-status species would be less than significant with mitigation.

	Significance Determination
Impact 3.3-2: The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Direct Impacts

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Approximately 0.55 acre of riparian habitat are present within the project in Unit 4 upstream of the existing Denil fish ladder. To avoid and minimize impacts on riparian habitat, the geographic extent of adverse effects on vegetation related to project construction is limited to the construction footprint and the immediate vicinity of the project. Construction activities including vegetation removal, removal of 21 trees, grading, and installation of streambed stabilization measures will temporarily impact 0.54 acre of riparian habitat and permanently impact 0.01 acre of riparian habitat. Areas of temporary impacts will be revegetated with native riparian species through the installation of native plantings. The impact on riparian habitat would be significant if the riparian planting was not successful, causing a net reduction in riparian habitat. The District would implement **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan** to avoid significant impacts on riparian habitat. Mitigation Measure 3.3-2a requires a Habitat Restoration and Monitoring Plan to ensure successful establishment of the proposed habitat restoration in the project area. Impacts would be less than significant with mitigation.

In addition, sensitive natural communities may be present in the riparian areas where construction activities may be performed; without surveys to document these communities and measures to adequately protect them, they would be removed and/or degraded. The removal of sensitive natural communities would be a significant impact. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**, **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan**, and **Mitigation Measure 3.3-2b: Tree Mitigation**. Mitigation Measure 3.3-1a requires identification of any sensitive natural communities prior to construction and either avoidance of sensitive natural communities with a minimum 10-foot buffer or minimized disturbance; Mitigation Measure 3.3-2a requires the development and implementation of a Habitat Restoration Monitoring Plan to restore native riparian habitat; and Mitigation Measure 3.3-2b requires mitigation for removal of any native trees. Impacts would be less than significant with mitigation.

Unit 3 Frederick Allen Park

Approximately 1.48 acres of urban/developed habitat are present within Unit 3. The vegetation within Frederick Allen Park consists of ornamental plantings that are maintained as part of the urban park setting, which are separated from the creek by a 10-foot-tall concrete floodwall; however, CDFW considers the trees within the park to be part of the riparian zone because of the proximity of the trees to Corte Madera Creek. Construction activities including vegetation removal, removal of trees (i.e., 113 trees if the USACE does not require a 15-foot setback from new floodwalls or 144 trees if the USACE requires a 15-foot setback from new floodwalls), fence installation, and excavation and grading will have 0.78 acre of temporary impacts to the park's ornamental plantings and no permanent impacts. The impacted vegetation is currently separated from the creek by a 10-foot-tall concrete wall and does not contribute to habitat in the creek. Areas of temporary impacts will be revegetated with fast-growing willows, alders, and other riparian vegetation to establish riparian habitat adjacent to the creek to provide shade over the channel (see planting plan in Appendix B). The impact on riparian habitat will be

beneficial due to the removal of the concrete channel, creation of native riparian habitat, and reconnection of the creek to its revegetated floodplain.

The construction in Frederick Allen Park will require removal of 68 oak trees. Oak trees are sensitive due to the loss of oak woodlands throughout the state. Even if the oaks are not within habitat defined as a sensitive natural community, the oak trees are considered sensitive within the context of CEQA and are protected under Public Resources Code Section 21083.4. The planting within Frederick Allen Park includes a limited number of oak trees because the created habitats will be riparian and there will be limited area for planting of upland oak trees. The loss of oak trees will be significant. The District would implement **Mitigation Measure 3.3-2b: Tree Mitigation** to avoid significant impacts on oak woodlands. Mitigation Measure 3.3-2b specifies the criteria for mitigation of oak trees and requires replanting of oak trees at a minimum ratio of 4:1 and up to 15:1 based on CDFW guidance. The impact on oak woodland would be less than significant with mitigation.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station

Riparian and ornamental trees occur in the areas where the new floodwall segments will be installed in Units 3 and 2 and within the construction footprint for the stormwater pump station. Construction activities for the stormwater pump station, including vegetation clearing and grubbing, will result in the removal of eight trees. If the floodwall is constructed as an extension of the existing channel wall, no trees may need to be removed. If the USACE requires a setback floodwall or a 15-foot setback from the existing wall to the nearest tree, then construction activities for floodwall construction would result in the removal of up to 157 native and non-native trees. Removal of trees, including up to 50 oak trees, would result in a significant impact on oak woodlands. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-2b: Tree Mitigation.** Mitigation Measure 3.3-2b requires compensatory mitigation of trees that need to be removed as a part of the project, including mitigation planting of oak trees at a minimum 4:1 ratio. The impact on oak woodlands would be less than significant with mitigation.

Unit 2 Lower College of Marin Concrete Channel Removal

Approximately 0.23 acre of coastal brackish marsh, which is a sensitive natural community, is present within the area where the concrete channel will be removed in Unit 2. Construction activities including vegetation clearing, the removal of 39 trees, fence installation, concrete removal, and grading will have 0.11 acre of temporary impact and 0.12 acre of permanent impact on coastal brackish marsh. The concrete channel removal will result in the creation of approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats, resulting in a net increase in riparian and tidal marsh communities. Areas of temporary impacts will be revegetated with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. However, sensitive natural communities may be present in the coastal brackish marsh where construction activities may be performed; without surveys to document these communities and measures to adequately protect them, they would be removed and/or degraded. The removal of sensitive natural communities would be a significant impact. To

avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities** and **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan**. Mitigation Measure 3.3-1a requires identification of any sensitive natural communities prior to construction and either avoidance of sensitive natural communities with a minimum 10-foot buffer or compensatory mitigation; Mitigation Measure 3.3-2a requires the development and implementation of a Habitat Restoration Monitoring Plan to restore impacted native vegetation. Impacts would be less than significant with mitigation. Ultimately, the proposed project is anticipated to have a beneficial impact on riparian habitat and tidal marsh communities in lower Corte Madera Creek.

Indirect Impacts

Indirect damage or degradation to riparian habitat and/or sensitive natural communities could result from construction activities introducing invasive plant species or pathogens to the project site. Invasive plant species could spread between construction areas as well as from outside the project. Invasive plant species could also colonize recently disturbed graded soils. Marsh, riparian, and upland native vegetation would be planted along the creek banks to restore native habitats, and areas of temporary construction disturbance would be reseeded with a native seed mix, both of which would help prevent the establishment of invasive plant species. However, the revegetation effort may adversely affect habitat by introducing nonnative plant species. In addition, construction vehicles or equipment could carry invasive plant seeds or pathogens into the work area. Introduction of invasive plant species could cause degradation of riparian habitat and/or sensitive natural communities, which would result in a significant impact. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of equipment and use of weed-free seed and revegetation material to avoid introduction of invasive plants. The impact would be less than significant with mitigation.

Operation and Maintenance

As the vegetation management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and immature trees that have colonized and recruited within the channel, the impact of operation and maintenance activities on riparian habitat or sensitive natural communities is less than significant. Improved public access from Frederick Allen Park to the creek and adjacent riparian areas could result in trampling riparian habitat or sensitive natural communities. Without measures to educate the public, the habitat could be impacted or degraded. Several project elements will minimize this potential impact, including (1) the short wall or fence that will be installed for safety at the top of the creek bank, which will help prevent inadvertent access; (2) educational signs that will be installed, which will educate the public about the importance of riparian areas and need to keep out of restored habitats; and (3) trash receptacles that will be placed in Frederick Allen Park, which will reduce the amount of trash that could enter the restored habitats. The impact on riparian habitat and sensitive natural communities would be less than significant.

Mitigation: Implement Mitigation Measure 3.3-1a, Mitigation Measure 3.3-1e, Mitigation Measure 3.3-2a, and Mitigation Measure 3.3-2b.

Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan. The District shall prepare a Habitat Restoration and Monitoring Plan for revegetation prior to construction activities as detailed herein. The plan shall describe any required salvage and replanting protocols prior to and after construction is complete. The plan shall include, but not be limited to, protocols for replanting of vegetation removed prior to or during construction and management and monitoring of the plants to ensure replanting success pursuant to the most stringent requirements included in permits issued for the project. At a minimum, impacted trees greater than or equal to six inches diameter at breast height (dbh) shall be mitigated at a minimum of 1:1 replacement for nonnative tree species and 3:1 replacement for native tree species. Monitoring and any necessary maintenance of revegetated areas shall occur for a minimum of ten years.

The plan shall include procedures to achieve the following performance criteria and additional requirements of permits from the various resource agencies with regulatory purview over the project. At a minimum, replanted woody trees and shrubs shall have a minimum of 85 percent survival and vegetative cover shall be a minimum of 80 percent after five years of monitoring. Invasive species cover shall not exceed 1 percent. Additional monitoring shall be conducted if the revegetated areas do not meet the performance criteria in year five; any replacement plants shall be monitored with the same survival criteria for five years after planting.

Areas impacted by construction-related activity shall be replanted or reseeded with native trees, shrubs, and herbaceous perennials and annuals from the watershed under guidance from a qualified biologist. Local plant materials shall be used for revegetation of the disturbed area. The plant materials shall include local cuttings from the local watershed or from adjacent watersheds. Seeds shall be collected during the appropriate season, and the container plants shall be of an appropriate size for out-planting.

The Habitat Restoration and Monitoring Plan shall also address restoration of jurisdictional wetlands and waters. Temporary impacts to wetlands shall be restored on site with native wetland species under guidance from a qualified biologist. Permanent impacts to jurisdictional wetlands shall be mitigated for by replacement on or off site at a minimum 1:1 ratio or whatever more stringent requirements are included in the permits to be issued for the project.

The monitoring plan shall include annual monitoring of restored areas for at least five years. The plan shall contain vegetation management protocols, protocols for monitoring replanting success, and an adaptive management plan if success criteria are not being met. The adaptive management plan would include interim thresholds for replanting success and alternative management approaches, such as weed control, supplemental watering, or additional replanting to undertake if thresholds are not met.

Mitigation Measure 3.3-2b: Tree Mitigation. To mitigate for removal of any native trees in the project area or any trees greater than or equal to 6 inches located within the riparian corridor, the District shall replant trees on site, to the extent possible. The District will identify other suitable locations within the watershed if the project area is not large enough to support the replacement of all trees required for mitigation. If suitable mitigation sites are not located within the watershed, then additional sites will be identified within the County or beyond. All mitigation sites shall be coordinated with and approved by resource agencies. Alternatively, the District may contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code to the extent allowed by CDFW. Mitigation ratios shall be developed in coordination with the relevant resource agencies (i.e., CDFW and RWQCB) and the Town of Ross and shall vary according to both the type of tree impacted (i.e., tree species, whether or not the impacted tree is native to California or nonnative, and tree size) and the location of the mitigation planting (i.e., trees planted outside of the watershed may be subject to higher mitigation ratios). Impact mitigation ratios shall be a minimum of 1:1 for nonnative tree species to 3:1 for most native tree species or on a trunk-diameter basis per the Town of Ross Municipal code (i.e., 1:1 trunk diameter for trees in good or excellent condition [e.g., one 21-inch tree removed in good condition shall be replaced by new trees totaling 21-inch trunk diameter], 3:1 trunk diameter for trees in fair or marginal condition [e.g., one 21-inch tree removed in fair condition shall be replaced by new trees totaling 7-inch trunk diameter], and trees in poor condition shall be replaced with tree[s] totaling two inches in truck diameter), whichever is greater. Impact mitigation ratios for oak trees are expected to range from 4:1 (for impacted oak trees that are 5 to 10 inches dbh) to 5:1 (for impacted oak trees that are 10 to 15 inches dbh) and 15:1 (for impacted oak trees greater than 15 inches dbh).

The District shall prepare a detailed Tree Mitigation Plan and obtain approval from CDFW for the Tree Mitigation Plan. Replacement oaks shall come from nursery stock grown from locally sourced acorns or from acorns gathered locally, preferably from the same watershed in which they are planted. The trees should be able to survive the last two years of the minimum five-year monitoring period without supplemental irrigation. If at any time the District identifies additional trees that need to be removed, the District shall first get written approval from CDFW, RWQCB, and the Town of Ross and the District shall revise the final plan to include additional tree plantings in accordance with agency-approved mitigation ratios. Based on final total of trees impacted by the project, the plan shall include the details of the number and species of trees to be planted, specific planting locations, maintenance and irrigation needs, monitoring requirements (i.e., five years monitoring plant vigor and growth), reporting requirements, and success criteria to be met before monitoring is concluded (e.g., survival rates, assessment of "good" overall tree vigor, and tree viability without irrigation). The plan shall be submitted to resource agencies for review and approval prior to implementation.

Significance after Mitigation: The mitigation measures would avoid loss of sensitive natural communities, address potential indirect impacts from introduction of invasive weeds, ensure successful restoration of riparian areas, and offset impacts on oak trees. Impacts would be less than significant with mitigation.

	Significance Determination
Impact 3.3-3: The project would not have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Direct Impacts

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Protected wetlands occur as waters below the ordinary high-water mark in the creek in Unit 4 upstream of the existing Denil fish ladder. Construction activities including grading and installation of streambed stabilization measures, rip-rap, short cast-in-place concrete walls adjacent to existing concrete walls, engineered streambed material, and creek-toe protection as well as channel dewatering during construction will temporarily impact 0.36 acre of waters and permanently impact 0.04 acre of waters. Areas of temporary impacts will return to waters upon the completion of construction, and areas of permanent impacts will be offset both by the channel deepening and widening activities (i.e., lower channel floor elevations and approximately 115 feet of widened channel to increase hydraulic conveyance capacity) and planting with wetland-appropriate species, such that the project would result in no net loss of wetlands (or waters) within Unit 4. Due to the temporary nature of project impacts lasting only a few months the project work in Unit 4 would not result in permanent loss of wetlands, the impact on protected wetlands would be less than significant.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., concrete and planted rock) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification from the RWQCB. These agencies' policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Unit 3 Frederick Allen Park

The concrete channel adjacent to Frederick Allen Park includes waters but no vegetated wetland areas. Construction activities including concrete wall and channel removal as well as channel dewatering during construction will temporarily impact 0.13 acre of waters. Areas of temporary impacts will return to waters upon the completion of construction, and impacts from the replacement of the concrete channel with natural substrate would widen the channel along the left and right banks, create a low bar or bench inundated by floods, provide a new floodplain bench, and improve aquatic habitat in the larger Corte Madera Creek watershed over the long term such that the project would result in no permanent loss of wetlands within Unit 3

and an overall increase in wetlands. Therefore, Unit 3 restoration is anticipated to have a beneficial impact on protected wetlands.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., channel widening, floodplain bench) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification from the RWQCB. These agencies' policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Unit 3 Fish Pool Construction
The concrete channel in Unit 3 includes waters but no vegetated wetland areas. Construction activities including the addition and enlargement of 11 fish-migration resting pools as well as channel dewatering during construction will temporarily impact 1.74 acres of waters and permanently impact 0.06 acre of waters. Areas of temporary impacts (i.e., dewatering) will return to waters upon completion of construction. Areas of permanent impacts associated with the fish pools are associated with concrete removal and will expand the waters by 0.01 acre such that the project would result in no permanent loss of wetlands within Unit 3 and an overall increase in wetlands. The impact on protected wetlands would be beneficial.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., concrete and planted rock) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification from the RWQCB. These agencies' policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station
The Unit 3 and Unit 2 floodwalls and the stormwater pump station are located in upland areas. No wetlands occur within the construction area for the floodwalls or stormwater pump station. Therefore, there would be no impact on protected wetlands from these activities.

Unit 2 Lower Corte Madera Creek (Phase 2)
Protected wetlands occur as waters below the high-tide line in the creek in Unit 2. Construction activities including concrete channel removal, channel wall removal, and grading as well as channel dewatering during construction will temporarily impact 1.51 acres of waters and permanently impact 0.05 acre of waters, including brackish marsh. Areas of temporary impacts will return to wetlands upon the completion of construction. Areas of permanent impacts will create approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats within the ruderal upland and/or urban areas currently present at this location, such that the project would result in no permanent loss of wetlands within Unit 2 and an overall increase in wetlands. The impact on protected wetlands would be beneficial.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., grading, channel widening, concrete removal) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification

from the RWQCB. These agencies policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Indirect Impacts

Indirect damage or degradation to protected wetlands could result from increased turbidity or other impacts related to water quality during construction. The project would disturb more than 1 acre and is required to obtain a Construction General Permit and prepare a Stormwater Pollution Prevention Plan (SWPPP), which would identify best management practices for reducing construction water quality impacts, such as erosion and sediment control measures. Indirect impacts to wetlands could occur from introduction of invasive species to wetland habitats. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of equipment to avoid introduction of weed seed on vehicles and planting with weed-free materials to avoid introduction of invasive weeds through vegetation plantings. Impacts from invasive-species introduction to wetlands would be less than significant with mitigation.

Operation and Maintenance

As the vegetation management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and trees, maintenance of the project would not impact protected wetlands. No routine maintenance, other than potential removal of storm flow or other man-made debris in lower College of Marin concrete channel removal area and, potentially, sediment and debris removal from fish pools is anticipated. The project would create new wetland habitats within Frederick Allen Park where the concrete channel is removed and riparian vegetation is planted and within the lower College of Marin concrete channel removal area where new salt marsh wetlands would be created. This impact would be beneficial because the project would result in a net increase in wetlands. Therefore, the impact on protected wetlands from operation and maintenance is less than significant.

Mitigation: Implement Mitigation Measure 3.3-1e.

Significance after Mitigation: Mitigation Measure 3.3-1e defines procedures to avoid introduction of invasive weeds in site construction and restoration activities. Indirect impacts on wetlands would be less than significant with mitigation.

	Significance Determination
Impact 3.3-4: The project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant with Mitigation

Construction

Aquatic Species Movement and Nursery Sites

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Unit 4 work includes removal of the inoperable fish ladder and grading to create a smooth transition between Unit 3 and Unit 4. This work will require installation of cofferdams and dewatering of the channel, which will temporarily inhibit migration and use of the reach for rearing by salmonids. However, instream construction will occur from June 15 to October 15, which is after the juvenile smolting migration and prior to the arrival of adult salmonids in the fall. Fish would be able to return to the improved Unit 4 and post-fish ladder reach upon completion of construction. In addition, removal of the fish ladder will improve upstream and downstream migration and rearing habitat for salmonid species in the long term. Because the work would occur during periods when fish are not migrating, and the result would be to improve fish passage, this activity would have a less-than-significant impact on migratory fish or use of nursery sites.

Unit 3 Frederick Allen Park

The concrete channel adjacent to Frederick Allen Park currently presents a migration challenge for upstream migrating adult salmonids and downstream juveniles. This reach does not provide nursery habitat for aquatic species. Demolition of the concrete channel adjacent to the park and reconstruction of a natural channel will require dewatering, which will temporarily inhibit migration by salmonids. However, instream construction will occur from June 15 to October 15, which is after the juvenile smolting migration and prior to the arrival of adult salmonids in the fall. In addition, the restoration of the natural channel will improve upstream and downstream migration for salmonid species. This activity would have a less-than-significant impact on migrating fish.

Unit 3 Fish Pool Construction

Up to 11 larger fish pools would be constructed in lower Unit 3 downstream of Frederick Allen Park. This work would require dewatering, which will temporarily inhibit migration by salmonids. However, instream construction will occur from June 15 to October 15, which is after the juvenile smolting migration and prior to the arrival of adult salmonids in the fall. In addition, the construction of the fish pools will improve upstream and downstream migration for salmonid species. This reach does not provide nursery habitat for aquatic species. Therefore, this activity would have a less-than-significant impact on movement of migratory fish.

Unit 3 and Unit 2 Floodwall and Stormwater Pump Station

These activities would occur outside of the channel. There would be no impact on the movement of migratory fish.

Unit 2 Lower College of Marin Concrete Channel Removal

This portion of the project would remove the existing concrete channel walls and reconstruct natural streambanks. These activities would require installing a cofferdam and dewatering the channel, which would temporarily inhibit movement of migratory fish. This reach does not provide nursery habitat for anadromous salmonids but can be seasonally used by steelhead smolts as they transition from a freshwater to saltwater physiology prior to ocean entry. The construction is scheduled to occur between September and October 15 to avoid the fish

migration and smolt-transformation periods. The impact on fish migration and nursery habitat would be less than significant.

Wildlife Movement

The project is not expected to interfere substantially with the movement of any native resident wildlife species or with established native resident or migratory wildlife corridors. Larger animals, such as deer and coyote, are unlikely to make seasonal or life-cycle-driven movements through the project area beyond occasional dispersal movements of young animals. The project area provides habitat for localized wildlife movement and dispersal opportunities for wildlife that use the surrounding urban landscape, which is expected to remain unchanged.

Use of Native Wildlife Nursery Sites

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Non-listed migratory birds or raptors could establish nests in riparian woodlands, which is the primary vegetation community in Unit 4 upstream of the existing Denil fish ladder. The nesting season for migratory birds and raptors is generally from February 1 to August 31. Up to 21 trees would be removed in Unit 4. Direct effects on avian nursery sites may include nest abandonment or premature fledging resulting from construction-related noise, vibration, and visual disturbance. Impacts on nesting birds would be significant if nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on migratory birds and raptors. This impact on nesting migratory birds and raptors would be less than significant with mitigation.

Twenty-one would be removed, and any trees removed from the riparian area would be replaced. The alteration of riparian habitat would not result in a substantial decrease in available nesting habitat for migratory birds and raptors. The indirect impact on nesting migratory birds and raptors would therefore be less than significant.

Unit 3 Frederick Allen Park

Frederick Allen Park is relatively narrow, heavily used by the public, and likely subject to heavy bird-nest predation pressures from corvids (e.g., crows and jays) that are attracted by human use and trash. Nevertheless, non-listed migratory birds or raptors could establish nests in trees slated for removal as part of the project. Impacts on nesting birds would be significant if an active nest tree is removed, or nesting is abandoned because of the increased activity associated with construction. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on nursery sites for nesting migratory birds and raptors. This impact on nesting migratory birds and raptors would be less than significant with mitigation.

The removal of 144 trees from Frederick Allen Park may further reduce nesting opportunities for migratory bird species. The removal of these trees would also increase the potential for edge-effect predation on nests in retained trees. The planting of native riparian vegetation (e.g., willows and alders) along the channel would improve overall habitat conditions for nesting birds by replacing non-native and ornamental landscaping trees with native habitats for nesting birds. The project includes a planting plan (Appendix B) that would revegetate the Frederick Allen Park area with between 88 and 125 trees, depending on whether a 15-foot setback is required from the floodwall. Up to 750 trees would also be planted off site to help offset tree removal and improve native nesting habitat in other areas (**Mitigation Measure 3.3-2b: Tree Mitigation**). Several of the trees that would be removed from Frederick Allen Park are currently unhealthy and many are nonnative and provide more limited habitat value than the trees that are proposed as part of the planting plan. The impact on nursery sites for migratory species from tree removal is less than significant with mitigation.

Unit 3 Fish Pool Construction
These activities would occur inside the concrete channel. There would be no impact on nursery sites for terrestrial birds.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station
Non-listed migratory birds or raptors could establish nests in trees slated for removal as part of the Unit 3 and Unit 2 Floodwall and Stormwater Pump Station. Impacts on nesting birds would be significant if nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on migratory birds and raptors. This impact on nesting migratory birds and raptors would be less than significant with mitigation.

The project would remove up to 165 trees depending on the approved design for the floodwall in Units 3 and 2, the required setbacks from each floodwall, and construction of the stormwater pump station. The loss of up to 165 trees could result in a significant impact on available native wildlife nursery sites for native migratory birds and raptors. The District would implement **Mitigation Measure 3.3-2b: Tree Mitigation** to ensure adequate mitigation for tree removal, including replacement of trees removed at a minimum 1:1 ratio and higher, depending on the tree. The planting of native riparian vegetation would improve nesting habitat by replacing many non-native and ornamental trees with tree species that provide higher-quality nesting habitat. This impact is therefore less than significant with mitigation.

Unit 2 Lower College of Marin Concrete Channel Removal
The pile driving and concrete removal associated with this element of the project would occur after August 31 to avoid impacts on bird nesting areas. Therefore, impacts on nesting would be less than significant.

The project would remove up to 39 trees to facilitate the concrete channel removal. The loss of up to 39 trees could result in a significant impact on available native wildlife nursery sites for native migratory birds and raptors. The District would implement **Mitigation Measure 3.3-2b: Tree Mitigation** to ensure adequate mitigation for tree removal, including replacement of trees removed at a minimum 1:1 ratio and higher, depending on the tree. The planting of native riparian vegetation would improve nesting habitat by replacing many non-native and ornamental trees with tree species that provide higher-quality nesting habitat. This impact is therefore less than significant with mitigation.

Work within the existing wetland would result in the creation of approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats within the ruderal upland and/or urban areas currently present at this location. This would result in an increase of potential salt marsh harvest mouse nursery habitat at this location. Therefore, this impact would be beneficial.

Operation and Maintenance

Operation and maintenance work would occur primarily within Units 3 and 2. Work within the channel would be limited to vegetation and sediment management. These activities would coincide with the low-flow period and would be very similar to the existing sediment removal and vegetation management activities conducted by the District in the project area and throughout the watershed. This impact would be less than significant.

> **Mitigation:** Implement Mitigation Measure 3.3-1d and Mitigation Measure 3.3-2b.
>
> **Significance after Mitigation:** Mitigation Measure 3.3-1d defines avoidance buffers for tree removal to avoid disruption of bird nesting activities. Mitigation Measure 3.3-2b ensures successful restoration of riparian areas and offsets impacts on oak trees. Impacts would be less than significant with mitigation.

	Significance Determination
Impact 3.3-5: The project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

The objective of the project includes community flood risk reduction with the added benefits of improved fish passage, natural creek processes, and fish and riparian habitat adjacent to the Corte Madera Creek. The project is generally aligned and in conformance with the goals, policies, and codes described in the Marin Countywide Plan, Marin County Municipal Code, Town of Ross General Plan, and Town of Ross Municipal Code (See Section 3.3.4 for details regarding the specific goals, policies, and codes). The project would require removal of up to 165 trees (37 protected and 50 significant trees per the Municipal Code) within the Town of Ross. The District would be planting 89 to 125 trees in Frederick Allen Park. The project would also require removal of up to 47 protected or heritage trees within the unincorporated County. Although the District is exempt from obtaining a County permit for tree removal, the District

would voluntarily comply with County regulations regarding tree removals and replanting. The District would be required to obtain a tree removal permit from the Town of Ross and provide replacement trees as specified in the Town of Ross Municipal Code. The District would also be required to prepare a Tree Protection Plan as part of the Design Review process. The Tree Protection Plan would include a certified arborist's report on the existing trees in the project area that could be affected by project construction and a plan for protecting existing trees during construction. Because the District would obtain a tree removal permit and prepare a Tree Protection Plan in compliance ~~and comply~~ with the Town of Ross tree protection ordinance, the impact from conflict with Town of Ross ordinance for the protection of biological resources would be less than significant. Because the District is exempt from the County tree protection ordinance and would voluntarily comply with the replanting requirements in the tree protection ordinance, the project would not conflict with any policy or ordinance for the protection of biological resources. The impact from conflict with a policy or ordinance for the protection of biological resources is therefore less than significant.

While the impact from conflict with a policy or ordinance for the protection of biological resources would be less than significant, the requirements of **Mitigation Measure 3.3-2b: Tree Mitigation** include tree replacement to comply with both Town of Ross and Marin County guidelines. The mitigation provides further guarantee that the project would not conflict with the Town of Ross or Marin County tree protection ordinances.

Operation and Maintenance

The project would create higher-value habitats that are consistent with the goals and policies for biological resources in the Town of Ross and Marin County. Project operation and maintenance will not require tree removal and will not conflict with any policies or ordinances protecting biological resources. No impact would occur.

Mitigation: None required.

	Significance Determination
Impact 3.3-6: The project would not introduce a new non-native or invasive species of plant or animal into an area.	**Construction: Less Than Significant with Mitigation**
	Operation and Maintenance: No Impact

Construction

Project construction could create a favorable environment for invasive non-native species that are highly competitive in disturbed environments. Unintentional introduction of non-native plant or animal species is also possible. Project activities would involve clearing, grubbing, in-water work, and excavation and grading using heavy equipment that could carry invasive non-native species or pathogens from outside sources to the project sites.

Plants

Introduction of new non-native or invasive plant species could result from construction activities. Invasive plant species could spread between construction areas as well as from

outside the project. Invasive plant species could also colonize recently disturbed graded soils. Riparian vegetation would be planted to restore native habitats, and areas of temporary construction disturbance would be reseeded with a native seed mix, both of which would help prevent the establishment of invasive plant species. However, the revegetation effort may adversely affect habitat by introducing nonnative plant species and/or pathogens on construction vehicles or equipment, which would be a potentially significant impact on special-status plant species or habitat. Establishment of invasive plants would be a significant impact. To avoid or minimize this significant impact, the District would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of equipment prior to construction and use of weed-free planting materials. The impact would be less than significant with mitigation.

Aquatic species

Corte Madera Creek is currently infested with New Zealand mud snails, which are a non-native invasive aquatic gastropod. This species might have been introduced by adhering to untreated fishing waders, kayaks, or other surfaces that were first used in infested waters and then introduced to Corte Madera Creek. Introduction of invasive aquatic species to the project area during construction and transferring species to other waterbodies after completion would be a significant impact. The District would implement **Mitigation Measure 3.3-6: Invasive Aquatic Species Control** to avoid significant impacts from invasive aquatic species. Mitigation Measure 3.3-6 defines specific requirements to ensure construction equipment and materials are free of invasive aquatic species. The impact from invasive aquatic species would be less than significant with mitigation.

> **Mitigation Measure 3.3-6: Invasive Aquatic Species Control.** All heavy equipment that has operated in waters outside of the Corte Madera Creek watershed shall be steam-cleaned and inspected prior to entering the project area. Any in-channel equipment that could be used in other water bodies will be decontaminated following the completion of the project. In addition, all waders, wading boots, block nets, dip nets, and buckets used within Corte Madera Creek will undergo decontamination. Decontamination protocols will include:
>
> - Freeze equipment/gear for a minimum of 8 hours at temperatures at 26°F (-3°C) or below.
> - Soak equipment/gear in a bath of hot water (at least 120°F, 46°C) for 10 minutes.
> - Soak equipment/gear in a bath of a disinfectant containing quaternary ammonium compounds (QAC) (e.g., Quat 4, Quat 128, Super HDQ Neutral, etc.) for 10 minutes. The QAC-containing disinfectant should be diluted with water at a rate to achieve a minimum active QAC concentration of 0.4%. Six (6) ounces of disinfectant to gallon of water can be used as a disinfectant to water ratio (1:21). After removal from the bath, rinse equipment/gear thoroughly with tap water.

Operation and Maintenance

Plants

The project management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and trees. These activities would be beneficial to the control of non-native and invasive plant species. The operation and maintenance would not increase the frequency of work in Corte Madera Creek or create other factors that could introduce non-native invasive species to terrestrial environments. No impact would occur from introduction of invasive species.

Aquatic species

As stated above, Corte Madera Creek is currently infested with New Zealand mud snails, which are a non-native invasive aquatic gastropod and have the potential to infest other waters. Any equipment used for operations and maintenance that enters the wetted perimeter of the creek shall be decontaminated using the procedures listed in **Mitigation Measure 3.3-6: Invasive Aquatic Species Control**. Implementation of Mitigation Measure 3.3-6 would result in this impact being less than significant with mitigation. Mitigation: Mitigation Measure 3.3-6.

> **Mitigation:** Implement Mitigation Measure 3.3-6.
>
> **Significance after Mitigation:** Mitigation Measure 3.3-6 requires cleaning of construction equipment prior to entering Corte Madera Creek. This measure also requires decontamination of waders and other materials used in the creek upon completion of operations and before transfer to other areas to avoid introduction and spread of invasive aquatic species. Impacts would be less than significant with mitigation.

3.3.7 References

A. A. Rich and Associates. (2000, November). Fishery Resources Conditions of the Corte Madera Creek Watershed, Marin County, California . Prepared for Friends of Corte Madera Creek Watershed, San Anselmo, CA.

Atkins North America, Inc. (2011, December 22). Biological Resources Constraints memorandum Corte Madera Flood Control Project . San Diego, California.

Barnhart, R. A. (1986). Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest)—Steelhead. Biological Report 82 (11. 60). U. S. Fish and Wildlife Service.

Bulger, J. B., Scott, N. J., & Seymour, a. R. (2003). Terrestrial activity and conservation of adult California red-legged frogs (Rana aurora draytonii) in coastal forests and grasslands. Biological Conservation 110: 85–95.

Busby, P. J., Wainwright, T. C., Bryant, G. J., Lierheimer, L. J., Waples, R. S., Waknitz, F. W., & Lagomarsino, a. I. (1996). Status review of west coast Steelhead from Washington, Idaho, Oregon, and California. National Oceanographic and Atmospheric Administration

Technical Memorandum NMFS-NWFSC-27. National Marine Fisheries Service, Seattle, Washington. .

Cal-IPC. (2020). *California Invasive Plant Inventory*. Retrieved from Online database by California Invasive Plant Council, Berkeley, California: https://www.cal-ipc.org/plants/inventory/

Caltrans. (2016). Technical Guidance for Assessment and Mitigation of the Effects of Highway and Road Construction Noise on Birds. Guidance Manual Report Number CTHWANP-RT-15-306.04.2, Sacramento, California.

CDFW . (2020b). Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication. .

CDFW. (2010). Stream inventory report – Corte Madera Creek.

CDFW. (2018). *Protocols for surveying and evaluating impacts to special-status native plant populations and sensitive natural communities*. (S. C. California Natural Resources Agency, Producer) Retrieved October 2020, from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline

CDFW. (2020a). *Rarefind* , 5. Retrieved June and August 2020, from California Natural Diversity Database: https://www.wildlife.ca.gov/data/cnddb/maps-and-data

CDFW. (2020c, September). *List of California Sensitive Natural Communities. Vegetation Classification and Mapping Program, California Department of Fish and Game, Sacramento, California.* Retrieved from https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609&inline

CDFW. (2020d). *California endangered plant profile for white-rayed Pentachaeta (Pentachaeta bellidiflora)*. Retrieved September 2020, from https://wildlife.ca.gov/Conservation/Plants/Endangered/Pentachaeta-bellidiflora

City of San Francisco & CH2M HILL, 1985. (in Rosenfield and Baxter, 2007). Ocean outfall monitoring program: 1983-1984 anuual report. Bureau of Water Pollution Control, San Francisco. *Population dynamics and distribution patterns of Longfin Smelt in the San Francisco estuary*. Transactions of the American Fisheries Society 136:1577-1592.

CNPS. (2020a). Inventory of rare and endangered plants of California (online edition, v8-03 0.39). *Rare Plant Program*. Sacramento, California: California Native Plant Society .

CNPS. (2020b). *Manual of California Vegetation, Online Edition. California Native Plant Society, Sacramento, CA.* Retrieved September 2020, from http://www.cnps.org/cnps/vegetation/

Constantine, D. G. (1959). Ecological observations on lasiurine bats in the North Bay Area of California. Journal of Mammalogy 40: 13–15.

Dunk, J. R. (1995). *White-tailed kite (Elanus leucurus). In A. Poole, editor. The Birds of North America Online. Cornell Lab of Ornithology*. Retrieved from http://bna.birds.cornell.edu/bna/species/178/articles/introduction

eBird. (2020). *eBird: An online database of bird distribution and abundance*. Retrieved September 2020, from https://ebird.org/home

Erichsen, A. L. (1995). The white-tailed kite (Elanus leucurus): nesting success and seasonal habitat selection in an agricultural landscape. Master's thesis. . University of California at Davis.

Everest, F. H. (1973). Ecology and management of summer Steelhead in the Rogue River. Fishery Research Report No. 7. Oregon State Game Commission, Corvallis. .

Fellers, G. M., & Kleeman, a. P. (2007). California red-legged frog (Rana draytonii) movement and habitat use: implications for conservation. Journal of Herpetology 41: 271–281.

FHWG. (2008, June 12). Agreement in principal for interim criteria for injury to fish from pile driving Activities. Memorandum dated June 12, 2008. . Retrieved from http://www.dot.ca.gov/hq/env/bio/files/fhwgcriteria_agree.pdf

Friends of Corte Madera Watershed. (2004, May). Fish and Wildlife in the Corte Madera Creek Watershed.

Gardali, T., & Evens, a. J. (2008). San Francisco common yellowthroat (Geothlypis trichas sinuosa). 246-350. (e. W. D. Shuford and T. Gardali, Ed.) Western Field Ornithologists, Camarilla, California and California Department of Fish and Game, Sacramento, California.

Gertsch, M., DeWater, D. V., & Walton, a. B. (1994). American peregrine falcon. In C. G. Thelander and M. Crabtree, editors. Life on the edge: a guide to California's endangered natural resources: wildlife. Biosystems Books, Santa Cruz, California.

Hermanson, J. W., & O'Shea, a. T. (1983). Antrozous pallidus. Mammalian Species 213: 1–8.

Holland, D. C. (1994). The western pond turtle: habitat and history. Final Report. U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon.

Holland, R. (1986). Preliminary descriptions of the terrestrial natural communities of California. Sacramento, California: Unpublished document. California Department of Fish and Game, Natural Heritage Division.

iNaturalist. (2020). Retrieved September 2020, from https://www.inaturalist.org

Jennings, M. R., & Hayes, a. M. (1994). Amphibian and reptile species of special concern in California. Final Report. California Academy of Sciences, Department of Herpetology, San Francisco, and Portland State University, Department of Biology, Portland, Oregon

for California Department of Fish and Game, Inland Fisheriers Division, Rancho Cordova.

Leidy, R. A., & Leidy., a. G. (1984). Life stage periodicities of anadromous salmonids in the Klamath River Basin, northwestern California. U. S. Fish and Wildlife Service, Sacramento, California. .

Leidy, R. A., Becker, G., & Harvey., a. B. (2005). Historical status of coho salmon in streams of the urbanized San Francisco estuary, California. California Fish and Game 91(4):219-254.

Lewis, S. E. (1994). Night roosting ecology of pallid bats (Antrozous pallidus) in Oregon. American Midland Naturalist 132: 219–226.

Love, M. (2007). Corte Madera Creek Flood Control Channel Fish Passage Assessment and Alternatives Analysis. Prepared for Friends of Corte Madera Creek. Mike Love & Associates and Jeff Anderson & Associates, Arcata, California.

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

Marin County. (2020, November 16). Marin County Municipal Code. Retrieved from https://library.municode.com/ca/marin_county/codes/municipal_code

Marin County Community Development Agency . (2007). Marin Countywide Plan Final EIR. Retrieved from http://www.smwlaw.com/files/Marin_CountyWide_Plan.pdf

Marin County Community Development Agency. (2004, April). Marin County Watershed Management Plan Administrative Draft.

Marshall, J. T. (1948, in Spautz & Nur, 2008). Ecologic races of Song Sparrows in the San Francisco Bay region. Part I. Habitat and abundance. Condor 50:193–215.

MLA. (2019). Technical Memorandum - Potential Fish Passage Improvements in Corte Madera Creek Unit 3 by Adding New Resting Pools.

Moyle, P. B. (2002). Inland Fishes of California. Revised and Expanded. Univ. Calif. Press, Berkeley and Los Angeles, CA.

Nafis, G. (2018). California Herps – A Guide to the Amphibians and Reptiles of California.

NMFS. (2000). Endangered and threatened species: threatened status for one steelhead evolutionarily significant unit (ESU) in California. Federal Register 65: 36,074–36,094.

Nur, N., Zack, S., Evens, J., & Gardali, a. T. (1997). Tidal marsh birds of the San Francisco Bay region: status, distribution, and conservation of five Category 2 taxa. Draft Final Report of the Point Reyes Bird Observatory to the U.S. Geological Survey, Biological Resources Division.

Nussbaum, R. A., Brodie, J. E., & Storm, a. R. (1983). Amphibians and reptiles of the Pacific Northwest. University Press, Moscow, Idaho.

Oolofson Environmental. (2020). California Ridgway's Rail Surveys for the San Francisco Estuary Invasive Spartina Project 2019. Report to The State Coastal Conservancy. Retrieved from www.spartina.org/project.htm#rail

Pierson, E. D., & Fellers, a. G. (1998). Distribution and ecology of the big-eared bat, Corynorhinus townsendii in California. Prepared for U.S. Geological Service, Species at Risk Program.

Pierson, E. D., & Rainey, a. W. (2003). Inventory of bat species in Kings Canyon and Sequoia National Parks: 2002 surveys. Draft Contract Report. Prepared for National Park Service, Ash Mountain, California.

Pierson, E. D., & Rainey, a. W. (2007). Bat Distribution in the forested region of northwestern California. Prepared for California Department of Fish and Game, Sacramento, California.

Pierson, E. D., Rainey, W. E., & Corben, a. C. (2001). Seasonal patterns of bat distribution along an altitudinal gradient in the Sierra Nevada. Prepared for California Department of Transportation, California State University at Sacramento Foundation, yosemite Association, and Yosemite Fund.

Pierson, E. D., Rainey, W. E., & Corben, a. C. (~~2000~~ 2006). Distribution and status of red bats, Lasiurus blossevillii in California. Prepared for California Department of Fish and Game, Species Conservation and Recovery Program, Habitat Conservation Planning Branch, Sacramento.

Pierson, E. D., Rainey, W. E., & Miller, a. R. (1996). Night roost sampling: a window on the forest bat community in northern California. 151-163. (R. M. Brigham, Ed.) Bats and Forests Symposium, 19–21 October 1995. Victoria, British Columbia, Canada. Working Paper 23/1996. Research Branch, B.C. Ministry of Forests, Victoria, British Columbia.

Popper, A. N., Hawkins, A. D., Fay, R. R., Mann, D., Bartol, S., Carlson, T., . . . and Tavolga, W. N. (2014). W. N. Tavolga. 2014. Sound Exposure Guidelines for Fishes and Sea Turtles. A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 andregistered with ANSI.

Porter, R. D., White, C. M., & Erwin, a. R. (1973). The peregrine falcon in Utah, emphasizing ecology and competition with the prairie falcon. Brigham Young University Science Bulletin, Biological Series, Provo, Utah.

Reiser, D., & Bjornn, a. T. (1979). Influence of forest and rangeland management on anadromous fish habitat in the western United States and Canada. U. S. Department of Agriculture Forest Service Technical Report PNW-96.

Rosenfield, J. A., & Baxter, a. R. (2007). Population dynamics and distribution patterns of Longfin Smelt in the San Francisco estuary. Transactions of the American Fisheries Society 136:1577–1592.

Shaffer, H. B., Fellers, G. M., Voss, S. R., Oliver, J. C., & Pauly, a. G. (2004). Species boundaries, phylogeography and conservation genetics of the red-legged frog (Rana aurora/draytonii) complex. Molecular Ecology 13: 2667–2677.

Shellhammer, H. S., Jackson, R., Davilla, W., Gilory, A. M., Harvey, H. T., & Simons, a. L. (1982, in LSA, 2012). Habitat preferences of salt marsh harvest mice (Reithrodontomys raviventris). *Public Draft Solano County Habitat Conservation Plan. Prepared for the Solano County Water Agency*. The Wasmann Journal of Biology 40(1-2):102-114.

Sherwin, R., & Piaggio, a. A. (2005). Corynorhinus townsendii Townsend's big-eared bat. Species account developed for the Western Bat Working Group 1998 Reno Biennial Meeting. updated for the 2005 Portland Biennial Meeting. Western Bat Working Group, Rapid City, South Dakota.

Sherwin, R., & Rambaldini, a. D. (2005). Antrozous pallidus pallid bat. Species account developed for the Western Bat Working Group 1998 Reno Biennial Meeting; updated for the 2005 Portland Biennial Meeting.

Shump, K. A., & Shump, a. A. (1982). Lasiurus borealis . Mammalian Species 183: 1–6.

Spautz, H., & Nur, a. N. (2008). Samuels song sparrow (Melospiza melodia samuelis). 412-418. (W. D. Gardali, Ed.) Western Field Ornithologists, Camarilla, California and California Department of Fish and Game, Sacramento, California.

Stebbins, R. C. (2003). A field guide to western reptiles and amphibians. Third edition. Houghton Mifflin Company, Boston-New York.

Stillwater Sciences. (2020). Draft Preliminary Wetland Delineation for the Corte Madera Creek Flood Risk Management Project, Marin County, California. Prepared by Stillwater Sciences, Berkeley, California for Marin County Flood Control and Water Conservation District.

Taylor, Ross and Associates. (2006). Corte Madera stream crossing inventory and fish passage evaluation –final report. Prepared for Friends of Corte Madera Creek. McKinleyville, California.

Town of Ross. (2007, June). Town of Ross General Plan.

Town of Ross. (2018). Municipal Code. *Title 12 Chapter 12.24 Planting, Alteration, Removal or Maintenance of Trees*.

Town of Ross. (2020). *Municipal Code*. Retrieved July 29, 2020, from https://www.townofross.org/administration/page/municipal-code

Town of Ross, 2009. (in USACE 2010). Corte Madera Creek Flood Control Study Baseline Report .

USACE, 1987. (in Friends of Corte Madera Watershed, 2004, May). Fish and Wildlife in the Corte Madera Creek Watershed. .

USDA NRCS. (2020). *Agricultural Applied Climate Information System (AgACIS) climate data and summary report*. Retrieved August 2020, from National Water and Climate Center, National Weather Service Cooperative Observer Program: http://agacis.rcc-acis.org/

USFWS. (1984). Salt Marsh Harvest Mouse and California Clapper Rail Recovery Plan. U.S. Fish and Wildlife Service, Pacific Region, Portland, Oregon. 141 pp. Retrieved from http://ecos.fws.gov/docs/recovery_plan/841116.pdf

USFWS. (2002). Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for Holocarpha macradenia (Santa Cruz Tarplant). Federal Register, Volume 67 Number 200.

USFWS. (2010, February). Salt marsh harvest mouse (Reithrodontomys raviventris) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Sacramento Fish and Wildlife Office Sacramento, California. .

USFWS. (2012). Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the San Francisco Bay- Delta Population of the Longfin Smelt as Endangered or Threatened. Federal Register 77: 19756–19797.

USFWS. (2020). *Information for Planning and Consultation (IPaC): online project planning tool.* Retrieved July and August 2020, from https://ecos.fws.gov/ipac/

White, C. M., Clum, N. J., Cade, T. J., & Hunt, a. W. (2002). *Peregrine falcon (Falco peregrinus). In A. Poole, editor. The Birds of North America Online. Cornell Lab of Ornithology, Ithaca, New York.* Retrieved from http://bna.birds.cornell.edu/bna/species/660/articles/introduction

Zeiner, D. C., Laudenslayer, W. F., Mayer, J. K., & White, a. M. (1988-1990). California's Wildlife. Volumes I–III. California Department of Fish and Game, Sacramento, California. California Statewide Habitat Relationships System.

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3.4 Cultural Resources

3.4.1 Introduction

This section presents and discusses the cultural resources located within the project area. Included in this section are the environmental and regulatory settings, the significance criteria used for determining environmental impacts, potential impacts associated with the project, and, where applicable, mitigation measures that would reduce those impacts to a less-than-significant level.

3.4.2 Scoping Comments

Comments related to cultural resources impacts were received during the public scoping process. These comments and the location where they are addressed in the cultural resources EIR analysis are provided in Table 3.4-1.

Table 3.4-1 Cultural Resources Scoping Comments

Agency/Entity	Comment	Location in Cultural Resources Section that Comment is Addressed
California State Lands Commission	The Draft EIR should also mention that the title to all abandoned archaeological sites and historic or cultural resources on or in the submerged lands of California is vested in the state and under the jurisdiction of the Commission (Pub. Resources Code, § 6313). Commission staff requests that the District consult with Staff Attorney Jamie Garrett, should any cultural resources on State lands be discovered during construction of the proposed Project. In addition, Commission staff requests that the following statement be included in the EIR's Mitigation and Monitoring Plan: "The final disposition of archaeological, historical, and paleontological resources recovered on state lands under the jurisdiction of the California State Lands Commission must be approved by the Commission."	3.4.5 Impact Assessment Methodology
Garril Page	I combine these two headings [Cultural Resources/Tribal Cultural Resources] as I have commented extensively on these subjects in prior EIR, and EIR/EIS opportunities. Having been told the USACE and County have collected such materials for inclusion in the current EIR, I herewith incorporate those Comments by reference. If, in fact, the current consultants have found and read my prior Comments, they have been advised regarding historical, cultural and tribal resources in Ross from 1960-2018. I assume the Town of Ross has mentioned relevant reports and resources for which Ross has contracted separately.	3.4.3 Environmental Setting, Project Setting, Record Search
Garril Page	I will add that the FAP Riparian Corridor proposes excavation and land disturbance in areas of early tribal settlements. The Project lead agency must exercise extreme diligence in honoring artifacts uncovered in the project area.	3.4.6 Impact Discussion (see also 3.14 Tribal Cultural Resources, 3.14.4 Regulatory Setting, Regional and Local Regulations)

3.4.3 Environmental Setting

Regional Setting

Human modification of the natural landscape in Marin County has changed the composition of the plant communities, habitats, and wildlife that use them. The most prominent activities are agriculture, livestock grazing, timber operations, road building, and urban and suburban development, all of which began in the nineteenth century and, with the exception of timber operations, persist into the present day. Urban and suburban development have contributed to considerable fragmentation of the natural areas. Within the project area, specifically, Corte Madera Creek was channelized in the 1970s, particularly at the downstream end of the project footprint. Furthermore, portions of the creek channel were lined with concrete.

Prehistoric Context

Information included in this prehistoric context is largely derived from Corte Madera Creek Flood Risk Management Project Draft EIS/EIR (USACE, 2018).

While there has been less archaeological research in Marin County as compared to other portions of the San Francisco Bay Region, research conducted in nearby areas (primarily Sonoma County) is germane to the prehistoric setting of the project area. This chronology is taken primarily from Basgall, et al. (Basgall, et al., 2006, in USACE, 2010) with other reference material cited as appropriate.

The Paleo-Indian Occupation dates from approximately 10,000 to 8000 B.C. There is scant evidence of this time period in areas surrounding Marin County, and none in Marin County itself. The cultural system in place during this time period is uncertain, but it has been suggested that the economic focus was on hunting with minimal to no reliance on vegetal resources (Fredrickson, 1984, in USACE, 2010).

The Lower Archaic Period follows the Paleo-Indian Occupation, lasting from approximately 8000 to 3000 B.C. There is little evidence of human occupation in Marin County for this time period. Evidence in the form of artifacts common to this time period have been found in nearby areas, such as at Duncan's Landing and Bodega Bay. Further south of Marin County, there are indications of millingstone-dominant archaeological assemblages starting circa 4500 B.C., which implies that a more diversified subsistence pattern including various vegetal resources had replaced the earlier focus on hunting. The scarcity of sites dating to this period along bayshore margins may be attributable to rising sea levels and inundation. The earliest radiometric dates of artifacts found in Marin County fall near the end of this time period, around 3500 B.C. This date was obtained at archaeological site CA-MRN-17, located at De Silva Island.

The Early Period, the next interval in the chronology, dates from approximately 3000 to 350 B.C. Occupational intensity increased during this period, with larger numbers of archaeological components identified at a greater number of locations. During the early part of this period, there was an emphasis on gathering food resources from marshes and seed-rich grasslands. Millingstones and handstones were common during this period, indicating that a more generalized gathering subsistence pattern, which began during the Lower Archaic Period,

continued during the Early Period. Other artifacts that are associated with this time period include large, concave-base dart points, lanceolate bifaces, perforated charmstones, mortars and pestles, grooved and notched netweights, and a variety of distinctive bead and ornament types. Burials during this period tend to be in flexed position with no apparent concern for orientation. Across the region, archaeological components dating to this period tend to be artifactually diverse and temporally disjunctive, implying that there may have been multiple cultural traditions and adaptive strategies in place across the landscape. One of the better-analyzed sites in the County is CA-MRN-152, the Pacheco site, located in the northeastern portion of the County.

The Middle Period followed the Early Period and lasted from approximately 350 B.C. to A.D. 800. A proliferation of sites dating to this period implies growing populations and increased attention to new habitat types (Hylkema, 2002, in USACE, 2010). Major semi-permanent villages appeared in several marsh/lacustrine areas in the region, including San Francisco, San Pablo, and Bodega Bays and Laguna de Santa Rosa. Archaeobotanical studies indicate that the range of exploited food resources expanded even further from previous periods. This finding implies that the gathering of a variety of resources intensified to keep up with a growing population. Artifacts associated with this period include round-bottom mortars, shaped pestles, numerous crude stone sinkers, net mesh gauges, heavy projectile points, finely made stone drills, quartz crystals with pitch, and a large variety of bone artifacts such as tubes, head scratchers, needles, awls, chisels, and daggers. An increased number of mortars and pestles indicate that acorns became a very important food resource. Burials consist of primary interment, usually with high numbers of grave-associated artifacts and beds of red ochre. There are several archaeological sites with components dating to this period in Marin County along the coast of San Pablo Bay, including CA-MRN-115, CA-MRN-168, CA-MRN-254, CA-MRN-524, and CA-MRN-601. Other sites dating to this period include CA-MRN-27 (near Tiburon), CA-MRN-26, and CA-MRN-255/H.

The final interval in the cultural chronology is the Late Period, dating from A.D. 800 to 1800. This period is characterized by even greater resource intensification than earlier periods, greater sedentism, and increased social elaboration. Other changes include a population shift away from lakes and estuaries to riparian contexts in the oak woodlands. In woodland areas, populations could focus on collecting and storing acorns, which during this period became the primary subsistence resource. Hinterlands were visited more often, and hunting of terrestrial mammals became more important as the economic focus shifted away from baysides to uphill settings. An increase in social complexity is evidenced by an increased number of non-utilitarian artifacts. All these changes are generally seen as indicative of the entrance of Coast Miwok groups into the area. The early part of this period is characterized by flat-based show mortars, shaped pestles, and small triangular-bodied, serrated obsidian projectile points. Bone artifacts include hairpins, awls, and needles, though fewer than in previous periods. Cremations are introduced, but primary inhumations are also still found; burials are often accompanied by "killed" mortars. The latter part of this period occurs just before European contact. Characteristic artifacts of the latter part of the period include flanged pestles, small

serrated and non-serrated obsidian arrow points, banjo and triangular-shaped shell pendants, and tubular bird bone artifacts including pyro-incised tubes, whistles, and beads. Cremations with grave-associated artifacts became the common burial form. Near the terminal portion of this period, historic-period artifacts include spikes, porcelain trade beads, and glass. Several sites with archaeological components dating to this period have been identified along San Antonio Creek, including CA-MRN-196, CA-MRN-371, and CA-MRN-374. In addition, six sites have been documented in the Gallinas Valley, and two sites near the city of Novato, CA-MRN-502 and CA-MRN-530.

Geoarchaeological Context

As a result of the dynamic nature of California's landscape, archaeological sites deposited over the last circa (ca.) 13,500 years (roughly the time that humans are known to have lived in California) have been subject to numerous geomorphic processes that have either buried, destroyed, or left these resources intact on the surface of the ground. These geomorphic processes can include alluvial fan deposition, fluctuating river courses, and related floodplain deposition. In general, most Pleistocene Age landforms have little potential for harboring buried archaeological resources as they developed prior to human migration into North America (ca. 13,000 years before the present [B.P.]). However, Late Pleistocene surfaces buried below younger Holocene deposits do have a potential for containing archaeological deposits. Holocene alluvial deposits may contain buried soils (paleosols) that represent periods of landform stability before renewed deposition. The identification of paleosols within Holocene Age landforms is of particular interest because they represent formerly stable surfaces that have a potential for preserving archaeological deposits.

Ethnographic Context

Information included in this Ethnographic Context is largely derived from Corte Madera Creek Flood Risk Management Project Draft EIS/EIR (USACE, 2018).

The project area lies within the traditional territory of the Coast Miwok people. Miwok is a Penutian language with three groups within California: the Lake Miwok, located to the south of Clear Lake; the Eastern Miwok, located in the Sierra Nevada foothills; and the Coast Miwok, located on the North Bay and adjacent to the coast. The Coast Miwok, in turn, have been divided into two major dialect groups: the western, or Bodega, and the southern, or Marin (Kelly, 1978, in USACE, 2010). The project area lies more specifically within the territory of the Habasto group, the nearest ethnographic village of which was named *Awani-wi*, which was located near Mission San Rafael (Milliken, 1995, in USACE, 2010).

The Coast Miwok lived in an area with diverse terrain and varied food resources. Some animal foods such as deer and crab were available year-round, but in general, subsistence practices followed an annual cycle. During the spring, food resources included small fish, greens, pinole seeds, blue dick bulbs, and other marsh and bay resources. The economic focus shifted to upland areas for hunting and gathering various vegetal resources, especially seeds and buckeye, during the summer. Acorns and hazelnuts were collected in the fall and stored for the

winter. Salmon and trout were gathered during the winter runs. Other winter resources included geese, mud hens, and stored foods.

Conical grass-covered dwellings with slightly excavated central hearths were the most common type of housing. Tule or sedge mats were used to cover the floor. Each dwelling accommodated from six to ten nuclear or extended family members. During most of the year, the Coast Miwok appear to have resided in small camps close to resource gathering sites. As winter approached, they would return inland to the winter village, which was commonly located next to a stream and acorn supply (Basgall, et al., 2006, in USACE, 2010). This village usually consisted of a maximum of ten houses and contained more substantial structures, such as a large earth oven, a dance house, and one or possibly two sweathouses. Both the sweathouse and the dance house were semi-subterranean pole-and-stick structures covered in brush, grass, and earth (Kelly, 1978, in USACE, 2010).

Coast Miwok groups lived in small autonomous political entities comprised of intermarried families of some two to four hundred people (Milliken, 1995, in USACE, 2010). These groups were often led by a male headman, called a *capitán* by the Spanish. This tribal leader's role was limited, and the office was not necessarily inherited; the tribal leader acted as more of an advisor and coordinator, settling internal disputes and organizing labor for communal ceremonies and hunts. Women also held important leadership roles, organizing and overseeing numerous activities, particularly ceremonial festivals such as the Acorn Dance, *sünwele* dance, and certain aspects of the Bird Cult (Kelly, 1978, in USACE, 2010). Local groups interacted with neighboring groups through trade, feasts, seasonal ceremonial dances, and marriage. Both sexes acted as doctors.

The material culture of the Coast Miwok reflects a balance between what was locally available and what could be obtained through trade. As common to most California groups, basketry was a well-developed art among the Coast Miwok, and baskets were used for multiple functions. Twined baskets were most often used for cooking, storage, and seed processing, as burden baskets, and for other utilitarian functions. Coiled baskets, produced with the aid of bone awls, were more often used for decorative and ceremonial functions, commonly being adorned with woodpecker and duck feathers, abalone, and clamshell pendants. Other textiles included nets for fishing and rabbit skin blankets or capes. Ground stone-milling equipment was essential for processing the multitude of plant and seed resources utilized by the Coast Miwok. Obsidian, obtained through trade, was a preferred source for arrow-sized projectile points and butchering knives, while green chalcedony was preferred for general utility knives (Basgall, et al., 2006, in USACE, 2010; Kelly, 1978, in USACE, 2010). Animal bone was used to make various implements from hide scrapers, fishhooks, and needles to labrets and bird bone whistles. Olivella and abalone shell was most often used to make beads and pendants, while clamshell was used to make disk-shaped beads to be used as currency throughout Central California in later times.

The Coast Miwok were visited by Sir Francis Drake in 1579 and by Sebastian Rodriquez Cermeno in 1595. Exploration of the Petaluma River again brought Europeans into Coast

Miwok territory in 1775; however, extended encounters with European settlers did not occur until the following year, with the establishment of the Presidio of San Francisco and Mission San Francisco de Asís (Hoover, et al., 2002, in USACE, 2010). In 1817, Mission San Raphael Arcángel was established within Marin County, and the local Native Americans began to be recruited there. By the 1820s, a large percentage of Coast Miwok were associated with the missions. European-carried diseases had taken their toll on Native American populations since contact, but an outbreak of smallpox in 1837 was particularly severe for the Native Americans in Marin, Sonoma, Napa, and Solano counties. This outbreak, originating from Fort Ross, caused the death of an estimated 60,000 to 70,000 Native Americans (Basgall, et al., 2006, in USACE, 2010).

Historic Background

Information included in this Historic Context is largely derived from Corte Madera Creek Flood Risk Management Project Draft EIS/EIR (USACE, 2018). The Town of Ross is in what was once the 8,877-acre Mexican land grant Rancho Punta de Quentin Canada de San Anselmo. This grant was given to Captain Juan B. R. Cooper in 1840 and later sold to James Ross in 1857 (Town of Ross, 2007). James Ross, for whom the Town of Ross is named, was a Scotsman from Australia who made his fortune in the wholesale liquor business (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). After purchasing the lands for $50,000, he moved there with his wife, Annie Ross, and their three children. Their home was located at 111 Redwood Drive (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). Ross sold timber from his lands and established a trading post at the mouth of Corte Madera Creek named Ross Landing (now Kentfield Corners), which is located at the intersection of Sir Francis Drake Boulevard and College Avenue. From the trading post, packet schooners made runs to and from San Francisco three times a week. In 1862, James Ross died, and his wife was forced to sell a portion of the land holdings. The remaining 297 acres she retained are in the jurisdictional boundary of the Town of Ross today.

In 1863, Annie Ross, James Ross's eldest daughter named for her mother, married George Austin Worn. The following year, the couple created an estate they named Sunnyside. The first building constructed on the estate was the Octagon House, which is today home to the Jose Moya del Pino Library and the Ross Historical Society (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). The Worns were also interested in horticulture. Many of the plants they brought back from their travels around the world form the foundation of the gardens at the current Marin Art and Garden Center, which was established on the Sunnyside grounds in 1945. The magnolia tree that stands in the middle of the Center's lawn was also planted by the Worns in the 1860s.

In 1873, the North Pacific Railroad acquired a right-of-way to run a steam railroad through Ross Valley, and in 1882, Annie Ross, James Ross's widow, deeded 1.4 acres of land to the railroad with the stipulation that the station they built be named in the memory of her husband and son (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). Soon after, the first post office was opened in the area, in 1887. Now that the valley had an established route of transportation and communication, many prosperous families from San Francisco began to set up country estates

in the area. In 1908, the first Ross firehouse was erected, and the Town of Ross was incorporated.

One of the first actions of the new town was to improve transportation routes throughout the city by paving streets and erecting streetlights. One of the first ordinances passed was a provision that trees could not be cut down without prior town approval (Town of Ross, 2007). Other civic improvements included the construction of five reinforced concrete bridges. These bridges were built by John Buck Leonard, a civil engineer and pioneer of reinforced concrete bridge construction. Today, they are the only remaining cluster of Leonard's work in the State of California (Ross Property Owners' Association, 2008). The Lagunitas Road Bridge is probably the most famous example of these bridges. In 1986, all five bridges were found eligible for nomination to the National Register of Historic Places (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). Other Town of Ross landmarks from the early twentieth century include the Lagunitas Country Club, founded in 1903; the St. Anselmo Catholic Church, dedicated in 1908; St. John's Episcopal Church, constructed in 1911; Ross Grammar School, erected in 1911; and Ross Common, given to the Town of Ross in 1911 by Annie Ross Worn (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). In the 1920s, the Town of Ross voted to spend $100,000 to purchase the Shotwell estate. Upon this land the town built the present Ross Town Hall and Fire Station in 1927 (Town of Ross, 2007).

With the completion of the Golden Gate Bridge in 1937, Marin County became more accessible, and the population of the Town of Ross began to increase. However, low-density development, environmental, and historical ordinances allowed the town to preserve most of its historic, rural characteristic. Today, the Town of Ross is still primarily a residential center comprised of landscaped streets and gardens, resting under a leafy canopy, and would not have been possible without the foresight and an environmental proclivity of the Town's founding leaders (Town of Ross, 2007).

Project Setting

According to the U.S. Army Corps of Engineers (USACE) 2018 consultation letter to the State Historic Preservation Officer (SHPO), the USACE has been active along this stretch of Corte Madera Creek since the 1960s (Beech, 2018), likely since modern channelization was first implemented. The USACE conducted record searches in 1978, 1998, 2003, and 2010. A pedestrian archaeological survey of the current project area was first conducted in 1978, and a survey of the built environment resources was completed in 1979 (Beech, 2018). Because details of these earlier studies are not available, information provided herein is limited to the USACE's most recent involvement with the project, as reported in their 2018 Draft EIS/EIR and the 2018 SHPO consultation letter.

Record Search

Two record searches have recently been conducted for the project by the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University. The USACE conducted a record search in January 2017 (NWIC File No.: 16-0601), and a second record search was conducted during July 2020 (NWIC File No.: 19-2242) for the

current project. The second record search requested new information since 2017 to augment the USACE's search; it was not an entirely new search of the project area.

The USACE record search identified two previously recorded resources within the project area and eight within a 500-foot search buffer, as measured from the centerline of the creek channel. The two in the project area include a bridge and a prehistoric site that was determined to consist of redeposited material through site investigations. Four of the eight resources within the 500-foot search buffer were Native American sites, and four were built environment resources. The 2020 record search did not identify any additional previously recorded resources within the project footprint, but one built environment resource had been recorded within the 500-foot search buffer. Resources identified by the record searches are listed in Table 3.4-2.

Table 3.4-2 NWIC Records Search Results – Resources

Resource Primary Number/Trinomial	Resource Name or Description	In Project APE/Buffer
USACE January 2017 Record Search (NWIC File No.: 16-0601)		
P-21-0101/CA-MRN-71	Prehistoric midden site	Buffer
P-21-0102/CA-MRN-72	Prehistoric midden site	Buffer
P-21-0294/CA-MRN-311	Prehistoric midden site	Buffer
P-21-0544/CA-MRN-406	Prehistoric midden site	Buffer
P-21-1327	Lagunitas Road Bridge over San Anselmo Creek*	APE
P-21-1329	Shady Lane Bridge over Ross Creek	Buffer
P-21-1330	Sir Francis Drake Boulevard Bridge over San Anselmo Creek	Buffer
P-21-1331	Winship Bridge over Corte Madera Creek	Buffer
P-21-2635	Ross Town Hall, Ross Fire House, and Ross Public Works building	Buffer
P-21-2794	Redeposited prehistoric midden material	APE
Horizon July 2020 Record Search (NWIC File No.: 19-2242)		
P-21-2918	Kentfield Fire Protection District Station No. 17	Buffer

[a] Although the record for the bridge identifies the creek crossing as San Anselmo Creek, the NWIC map clearly shows it as crossing Corte Madera Creek.

Sources: (NWIC, 2017; NWIC, 2020)

The USACE record search identified nine cultural resources studies within the USACE project area of potential effects, which aligned closely with the current project area. These included archaeological and architectural reports on earlier studies by the USACE of their Unit 4 project and other archaeological studies clustered around the College of Marin. Another 15 studies had

been conducted within the 500-foot record-search buffer. By July 2020, one additional archaeological study had been conducted within the project footprint. The search also identified four additional studies in the 500-foot search buffer and three regional overviews that include the project area. Studies conducted within the project area are listed in Table 3.4-3.

Table 3.4-3 NWIC Records Search Results – Studies in the APE

Report Number	Author (Date)	Report Title
USACE January 2017 Record Search (NWIC File No.: 16-0601)		
S-001025	T. L. Jackson (1976)	Archaeological Testing Program at the site of the proposed planetarium on the College of Marin Campus (letter report)
S-001184	E. Kandler (1978)	Cultural Resource Reconnaissance of the Corte Madera Creek Unit 4 Flood Control Project, Township of Ross, Marin County, California
S-006424	C. Desgrandchamp and D. Chavez (1984)	Archaeological Resources Evaluation for the Central Marin Sanitation Wastewater Transportation Facilities Improvement Project – Phase II, Marin County, California (EPA Project No. C-06-2467-21)
S-012944	R. Cartier, B. Bocek, and J. Whitlow (1979)	Archeological Testing Program of Corte Madera Creek Flood Control Project – Unit 4
S-015982	B. Goerke, et al. (1994)	Uncovering the Past at College of Marin
S-016949	W. Roop (1991)	A Cultural Resources Evaluation of a Proposed Reclaimed Water Pipeline in the San Quentin Point, Corte Madera, Larkspur, Kentfield and San Rafael Areas
S-036271	URS (2008)	Historic Property Survey Report, Lagunitas Road Bridge (27C-71) at Corte Madera Creek Replacement Project, BRLS 5176(003), Town of Ross, California
S-036937	B. Brewster (2010)	Archival Documentation Report, Dickson Hall – College of Marin
S-047475	L. D. Stables, III (1979)	Historical/Architectural Assessment of Buildings and Grounds Along Corte Madera Creek in Ross, California
Horizon July 2020 Record Search (NWIC File No.: 19-2242)		
S-050061	Archeo-Tec, Inc. (2017)	Phase I Cultural Resources Evaluation for the Ross Valley Sanitary District Large Diameter Gravity Sewer Rehabilitation Project II-3, Marin County, California

Sources: (NWIC, 2017; NWIC, 2020)

Archaeological Survey

According to the USACE 2018 Draft EIS/EIR (USACE 2018:4.7-9):

> A pedestrian survey was conducted of the study area on 5 and 6 April 2010[1] along both the east and west banks of Corte Madera Creek. For areas of possible ground disturbance, the inspection generally extended from either creek bank for 30 meters; however, heavy residential development, in some areas of the study area required a decreased inspection area. Vegetation cover was dense in most areas, with vines and grasses severely limiting ground visibility; in other areas, imported gravels on a bike path also limited ground visibility. Prehistoric artifacts, features, or middens were not observed during the pedestrian survey. Shell fragments were observed near the fence line adjacent to the College of Marin near site CA-MRN-406…

Horizon confirmed the area of survey coverage in a conversation on August 21, 2020, with Kathleen Ungvarsky, the USACE archaeologist who conducted the survey (Ungvarsky, 2020). Ms. Ungvarsky noted that the only areas that were inaccessible within the project footprint were two private properties just downstream of the Lagunitas RoadBridge, on the left side of Corte Madera Creek.

An archaeological survey was conducted of the current project area on July 28, 2020, by a qualified Horizon archaeologist who meets the U.S. Secretary of Interior's professional standards (Horizon Water and Environment, 2020). Because the entirety of the project area had previously been surveyed by the USACE (Beech, 2018; USACE, 2018) for the previous project, the present survey focused on the proposed locations of staging areas and the creekbanks in the backyards of 21, 23, 25, 27, and 29 Sir Francis Drake Boulevard, where widening of the channel and/or channel bank stabilization activities are proposed. The proposed location of the stormwater pump station and channel access ramp, as well as portions of the project near previously recorded archaeological sites, were also inspected. Most of the surveyed areas were limited in size, and informal transects were spaced between 10 and 30 feet apart. Ground-surface visibility was partially restricted in many places due to vegetation, and most of the staging areas were in paved parking lots. Representative photographs were taken of the project area as well as the houses at 21, 23, 25, 27, and 29 Sir Francis Drake Boulevard. No archaeological resources were identified by the field survey.

Geoarchaeology

No intact archaeological sites were identified in the archaeological inventory of the project area during earlier studies by the USACE (USACE, 2018) or more recently for the present project (Horizon Water and Environment, 2020); however, archaeological sites may be buried, with no

[1] A letter to the SHPO from K. Ungvarsky (2018) says that a survey was conducted in March 2015. Efforts to clarify this discrepancy with the USACE were unsuccessful.

surface manifestation. A review of geologic reconstructions of the subsurface geologic layers underlying the project area indicates that most of the area is underlain by Holocene Age soils that have the potential to contain buried archaeological remains (Witter, et al., 2006; Meyer & Rosenthal, 2007). However, sea levels rose dramatically during the Middle Holocene (ca. 7,000 to 4,000 B.P.), deeply burying any existing archaeological deposits from that time along the margins of the San Francisco Bay and upstream channels that flowed into the bay. This activity is applicable to the southwest extent of the APE, which was historically under bay waters (pre--1800s). However, more recently, landscape changes brought about by early Spanish settlement, as well as changes in upstream channel vegetation brought about by cattle raising and other activities, made many of these channels, such as Corte Madera Creek, much more susceptible to erosion. As a result, many of the lower terraces along the margins of the bay tend to contain historic-period sediments (Meyer & Rosenthal, 2007) that could have eroded and/or covered archaeological deposits. Moreover, rapid urban development along stream channels and areas along the bay margins have had further deleterious effects on buried deposits with the introduction of artificial fill and concrete channelization. These factors suggest that areas of the project area that fall within the former limits of the bay are not considered sensitive for buried archaeological deposits.

In addition, despite the higher potential to encounter Holocene Age deposits in the areas of the project area east of the former limits of the bay, the considerable channelization and alteration of the existing stream channel over the last 50 years—which includes massive concrete channels and stabilizing infrastructure along the banks of the creek—would indicate that any buried deposits within this corridor would likely have been destroyed. Further, the high-energy flood events along this corridor would also diminish the probability of intact deposits, particularly along the narrow band of the channel itself, which, in turn, would not have been a location favorable for long-term prehistoric settlement. Because the proposed actions are taking place within the footprint of the existing infrastructure or previously disturbed areas, the probability of encountering buried deposits in these areas is considered low.

Native American Consultation

An email request was made to the Native American Heritage Commission (NAHC) on June 15, 2020, to review its files for the presence of recorded sacred sites on the project area. The NAHC responded on June 16, 2020, stating that the records search did not identify significant resources in the project vicinity.

Marin County Department of Public Works sent project notification letters to the Federated Indians of Graton Rancheria (FIGR) and the Ione Band of Miwok Indians for the purpose of consultation as required by PRC Section 21080.3.1 (also known as Assembly Bill 52). The letters were sent via U.S. Certified Mail, with a return receipt sent on June 23, 2020. Follow-up emails were sent on August 5, 2020. FIGR requested formal consultation on the project in an emailed letter dated August 6, 2020. Requested record search information was provided to the tribe on August 21, 2020. Tribal consultation is discussed in Section 3.14 Tribal Cultural Resources.

Architectural Survey and Evaluation

The USACE Draft EIS/EIR identified five built environment resources adjacent to the project APE, as listed in Table 3.4-4, and described below. All the resource descriptions are taken directly from the USACE 2018 EIS/EIR.

Table 3.4-4 Built Environment Resources Identified by the USACE

Resource Primary Number	Resource Name or Description	Date of Construction	NRHP/CRHR Eligibility
P-21-1327	Lagunitas Road Bridge over San Anselmo Creek [a]	1909; reconstructed 2010	Eligible by consensus
P-21-1329	Shady Lane Bridge over Ross Creek	1909	Eligible by consensus
P-21-1330	Sir Francis Drake Boulevard Bridge over San Anselmo Creek	1909	Eligible by consensus
P-21-1331	Winship Bridge over Corte Madera Creek	1912	Not evaluated
P-21-2635	Ross Town Hall, Ross Fire House, and Ross Public Works building	1927	Eligible

Notes:

[a] Although the record for the bridge identifies the creek crossing as San Anselmo Creek, the NWIC map clearly shows it as crossing Corte Madera Creek.

[b] CRHR = California Register of Historical Resources

[c] NRHP = National Register of Historic Places.

Source: (USACE, 2018)

P-21-1327 is the Lagunitas Road Bridge, one of the first concrete bridges designed strictly on the cantilever principal, making possible a shallow depth in the carry girders. The bridge is carried by five haunched, continuous reinforced concrete T-beams on solid wall piers and end-diaphragm abutments. It has three spans, with a total length of 77.5 feet and width of 27.8 feet. It was one of five bridges built by the Town of Ross in 1909 and designed by John B. Leonard and is within the project area. The Lagunitas Road Bridge was reconstructed in 2010 and would not be altered by the project.

P-21-1329 is the Shady Lane Bridge over Ross Creek. It has a deck arch construction with a timber sidewalk added to the left side of the deck. The three spans create a 42.8-foot-long by 20-foot-wide roadway. This was the third of the five bridges built by the Town of Ross in 1909 and designed by John B. Leonard; this bridge is outside, but adjacent to, the project area.

P-21-1330 is the Sir Francis Drake Boulevard Bridge over San Anselmo Creek. It is a reinforced concrete deck arch span with a total length of 63 feet, with Toddlike rails of concrete. This was the second of the five bridges built by the Town of Ross in 1909 and designed by John B. Leonard. The site crosses Corte Madera Creek approximately 700 feet northwest of the project improvements, outside of the project area.

P-21-1331 is the Winship Bridge and carries Winship Road over Corte Madera Creek. It is an earth-filled, reinforced concrete bridge, 91 feet long, composed of two arches with spans of 40 feet and 28 feet. Rails are reinforced concrete planters. Four metal light standards at the corners are embossed with the Westinghouse logo. This was built after the five Leonard bridges in Ross. The Winship tract was a development being represented, in 1912, by Chadwick & Sykes, Contracting Engineers. At that time, they were trying to get the Town of Ross to accept their roadways as "public highways." The Winship Bridge no doubt dates from this general period. The site crosses Corte Madera Creek more than 1,000 feet north of proposed project improvements, outside of the project area.

P-21-2635 is the site of the Ross Town Hall, Ross Fire House, and Ross Public Works building. The Town Hall and Fire House were built in 1927 and designed by John White, one of the Bay Area's preeminent architects, after the city appropriated funds for the land. The Town Hall and Fire House were designed in the Spanish/Mission Revival style, with smooth stucco-faced exterior walls and appropriate design elements. The Town Hall and Fire House appear eligible for listing on the National Register of Historic Places (NRHP) under Criteria A and C for their association with city planning and municipal government and for their architecture. The Ross Town Hall and Firehouse are located near the northern end of the project area but are situated just outside of it, to the west.

In addition to the buildings evaluated by the USACE, five houses at 21, 23, 25, 27, and 29 Sir Francis Drake Boulevard were evaluated for NRHP/CRHR eligibility by a qualified architectural historian/historian (Horizon Water and Environment, 2020) The lots containing the homes are directly adjacent the transition element in Unit 4 of the project. As a result, the properties could be impacted by widening of the channel and/or channel bank stabilization actions. The five properties are listed in Table 3.4-5. None of these built environment resources appear to be eligible for listing in the NRHP/CRHR.

Table 3.4-5 Built Environment Resources Evaluated for the Current Project

Building Address	Date of Construction	NRHP/CRHR Eligibility
21 Sir Francis Drake Boulevard	c1951	Not eligible
23 Sir Francis Drake Boulevard	c1948	Not eligible
25 Sir Francis Drake Boulevard	c1951	Not eligible
27 Sir Francis Drake Boulevard	c1948	Not eligible
29 Sir Francis Drake Boulevard	c1948	Not eligible

Notes: CRHR = California Register of Historical Resources; NRHP = National Register of Historic Places

Source: (Horizon Water and Environment, 2020)

3.4.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

National Historic Preservation Act of 1966 (as amended)

Effects of federal undertakings on historical and archaeological resources are considered through the National Historic Preservation Act (NHPA) of 1966, as amended (54 United States Code 306108), and its implementing regulations. Before an undertaking (e.g., federal funding or issuance of a federal permit) is implemented, Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties (i.e., properties listed in or eligible for listing in the National Register) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the National Register. Under the NHPA, a property is considered significant if it meets the National Register listing criteria A through D, at 36 Code of Federal Regulations 60.4, as follows:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:
>
> a. Are associated with events that have made a significant contribution to the broad patterns of our history, or
> b. Are associated with the lives of persons significant in our past, or
> c. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
> d. Have yielded, or may be likely to yield, information important in prehistory or history.

For a resource to be eligible for the National Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. Resources that are less than 50 years old are generally not considered eligible for the National Register.

Federal review of the effects of undertakings on significant cultural resources is carried out under Section 106 of the NHPA and is often referred to as the Section 106 review. This process is the responsibility of the federal lead agency. The Section 106 review typically involves a four-step procedure, which is described in detail in the implementing regulations of the NHPA:

1. Define the Area of Potential Effects in which an undertaking could directly or indirectly affect historic properties.
2. Identify historic properties in consultation with the State Historic Preservation Officer (SHPO) and interested parties.

3. Assess the significance of effects of the undertaking on historic properties.
4. Consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the Advisory Council on Historic Preservation and proceed with the project according to the conditions of the agreement.

State Regulations

The State of California consults on implementation of the NHPA of 1966, as amended, and also oversees statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation, as an office of the California Department of Parks and Recreation, implements the policies of the NHPA statewide. The Office of Historic Preservation also maintains the California Historical Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions.

California Environmental Quality Act

The California Environmental Quality Act, as codified in PRC Section 21000 *et seq.*, is the principal statute governing the environmental review of projects in the state. CEQA requires lead agencies to determine if a project would have a significant effect on historical resources, including archaeological resources. The State CEQA Guidelines define a historical resource as: (1) a resource in the California Register; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

CEQA requires lead agencies to determine if a project would have a significant effect on important archaeological resources, either historical resources or unique archaeological resources. If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 would apply, and State CEQA Guidelines Sections 15064.5(c) and 15126.4 and the limits in PRC Section 21083.2 would not apply. If a lead agency determines that an archaeological site is an historical resource, the provisions of PRC Section 21084.1 and State CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the State CEQA Guidelines criteria for a historical resource, then the site may meet the threshold of PRC Section 21083.2 regarding unique archaeological resources. A unique archaeological resource is:

> an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> 1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person" (PRC Section 21083.2 [g]).

The State CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064.5[c][4]).

Assembly Bill 52

In September 2014, the California Legislature passed AB 52, which added provisions to the PRC regarding the evaluation of impacts on tribal cultural resources under CEQA and consultation requirements with California Native American tribes. In particular, AB 52 now requires lead agencies to analyze project impacts on tribal cultural resources separately from archaeological resources (PRC Sections 21074, 21083.09). The Bill defines tribal cultural resources in a new section of the PRC (Section 21074). AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC Section 21080.3.1, 21080.3.2, 21082.3).

Specially, PRC Section 21084.3 states:

> a) Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.
>
> b) If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process provided in Section 21080.3.2, the following are examples of mitigation measures that, if feasible, may be considered to avoid or minimize the significant adverse impacts:
>
> > 1) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
> >
> > 2) Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
> >
> > > A. Protecting the cultural character and integrity of the resource.
> > >
> > > B. Protecting the traditional use of the resource.
> > >
> > > C. Protecting the confidentiality of the resource.

3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

4) Protecting the resource.

In addition, the Office of Planning and Research updated Appendix G of the State CEQA Guidelines to provide sample questions regarding impacts on tribal cultural resources (PRC Section 21083.09).

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility are based on National Register criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for or listed in the National Register.

To be eligible for the California Register, an historical resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history (PRC Section 5024.1[c]).

For a resource to be eligible for the California Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register.

California Public Resources Code and Health Safety Code

Several sections of the PRC protect cultural resources. Under PRC Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by human agency, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor. Section 5097.98 states that if Native American remains are identified within a project area, the lead agency must work with the appropriate Native Americans as identified by

the NAHC and develop a plan for the treatment or disposition of, with appropriate dignity, the human remains, and any items associated with Native American burials. These procedures are also addressed in Section 15064.5 of the State CEQA Guidelines. California Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur as a result of development on public lands.

Title 14, Sections 4307 and 4308, of the California Code of Regulations also prohibit any person from removing, inuring, defacing, or destroying any object of paleontological, archaeological, or historical interest or value.

Regional and Local Regulations

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan (Marin County, 2007, as amended) are relevant to the project (Marin County , 2007).

> ***HAR-1.1: Preserve Historical and Archaeological Resources.*** Identify archaeological and historical resource sites.
>
> ***HAR-1.2: Document Historical Information.*** Provide documents, photographs, and other historical information whenever possible to be catalogued in the Anne T. Kent California Room in the Marin County Free Library.
>
> ***HAR-1.3: Avoid Impacts to Historical and Archaeological Resources.*** Ensure that human activity avoids damaging cultural resources, where feasible.

Implementing programs associated with these policies ensures that significant cultural resources will be identified and protected, when feasible, and that Native American tribes will be consulted, when applicable.

Marin County Development Code

Marin County has the following code to ensure that the construction of new development and the establishment of new and modified uses contribute to the maintenance of a stable and healthy environment, that new development is harmonious in character with existing and future development, and that the use and enjoyment of neighboring properties are protected, as established in the Countywide Plan.

> ***22.20.040: Archaeological and Historic Resources***. In the event that archaeological or historic resources are discovered during any construction, construction activities shall cease, and the Agency shall be notified so that the extent and location of discovered materials may be recorded by a qualified archaeologist, and disposition of artifacts may occur in compliance with State and Federal law. The disturbance of an Indian midden may require the issuance of an Excavation Permit by the Department of Public Works, in compliance with Chapter 5.32 (Excavating Indian Middens) of the County Code.

Town of Ross General Plan

The following policies of the Ross General Plan related to cultural resources are applicable to the project (Town of Ross, 2007).

Goal 1. An Abundance of Green and Healthy Natural Systems

> **1.1 Protection of Environmental Resources**. Protect environmental resources, such as hillsides, ridgelines, creeks, drainage ways, trees and tree groves, threatened and endangered species habitat, riparian vegetation, cultural places, and other resources. These resources are unique in the planning area because of their scarcity, scientific value, aesthetic quality and cultural significance.

Goal 4. Protecting Historic Places and Resources

> **4.1 Historic Heritage**. Maintain the historic feel of Ross by preserving and maintaining historic buildings, resources and areas with recognized historic or aesthetic value that serve as significant reminders of the past.
>
> **4.5 Archaeological Resources**. Implement measures to preserve and protect archaeological resources. Whenever possible, identify archaeological resources and potential impacts on such resources. Provide information and direction to property owners in order to make them aware of these resources. Require archaeological surveys, conducted by an archaeologist who appears on the Northwest Information Center's list of archaeologists qualified to do historic preservation fieldwork in Marin County, in areas of documented archaeological sensitivity. Develop design review standards for projects that may potentially impact cultural resources.

3.4.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5;
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5; and
c. Disturb any human remains, including those interred outside of formal cemeteries.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to changes in cultural resources or other cultural resource impacts in the project area. This section includes an analysis of potential short-term (construction) impacts of the project and permanent long-term (operation and maintenance impacts). Impact evaluations are assessed based on the

existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.4.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.4-1: The project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.	**Construction: No Impact**
	Operation and Maintenance: No Impact

Construction

Background research has identified five built environment resources close to the project area as historical resources pursuant to PRC Section 15064.5; that is, they are eligible for listing in the CRHR. Background research and field studies identified four additional buildings within the project area, which were evaluated but do not appear to qualify as historical resources pursuant to PRC Section 15064.5. Because the known historical resources are outside of the project area, they would not be affected by the project. No archaeological resources that are historical resources are known to exist within the APE. The project would have no impact on any known historical resources pursuant to Section 15064.5.

Operation and Maintenance

Operations and maintenance of the proposed project would be similar to operation and maintenance of the existing flood control channel. No ground disturbance would be required in operation and maintenance other than sediment removal from the fish pools and erosion control. Operation and maintenance of the project would have no impact on historical resources because no historic resources pursuant to Section 15064.5 are located in proximity to the project and operation and maintenance project will not involve any ground disturbance.

Mitigation: None required.

	Significance Determination
Impact 3.4-2: The project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: No Impact

Construction

Based on the results of the background research and pedestrian survey, there are no intact archaeological resources in the project area. Despite the effort to identify archaeological resources, the inadvertent discovery of unknown archaeological resources during construction from ground-disturbing activities including excavation is possible. in the event that archaeological resources are uncovered during project-related ground disturbing activities within the unincorporated County area of the project, compliance with Marin Development Code Section 22.20.040 (D) (outlined above in Section 4.6.2.3 Local Regulations) is required.

Under Marin Development Code Section 22.20.040 (D), if archaeological materials are discovered during construction, construction activities shall cease, and the remains shall be recorded by a qualified archaeologist and treated according to state law. While the Marin Development Code provides some protection for archaeological resources within the unincorporated County area of the project, the code does not specify the distance at which work shall halt, and without proper investigation of the resource by an archaeologist and/or appropriate Native Americans, if appropriate, the resource could be damaged due to work in the vicinity of the find. The damage to a resource prior to proper investigation or improper handling of the resource would be a significant impact. In addition, portions of the project area below Stadium Way, where the project proposes floodplain expansion and partial concrete channel wall removal, are under the jurisdiction of the California State Lands Commission. As a result, treatment of discovered archaeological sites during construction would not be covered by Marin Development Code Section 22.20.040 (D), and impacts to archaeological resources within this portion of the project area would be significant.

The Town of Ross municipal code does not address the inadvertent discovery of archaeological resources during construction. Therefore, impacts to archaeological resources that are historical resources within portions of the project area under the Town's jurisdiction would be significant.

The District would implement **Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources** to avoid significant impacts on archaeological resources encountered during construction activities. Mitigation Measure 3.4-2 requires that work is halted within 50 feet of a find and that finds are protected until examined by a qualified archaeologist. The measure also defines requirements for contacting a Native American representative, and specific requirements for any discoveries of archaeological resources within the California State Lands Commission jurisdiction. By following the procedures in Mitigation Measure 3.4-2, the District would avoid substantial adverse changes in the significance of an archaeological resource and the impact on archaeological resources would be less than significant with mitigation.

Operation and Maintenance

Operations and maintenance of the proposed project would be similar to operation and maintenance of the existing flood control channel. Operation and maintenance does not involve excavation or ground disturbing activities that could encounter significant archaeological resources; therefore, operation and maintenance of the project would not have impacts to archaeological resources.

> **Mitigation:** Implement Mitigation Measure 3.4-2.
>
> **Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources.**
>
> If evidence of any subsurface archaeological features or deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find, and the finds shall be protected until they are examined by a qualified archaeologist. Prehistoric archaeological materials

might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone-milling equipment (e.g., mortars, pestles, handstones, milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls and deposits of metal, glass, and/or ceramic refuse. The District shall retain a qualified archaeologist who meets the U.S. Secretary of the Interiors professional qualifications in archaeology to assess the significance of the find and make recommendations for further evaluation and treatment as necessary. A Native American representative from a traditionally and culturally affiliated tribe will be notified and invited to assess the find if the artifacts are of Native American ancestry and determined to be more than an isolated find. If the discovery is in an area below Stadium Way and on lands under the jurisdiction of California State Lands Commission, that agency shall be notified. Any treatments and disposition of any artifacts uncovered under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission before the treatment is implemented.
If, after evaluation, a resource is considered a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in PRC Section 21074), all preservation options shall be considered as required by CEQA (see CEQA Guidelines Section 15126.4 and PRC 21084.3), including possible capping, data recovery, mapping, or avoidance of the resource. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil. Work in the area may resume, at the direction of the District, upon completion of treatment. An Unanticipated Discoveries Evaluation and Treatment Plan shall be prepared before construction that details the procedures for dealing with unanticipated discoveries, including procedures that would be implemented for such discoveries that cannot be protected in place. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.

Significance after Mitigation: Mitigation Measure 3.4-2 specifies procedures to avoid adverse effects to archaeological resources by stopping work when archaeological materials are discovered, evaluating the significance of the find, and developing appropriate treatment to protect the site or mitigate impacts. By applying Section 15126.4 of the CEQA Guidelines and/or PRC 21084.3, avoidance and preservation in place would be the preferred option, followed by other measures such as capping and, lastly, data recovery, thus assuring that all options for minimizing impacts to the archaeological resource are considered and carried out. As a result, the impact on archaeological resources would be less than significant with mitigation.

	Significance Determination
Impact 3.4-3: The project could disturb any human remains, including those interred outside of formal cemeteries.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

Both prehistoric and historic archaeological resources may contain human burials. Based on the background research, surface survey, and subsurface survey conducted during earlier studies by the USACE, there is no indication that the project area has been used for human burial purposes. The project includes excavation into undisturbed soils and could encounter human remains, including those interred outside of formal cemeteries. Compliance with Marin Development Code Section 22.20.040 (D), PRC Section 5097.98, and Health and Safety Code Section 7050.5 (outlined above in Section 4.6.2.3 Local Regulations) would require that work be stopped in the vicinity of any discovered human remains and that the County coroner be notified of the finds. The coroner would determine the nature of the remains and contact the NAHC if the remains are of Native American ancestry. In turn, the NAHC would contact the most likely descendent of remains, who would assess the finds and work with the County to determine final treatment and disposition of the remains. PRC Section 5097.98 and Health and Safety Code Section 7050.5 are also applicable to any discovery of human remains on property under the jurisdiction of the Town of Ross or the California State Lands Commission; therefore, the same protocols would be followed. Compliance with State and County requirements to address any discovery of human burials during construction would avoid disturbance of any human remains. The impact on human remains would be less than significant.

Operation and Maintenance

Operations and maintenance of the project would not require excavation into any undisturbed soils that could expose human remains. No impact would occur.

Mitigation: None required.

3.4.7 References

Basgall, et al., 2006. (in USACE, 2010). Corte Madera Creek Flood Control Study Baseline Report.

Beech, T. E. (2018, September 24). Letter to Ms. Julianne Polanco, State Historic Preservation Officer, regarding continued consultation pursuant to Section 106of the National Historic Preservation Act for the 2018 Carte Madera Creek Flood Risk Management Environmental Impact Statement.

Fredrickson, 1984. (in USACE, 2010). Corte Madera Creek Flood Control Study Baseline Report.

Hoover, et al., 2002. (in USACE, 2010). Corte Madera Creek Flood Control Study Baseline Report .

Horizon Water and Environment. (2020). Cultural Resources Assessment for the Corte Madera Creek Flood Risk Management Project, Phase 1.

Hylkema, 2002. (in USACE, 2010). Corte Madera Creek Flood Control Study Baseline Report .

Jose Moya de Pino Library, et al., 2009. (in USACE, 2010). Corte Madera Creek Flood Control Study .

Kelly, 1978. (in USACE, 2010). Corte Madera Creek Flood Control Study Baseline Report.

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County. (1994). *Environmental Impact Review Guidelines.*

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA).*

Meyer, J., & Rosenthal, a. J. (2007). Geoarchaeological Overview of the Nine Bay Area Counties in Caltrans District 4. Far Western Anthropological Research Group Prepared for the California Department of Transportation, District 4, Oakland, CA.

Milliken, 1995. (in USACE, 2010). Corte Madera Creek Flood Control Study Baseline Report.

NWIC. (2017). Record search results (NWIC File No.:16-0601) for the Corte Madera Flood Control and Environmental Restoration Project.

NWIC. (2020). Record search results (NWIC File No.:19-2242) for the Corte Madera Flood Risk Management Project.

Ross Property Owners' Association. (2008, Early Fall). Ross Property Owners' Association Newsletter.

Town of Ross. (2007, June). Town of Ross General Plan.

Ungvarsky, K. (2020, August 19). Janis Offermann, Horizon Water and Environment, telephone communication with Kathleen Ungvarsky, U.S. Army Corps of Engineers, about previous USACE cultural resources studies within the Corte Madera Flood Risk Management Project footprint. . (J. Offermann, Interviewer)

USACE. (2018, October). Corte Madera Creek Flood Risk Management Project Environmental Impact Statement/Environmental Impact Report.

Witter, R., Knudsen, K., Sowers, J., Wentworth, C., Koehler, R., Randolph, C. E., . . . and, G. K. (2006). Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California. USGS.

3.5 Energy

3.5.1 Introduction

This section evaluates the potential impacts of the project on energy. This section also provides an overview of the environmental and regulatory settings that apply to energy and presents and discusses the potential project impacts to energy use and appropriate mitigation measures, as necessary.

3.5.2 Environmental Setting

Energy Supply

California's major sources of energy are petroleum products (i.e., gasoline, diesel, and oil), electricity, and natural gas. The California Energy Commission (CEC) indicates that California crude resources in 2019 came from in-state (29.7 percent), Alaska (11.9 percent), and foreign sources (58.4 percent) (CEC, 2020a). In 2018, California's in-state energy generation plus net imports totaled 285,675 gigawatt hours. Energy generation by source included hydroelectric (nine percent), nuclear (six percent), natural gas (32 percent), and renewable (17 percent) as well as coal and other imports (19 percent) (CEC, 2020b).

Energy Consumption

Existing land uses in the project vicinity consist of the Corte Madera Creek bed, trail and bike paths, public parks and open space, residential uses, and schools and colleges. No existing energy-emitting sources currently occur on the project site.

3.5.3 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

National Energy Conservation Policy Act

The National Energy Conservation Policy Act serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1978, it has been regularly updated and amended by subsequent laws and regulations. This act is the foundation of most federal energy requirements.

National Energy Policy Act of 2005

The National Energy Policy Act of 2005 sets equipment energy efficiency standards and seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, including hybrid vehicles; constructing energy-efficient buildings; and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed in 2007, strengthens the key energy management goals for the federal government and sets more challenging goals than the Energy Policy Act of 2005. The energy reduction and environmental performance requirements of Executive Order 13423 were expanded upon in Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance), signed in 2009.

State Regulations

Low Carbon Fuel Standard Program

The Low Carbon Fuel Standard (LCFS) program was adopted by CARB in 2009 and began implementation on January 1, 2011. In 2018, CARB approved amendments to the regulation, which included strengthening and smoothing the carbon intensity benchmarks through 2030 in line with California's 2030 greenhouse gas (GHG) emission-reduction target enacted through SB 32, adding new crediting opportunities to promote zero-emission vehicle (ZEV) adoption, alternative jet fuel, carbon capture and sequestration, and advanced technologies to achieve deep decarbonization in the transportation sector. The LCFS is designed to encourage the use of cleaner low-carbon transportation fuels in California, encourage the production of those fuels, and, therefore, reduce GHG emissions and decrease petroleum dependence in the transportation sector (CARB, 2020).

Advanced Clean Cars Program

CARB adopted the Advanced Clean Cars (ACC) program in 2012. The ACC program coordinated regulations that apply to vehicle model years 2015 through 2025 to control smog, soot-causing pollutants, and GHG emissions. The three elements of the program are the ZEV regulations, GHG regulations, and particulate-matter standard. The ZEV program became a stand-alone regulation in 1999. Since then, the ZEV program has been reviewed and continually amended as technology and emission reduction needs have been identified. The current ZEV regulations require manufacturers to produce increasing numbers of fully electric vehicles and plug-in hybrid electric vehicles for model years 2018 through 2025. GHG regulations include furthering the Low-Emission Vehicle (LEV) Program. Some elements of the most recent LEV Program amendments include reducing emissions from light- and medium-duty on-road vehicles, an increase in useful life durability of these vehicles, and more stringent particulate-matter standards. Monitoring of the effectiveness of these programs to achieve the fuel--efficiency and emission goals will continue (CARB, 2020).

Regional and Local Regulations

Marin Countywide Plan

The following goals in the Marin Countywide Plan are relevant to the project (Marin County, 2007):

Energy Efficiency

Goal EN-1.1: Adopt Energy Efficiency Standards. Integrate energy efficiency and conservation requirements that exceed State standards into the development review and building permit process.

Goal EN-1.4: Reduce Energy Use in County Facilities. Continue to integrate energy efficiency and conservation into all County functions.

Goal EN-2.2: Adopt Renewable Energy Building Standards. Integrate technically and financially feasible renewable energy requirements into development and building standards.

Goal EN-3.1: Initiate Green Building Initiatives. Encourage and over time increasingly require sustainable-resource use and construction with non-toxic materials.

Goal EN-3.3: Incorporate Green Building in County Facilities. Integrate green building practices into all County facilities.

Town of Ross Municipal Code

The following code of the Town of Ross Municipal Code related to energy is applicable to the project (Town of Ross, 2020):

Chapter 15.10 California Energy Code

> **15.10.010 Adoption of the California Energy Code by reference.** The 2019 California Energy Code (California Code of Regulations, Title 24, Part 6), with Appendix 1-A, as published by the International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, D.C. 20001 and the California Building Standards Commission, 2525 Natomas Park Drive, Suite 130, Sacramento, California 95833-2936, is adopted by reference hereto. A copy of this document is maintained in the office of the Building Department. (Ord. 700 (part), 2019; Ord. 675 (part), 2016; Ord. 650 (part), 2013; Ord. 647 (part), 2013).

Town of Ross General Plan

The following policy of the Town of Ross General Plan related to energy is applicable to the project (Town of Ross, 2007):

Goal 2. Sustainable Building and Community Practices

> ***2.2 Incorporation of Resource Conservation Measures***. To the extent consistent with other design considerations, public and private projects should be designed to be efficient and innovative in their use of materials, site construction, and water irrigation standards for new landscaping to minimize resource consumption, including energy and water.

3.5.4 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines the project would have a significant impact on energy if it would:

a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to energy resources in the project area. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.5.5 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.5-1: The project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

Implementation of the project would require the use of energy resources for construction of the project. Construction activities would be temporary and occur over a time period of seven months or less, during which time equipment and vehicles would be operating to construct the project. Energy use would primarily be in the form of petroleum products (i.e., gasoline and diesel) used to operate construction equipment and transport materials/supplies and workers to and from the project area. The precise amount of fuel required for project construction is uncertain; however, it is expected that gasoline and diesel for construction equipment and worker and haul vehicles would be comparable to quantities used for similar construction projects of similar size and magnitude, and that this consumption would not have a measurable effect on demand for local and regional energy sources. Fuel use for construction workers' commute trips would be minor in comparison to the fuel used by construction equipment and for hauling. Fuel consumption would be temporary and limited to the construction phase of the project. Construction would not require a large amount of energy, oil, or natural gas use due to

the short duration of construction and limited amount of equipment and associated fuel required. Indirect energy use would also occur and include the extraction, production, and transportation of goods and materials needed for construction. Section 2485 of the California Code of Regulations limits idling of heavy trucks traveling to and from the project area delivering and off-hauling materials, thereby limiting potential wasteful use of fuel during idling. Therefore, fuel used during construction would be conserved to the maximum extent feasible.

The demolition debris, including excavated soil and concrete, is anticipated to be recycled at the Marin Resource Recovery Center. In addition, rip-rap and excavated soil would be reused on site where feasible. Inefficient consumption of resources would be avoided through reuse of materials; therefore, project construction would have a less-than-significant impact on wasteful, inefficient, or unnecessary consumption of energy resources.

Operation and Maintenance

Implementation of the project would require the use of minimal energy resources for ongoing operation and maintenance activities, including vegetation management, sediment and debris removal, floodwall maintenance, and annual inspections. Energy use for annual inspections and maintenance activities for vegetation management, sediment removal, and floodwall maintenance would be similar to energy use for District inspection and maintenance of the existing concrete flood control channel because the project is not expected to increase the frequency or extent of operation and maintenance activities within the channel.

Operation of the new stormwater pump station equipment includes an electrical connection to the grid. The stormwater pump station would only require energy use during storm events when the pump station is needed to avoid flooding in the Granton Park neighborhood. A 150-kW generator powered by biodiesel would provide backup power to the pump station in the case of electrical failure. The amount of energy consumption resulting from operation of this equipment would be minimal because the equipment would only run during storm events and use of the equipment would be intermittent during operation. As a result, impacts associated with the wasteful, inefficient, or unnecessary consumption of energy resources would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.5-2: The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

The project is a flood-risk reduction project that does to require a significant amount of energy use by its nature. The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. The project would use low-carbon fuel equipment during construction and operation, in compliance with the LCFS. The project would comply

with the applicable ACC standards when employing vehicles and equipment during construction and operation of the project; therefore, impacts would be less than significant.

Mitigation: None required.

3.5.6 References

California Independent System Operator. (2020). Understanding the ISO. Retrieved June 28, 2020, from https://www.caiso.com/about/Pages/OurBusiness/Default.aspx

CARB. (2020). Low Carbon Fuel Standard. Retrieved from https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about

CARB. (2020). *The Advanced Clean Cars Program*. Retrieved May 10, 2017, from https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program

CEC. (2003, May 8). State of California Energy Action Plan. Retrieved June 28, 2020, from https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/2003%20Energy%20Action%20Plan.pdf

CEC. (2008, February). 2008 Update Energy Action Plan. Retrieved June 28, 2020, from https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/2008%20Energy%20Action%20Plan%20Update.pdf

CEC. (2019, November). 2019 California Energy Efficiency Action Plan. Retrieved from https://ww2.energy.ca.gov/business_meetings/2019_packets/2019-12-11/Item_06_2019%20California%20Energy%20Efficiency%20Action%20Plan%20(19-IEPR-06).pdf

CEC. (2020a). Oil Supply Sources To California Refineries. Retrieved from https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/oil-supply-sources-california-refineries

CEC. (2020b). California Electrical Energy Generation. Retrieved from https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-electrical-energy-generation

CEC. (2020c). Warren-Alqiust Act. Retrieved from https://www.energy.ca.gov/rules-and-regulations/warren-alquist-act

CPUC. (2020, June). About the California Public Utilities Commission (CPUC). Retrieved June 28, 2020, from https://www.cpuc.ca.gov/aboutus/

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

Marin County. (2007, November 6). Marin Countywide Plan.

Town of Ross. (2007, June). Town of Ross General Plan.

Town of Ross. (2020). *Municipal Code*. Retrieved July 29, 2020, from https://www.townofross.org/administration/page/municipal-code

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3.6 Geology and Soils

3.6.1 Introduction

This section includes an evaluation of the potential for the project to result in adverse impacts related to geologic, seismic, and soils hazards. The analysis is based on review of available geologic and geotechnical reports and maps of the project area and vicinity, including site-specific investigations conducted for the project. This section also includes relevant regulations, a discussion of potential project impacts, and appropriate mitigation measures, where necessary.

3.6.2 Scoping Comments

Comments related to geologic and soils hazards were received during the public scoping process. These comments and the location where they are addressed in the geology and soils analysis are provided in Table 3.6-1.

Table 3.6-1 Geology and Soils Scoping Comments

Agency/Entity	Comment	Location in Geology and Soils Section that Comment is Addressed
Garril Page	Marin's Countywide Plan is a resource: maps and geological reports as well as data collected during annual creek maintenance and dredging should be part of this EIR.	The Geology, Mineral Resources and Hazardous Materials Technical Background Report for Marin Countywide Plan has been reviewed during preparation of the Draft EIR. Relevant information is incorporated into Section 3.6.3 Environmental Setting of this Section.
Garril Page	Adding 11 -17 new larger fish resting pools to the channel bottom has unknown effect on the existing concrete structure's stability and safety.	Section 3.6.6, Impact 3.6-3
Garril Page	The new larger fish resting pools in the channel bottom creates unknown effect on the existing concrete structure's stability, coefficient of roughness, profile at the time of any given flood event.	

3.6.3 Environmental Setting

Geology

Regional Geology

Marin County is located in the central portion of the Coast Ranges Geomorphic Province[1] (CGS, 2002). The Coast Ranges province extends about 600 miles along the western edge of California and is bounded on the south by the Transverse Ranges, on the north by the Klamath Mountains, and on the east by the Great Valley. This province is marked by northwest-trending elongated ranges and narrow valleys that roughly parallel the coast and the San Andreas Fault Zone (SAFZ). Much of the Coast Ranges province is composed of marine sedimentary deposits, metamorphic rocks, and volcanic rocks.

The SAFZ separates the Point Reyes Peninsula in western Marin County from the eastern portion of Marin County. The bedrock east of the SAFZ consists of Mesozoic rocks unconformably overlain by Tertiary (Miocene and younger) deposits. The Mesozoic rocks consist of the Great Valley complex and the Franciscan complex. The Great Valley complex consists of accreted and deformed remnants of Jurassic oceanic crust and a thick sequence of turbidites (disturbed deep ocean sediments). The Franciscan complex rocks were probably Jurassic oceanic crust and Jurassic to Cretaceous pelagic deposits (marine sediments) overlain by Upper Jurassic to Upper Cretaceous turbidites. During the Late Cretaceous time, the Franciscan complex was subducted beneath the Coast Ranges, which resulted in deformed and sheared rocks. During late Miocene time, the regional tectonic regime changed and became dominated by the transform boundary of the San Andreas Fault system and deposition of sediments on the older complexes (USACE, 2010). As a result of this geologic activity, the region is characterized by narrow valleys flanked by steep-sided, almost parallel ridges, trending northwest and approximately parallel to the Pacific Ocean coastline. Most ridges are below 5,000 feet and many are below 3,000 feet. The most prominent feature within the Corte Madera Creek watershed is Mount Tamalpais (2,604 feet) (USACE, 2010). The Corte Madera Creek watershed's western boundary is a steep, forested ridge. Numerous creeks that drain steep upland areas onto relatively steep and laterally confined alluvial valley flats combine as San Anselmo Creek in Ross Valley at San Anselmo. San Anselmo Creek then flows southeast through Ross Valley along the Cretaceous sandstone ridge running southeast along the eastern edge of the basin (Stetson Engineers Inc., 2000). San Anselmo Creek and Ross Creek merge to form Corte Madera Creek west of the Lagunitas Road Bridge ~~flows into Corte Madera Creek west of Greenbrae at the confluence with Ross Creek~~. Ross Valley can be loosely characterized as a long, narrow, alluvial-filled trench carved by Corte Madera Creek (USACE, 1966, in USACE 2010).

[1] A geomorphic province is a regional area that possesses similar bedrock, structure, history, and age. California has 11 geomorphic provinces.

Local Geology

The geologic units underlying the project area consist primarily of valley fill/alluvium. Artificial fill overlying bay mud occurs in the lower portion of Unit 2, and Franciscan Complex is located north of Lagunitas Road as shown on Figure 3.6-1. A geotechnical investigation conducted for Corte Madera Creek concrete channel from College of Marin to Kentfield Hospital (Units 3 and 2). The results of the geotechnical investigation indicate that the soils within Unit 2 beneath the concrete channel consists of an upper layer of sand, and beneath it are silty and clayey soils (GHD, 2019).

Franciscan Formation

Bedrock underlying the Corte Madera Creek drainage is part of the Jurassic-Cretaceous Franciscan Formation. The Franciscan formation in this area consists of hard sandstone (greywacke) with minor amounts of shale and chert and occasional serpentinite and greenstone. These rocks have been folded into a series of complex anticlines and synclines during the latest episode of crustal deformation during mid-Pleistocene time, and were subsequently or contemporaneously highly fractured and faulted. In general, the trend of these geologic structures is northwestward. Present physical and topographical expression in the Corte Madera Creek basin is aligned along and controlled by this trend (USACE, 1966, in USACE 2010).

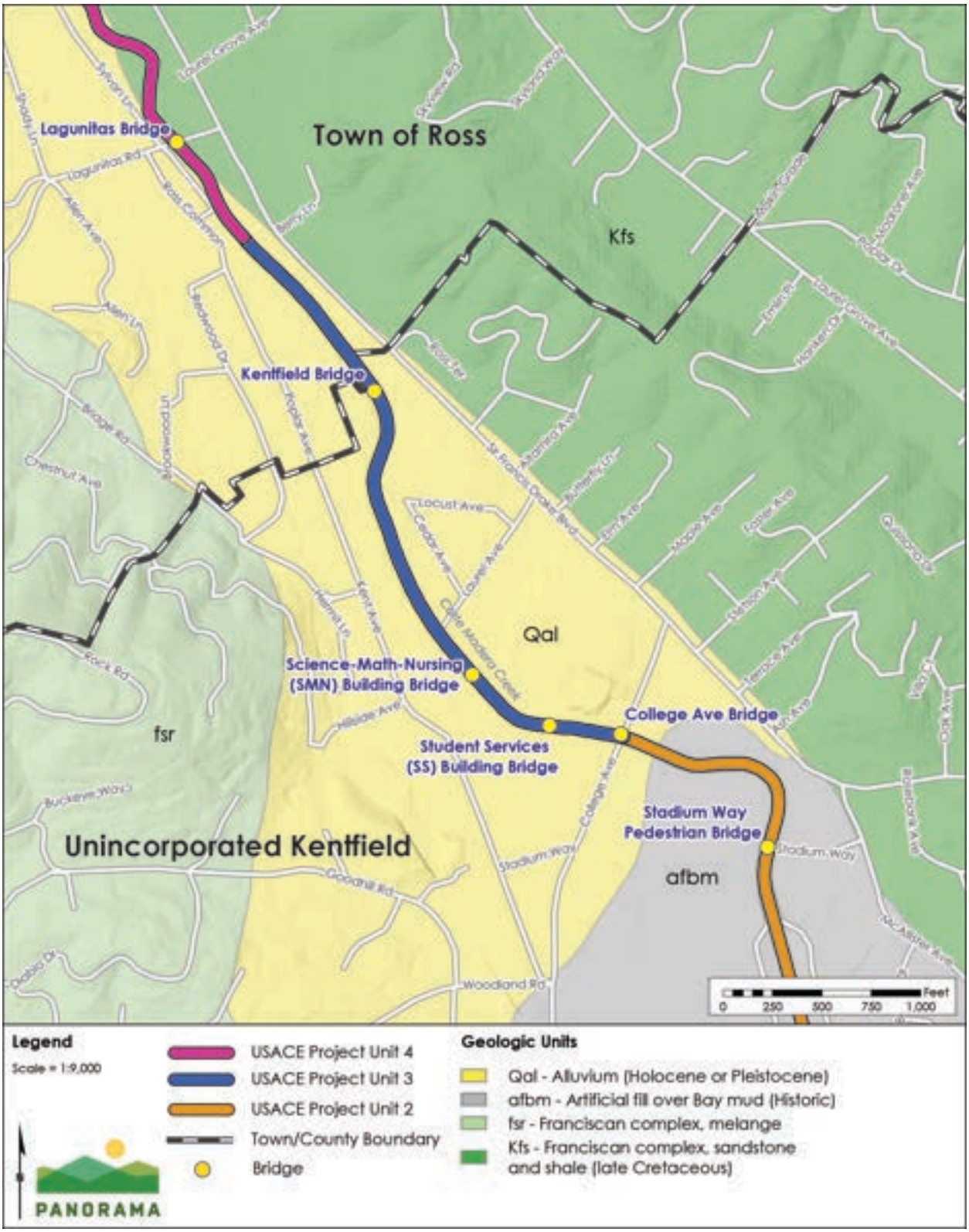
Near the upstream end of the project, at the Lagunitas Road Bridge, boring logs indicate the shallowest depth to bedrock is approximately 35 to 40 feet below ground surface (URS Corporation, 2009, in USACE 2010). The depth of bedrock is approximately 40 feet below ground surface near Kentfield and increases in depth towards the Bay (Stetson Engineers Inc., 2000). Sandstone bedrock has been reported 650 feet downstream of Stadium Way pedestrian bridge in Unit 2 at 63 feet below mean sea level (USACE, 1967, in USACE 2010).

Bay Mud

The watershed continues to experience ongoing tectonic uplift and faulting. Following the Pleistocene-Holocene transition (about 10,000 to 12,000 years ago), rising sea level and continuing tectonic uplift caused lower portions of eroding V-shaped upland valleys in Marin County watersheds to fill with sediment, creating u-shaped valleys (Stetson Engineers Inc., 2000). San Francisco Bay waters encroached upon and drowned the lower 2.5 miles of the ancestral Ross valley. The deposition of soft marine sediments formed the present-day tidal marshlands and mudflats (USACE, 1966, in USACE 2010). Holocene sea level rise probably influenced valley filling and flattened the valley slope in the alluvial channel network approximately below the City of San Anselmo (Stetson Engineers Inc., 2000).

The marine sediments are referred to as the "Buy Mud" formation, which attains a maximum thickness of approximately 125 feet in the center of Ross valley near U.S. Highway 101 (USACE, 2010). Bay Mud consists of silts and clays that are very soft to soft, wet, sticky, and structurally weak (USACE, 1966, in USACE 2010). The thickness of the Bay Mud ranges from 10 to 15 feet thick 850 feet downstream of Stadium Way pedestrian bridge and thins rapidly to 50 feet

Figure 3.6-1 Geologic Units



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, USGS 2009, US Geological Survey 2013)

downstream of Stadium Way pedestrian bridge. Upstream from Stadium Way pedestrian bridge, Bay Mud is reportedly absent and valley fill overlies bedrock. The geologic contact between Bay Mud and underlying valley fill materials is irregular and reflects the meandering nature of Corte Madera Creek in the past (USACE, 1967, in USACE 2010).

Valley Fill/Alluvium

Upstream of the marshland, the valley fill is composed of various mixtures of alluvial soils and slope-wash from the adjoining hills. The valley fill consists of interbedded sand and gravel, firm to stiff silt and clay, and lesser lenses of soft clay. The valley fill materials are generally stiff to dense and comparatively competent foundation materials (USACE, 1966, in USACE 2010; USACE, 1967, in USACE 2010).

Faults and Seismicity

This section characterizes the region's existing faults, describes historical earthquakes, estimates the likelihood of future earthquakes, and describes probable groundshaking effects.

Earthquake Terminology and Concepts

Earthquake Mechanisms and Fault Activity

Faults are planar features within the earth's crust that have formed to release strain caused by the dynamic movements of the earth's major tectonic plates. An earthquake on a fault is produced when these strains overcome the inherent strength of the earth's crust, and the rock ruptures. The rupture causes seismic waves that propagate through the earth's crust, producing the groundshaking effect known as an earthquake. The rupture also causes variable amounts of slip along the fault, which may cause displacement at the earth's surface.

Geologists commonly use the age of offset rocks as evidence of fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault would produce an earthquake, geologists examine the magnitude and frequency of recorded earthquakes and evidence of past displacement along a fault. The California Geological Survey (CGS) defines an active fault as one that has had surface displacement within Holocene time (within the last 11,000 years; the U.S. Geological Survey (USGS) uses within the last 15,000 years). A Quaternary fault is defined as a fault that has shown evidence of surface displacement during the Quaternary period (the last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not mean that a fault lacking evidence of surface displacement is necessarily inactive. The term "sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement has occurred on one or more of its segments or branches (CGS, 2018).

For the purpose of delineating fault rupture zones, the CGS historically sought to zone faults defined as potentially active, which are faults that have shown evidence of surface displacement during the Quaternary period. In late 1975, the State Geologist made a policy decision to zone only those faults that had a relatively high potential for ground rupture, determining that a fault should be considered for zoning only if it was sufficiently active and "well defined." Blind faults are faults that do not show surface evidence of past displacement, even if they occurred in

the recent past. Faults that are confined to pre-Quaternary rocks are considered inactive and incapable of generating an earthquake.

Earthquake Magnitude

When an earthquake occurs along a fault, its size can be determined by measuring the energy released during the event. A network of seismographs records the amplitude and frequency of the seismic waves that an earthquake generates. The Richter magnitude (M_L) of an earthquake represents the highest amplitude measured by the seismograph at a distance of 100 kilometers from the epicenter. Richter magnitudes vary logarithmically with each whole-number step, representing a tenfold increase in the amplitude of the recorded seismic waves and 32 times the amount of energy released. While Richter magnitude was historically the primary measure of earthquake magnitude, seismologists now use Moment Magnitude (Mw) as the preferred way to express the size of an earthquake. The Mw scale is related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the style of movement or displacement across the fault. Although the formulae of the scales are different, they both contain a similar continuum of magnitude values, except that Mw can reliably measure larger earthquakes and do so from greater distances.

Peak Ground Acceleration

A common measure of ground motion at any particular site during an earthquake is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. In terms of automobile acceleration, one "g" of acceleration is equivalent to the motion of a car traveling 328 feet from rest in 4.5 seconds. For comparison purposes, the maximum peak acceleration value recorded during the Loma Prieta earthquake was in the vicinity of the epicenter, near Santa Cruz, at 0.64 g. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place and is dependent on the distance from the epicenter and the character of the underlying geology (e.g., hard bedrock, soft sediments, or artificial fills).

Faults and Probable Earthquake Activity

The project area is in a seismically active region of California. The San Francisco Bay Area contains both active (Holocene age, or within the last 11,000 years) and potentially active (Quaternary age, or within the last 1.6 million years) faults and there is the potential for damage resulting from movement along any one of a number of the active faults throughout the area. The Working Group on California Earthquake Probabilities concluded there is a 72 percent probability of at least one magnitude 6.7 or greater earthquake before 2044 within the San Francisco Bay area (USGS, 2015). This earthquake is likely to occur on one of the seven major fault systems in the bay area. It was determined that the Hayward-Rodgers Creek, San Andreas and Calaveras fault systems have the highest probabilities of generating a magnitude 6.7 or greater earthquake before 2044. The Northern San Andreas (6.4 percent probability) and the Hayward-Rodgers Creek (14.3 percent probability) fault systems could have the greatest impacts on Marin County because of their proximity to population centers

within Marin County and the fact that they have the highest probability of rupture in the San Francisco Bay Region. There is also a 98 percent probability for a magnitude 6.0 or greater earthquake before 2044 in the San Francisco Bay region (USGS, 2015).

The project area is approximately 9 miles equidistant between the San Andreas and Hayward-Rodgers Creek Faults Zone, discussed below. The locations of these faults and their geographic relationship to the project area are shown in Figure 3.6-2.

San Andreas Fault Zone

The San Andreas Fault Zone is a major structural feature in the region and forms a boundary between the North American and Pacific tectonic plates (USGS, 2002) . The San Andreas Fault is a major northwest-trending, right-lateral, strike-slip fault that extends for about 600 miles from the Gulf of California in the south to Cape Mendocino in the north. The San Andreas is not a single fault trace but rather a system of active faults that diverges from the main fault south of the City of San Jose, California. The San Andreas Fault has produced numerous large earthquakes, including the 1906 San Francisco earthquake. That event had an estimated M_L 8.3 or Mw 7.8 (WGCEP, 2008) and was associated with up to 21 feet of displacement and widespread ground failure (Lawson, 1908). The project area is about 9 miles from the San Andreas Fault Zone. The San Andreas Fault Zone has a 6.4 percent probability of generating an earthquake with a magnitude equal to or greater than 6.7 Mw before 2044 (USGS, 2015).

Hayward-Rodgers Creek Fault Zone

The Hayward-Rodgers Creek Fault Zone is approximately 118 miles in length, located mostly along the base of the hills along the east side of San Francisco Bay and running parallel to the San Andreas Fault Zone. Similar to the San Andreas, it is composed of a system of active faults. The Hayward-Rogers Creek Fault has also produced numerous large earthquakes, including the 1868 earthquake with an estimated magnitude of about 7.0. The project area is about 10 miles from the Hayward-Rodgers Creek Fault Zone. The Hayward-Rodgers Creek Fault has a 14.3 percent probability of generating an earthquake with a magnitude equal to or greater than 6.7 Mw before 2044 (USGS, 2015).

The project area is not within an Alquist-Priolo Earthquake Fault Zone, and the area is not near any known active faults (USACE, 2010). Although no faults cross the project area, other faults in the region capable of producing earthquakes that could affect the project area include the Calaveras, San Gregorio, Concord-Green Valley, Greenville, and Mount Diablo faults (Marin County, 2005).

Geologic Hazards

Seismic Conditions

The San Andreas and Hayward faults are designated by the California Seismic Hazard Map with Maximum Credible Earthquake (MCE) magnitudes of 8.0 and 7.5, respectively. The California Seismic Hazard Maps for the region indicates that the closest mapped fault to the project area is the San Andreas Fault. The project area is in an area subject to severe to violent perceived ground shaking and expected damage to structures is moderate heavy to heavy from

a San Andreas Fault earthquake; and very strong to severe perceived ground shaking and expected damage to structures is moderate to moderate heavy from a North Hayward-Rogers Creek Fault earthquake (Marin County, 2005).

Liquefaction, Settlement, and Lateral Spreading

Strong ground shaking caused by large earthquakes can induce ground displacement and/or failure such as liquefaction, compaction settlement, and slope movement. A site's susceptibility to these hazards relates to the site topography, soil conditions, and depth to groundwater. In general, a relatively high potential for liquefaction exists in loose, sandy soils that are within 50 feet of the ground surface and are saturated (below the groundwater table). Liquefaction can result in loss of foundation support and settlement of overlying structures, ground subsidence and translation due to lateral spreading, and differential settlement of affected deposits. Lateral spreading occurs when a soil layer liquefies at depth and causes horizontal movement or displacement of the overburden mass on sloping ground or toward a free face such as a stream bank or excavation, or toward an open body of water. Settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials, particularly loose, uncompacted, and variable sandy sediments. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill. The liquefaction susceptibility in the project area ranges from moderate to very high (USGS, 2006). The soil types underlying the project area include Tocaloma-McMullin-Urban Land Complex and Xerorthents-Urban land complex (USDA, 2020). These soils have a depth to water table of more than 80 inches (USDA, 2020). The project area is likely to be subject to liquefaction and lateral spreading during large seismic events due to the high groundwater levels and alluvial deposits (consists of loose and unconsolidated silt, sand, clay, and gravel) onsite (USACE, 2018a).

Landslides

Typically, landslides and other slope stability hazards are activated in response to an increase in subsurface and surficial water content, earthquake shaking, the addition of load on a slope, or the removal of downslope support. The project area lies upon relatively flat ground, with the exception of the west and east headwalls on the banks of Corte Madera Creek. Landslide hazards are likely limited to potential slope instability. Excess sediment supply resulting from the February 2017 storms triggered numerous landslides in Unit 4 and creek bank slides appear to be continuing to work through the system (geomorphDESIGN, 2019). Bank instability or localized sloughing has also been reported by residents in Unit 4; however, these are small scale events resulting from the incised channel, instability from development along the creek, and the flashiness of the watershed (USACE, 2018b).

Figure 3.6-2 Faults in the Local Region

Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, U.S. Geological Survey and California Geological Survey 2010, US Geological Survey 2013)

Paleontological Resources

Paleontological resources are the fossilized remains or impressions of plants and animals, including vertebrates (animals with backbones; mammals, birds, fish, etc.), invertebrates (animals without backbones; starfish, clams, coral, etc.), and microscopic plants and animals (microfossils). Paleontological resources are nonrenewable, scientific resources that may be valuable in documenting the existence of extinct life forms and reconstructing the environments in which they lived. Fossils can be used to determine the relative ages of the depositional layers in which they occur and of the geologic events that created those deposits. The age, abundance, and distribution of fossils depend on the geologic formation in which they occur and the topography of the area in which they are exposed. The geologic environments within which the plants or animals became fossilized usually were quite different from the present environments in which the geologic formations now exist.

The Society of Vertebrate Paleontology published Standard Guidelines in response to a recognized need to establish procedures for the investigation, collection, preservation, and cataloguing of fossil bearing sites (SVP, 2010). The Standard Guidelines are widely accepted among paleontologists, followed by most investigators, and identify the two key phases of paleontological resource protection: (1) assessment and (2) mitigation. Assessment involves identifying the potential for a project site or area to contain significant nonrenewable paleontological resources that could be damaged or destroyed by project excavation or construction. Mitigation involves formulating and applying measures to reduce such adverse effects, including pre-project survey and salvage, monitoring and screen washing during excavation to salvage fossils, conservation and inventory, and final reports and specimen curation. The Society of Vertebrate Paleontology defines the level of potential as one of four sensitivity categories for sedimentary rocks: high, undetermined, low, and no potential as listed below.

1. **High Potential** – Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ashes or tephras), and some low grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine grained fluvial sandstones, argillaceous and carbonate rich paleosols, cross bedded point bar sandstones, fine grained marine sandstones, etc.). Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with

animal nests or middens and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.

2. **Undetermined Potential** – Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.
3. **Low Potential** – Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections or, based on general scientific consensus, only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e.g., basalt flows or recent (i.e., Holocene) colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.
4. **No Potential** – This designation is assigned to geologic formations that are entirely plutonic (volcanic rocks formed beneath the earth's surface) in origin and therefore have no potential for producing fossil remains.

In the context of CEQA, fossils of land dwelling and marine vertebrates, their environment, and associated geological, stratigraphical, taphonomical, and geographical data are considered important (i.e., significant) paleontological resources. Such fossils typically are found in river, lake, and bog deposits, although they may occur in nearly any type of sedimentary sequence.

A search of the University of California Museum of Paleontology collections database indicated one invertebrate fossil has been recovered from the Franciscan Formation (bedrock) in Corte Madera (UCMP, 2020).

Late Pleistocene and Holocene fossils have been recovered from marine sediments (Bay Mud) elsewhere in the San Francisco Bay area. For example, near the Bay Bridge San Francisco anchorage, remains of petrified wood, marine mollusks and mammals, bony fishes, amphibians, reptiles, birds, a diversity of extinct land mammals such as ground sloths, mammoth, mastodon, deer, horse, camel, and bison, and microfossils such as radiolaria, foraminifera, diatoms, pollen, and spores have been found in older Bay Mud. Fossil mollusk shells were reported in cores of Holocene younger Bay Mud from depths of approximately 20 and 25 feet near Candlestick Point in San Francisco (City and County of San Francisco , 2009).

Upstream from Stadium Way pedestrian bridge, Bay Mud is reportedly absent and valley fill overlies bedrock (refer to Figure 3.6-1). In the vicinity of the Lagunitas Road

Bridge within the upper reach of Unit 4, the sandy, lean clay and sandy gravel have no to low potential to contain unique paleontological resources (Town of Ross, n.d., in USACE 2010).Typical valley fill/alluvium in the project area consists of mixtures of alluvial soils and slope wash from the adjoining hills.

Unique Geologic Features

A unique geologic feature embodies distinctive characteristics of any regional or local geologic principles, provides a key piece of information important to geologic history, contains minerals not known to occur elsewhere in the county, and/or is used as a teaching tool. No unique geologic features were identified near or within the project area.

3.6.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

Although there are a number of federal laws, statutes, and regulations that would generally apply to the project, the federal government and its agencies have delegated the authority to implement and satisfy those requirements relevant to geology, seismicity, and soils to the state of California and its agencies, as discussed below.

State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to protect structures for human occupancy from the hazard of surface faulting. In accordance with the Alquist-Priolo Earthquake Fault Zoning Act, the State Geologist has established regulatory zones—called earthquake fault zones—around the surface traces of active faults and has published maps showing these zones.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. This Act requires the State Geologist to delineate various seismic hazard zones, and cities, counties, and other local permitting agencies to regulate certain development projects within these zones (CGS, 2019). The CGS is in the process of producing official maps based on USGS topographic quadrangles.

California Building Code

The California Building Code (CBC), which is codified in Title 24 of the California Code of Regulations, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, means of egress to facilities (entering and exiting), and general stability of buildings. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction. Title 24 is administered by

the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, location, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The 2016 edition of the CBC is based on the 2015 International Building Code published by the International Code Council, which replaced the Uniform Building Code. The code is updated triennially, and the 2016 edition of the CBC was published by the California Building Standards Commission on July 1, 2016, and took effect starting January 1, 2017. The 2016 CBC contains Appendix J Grading, which has been adopted by the County of Marin and includes the following provisions.

Section J101.2 requires that work in flood hazard area requires the preparation of an engineering analysis prepared by a registered design professional that demonstrates the work will not result in any increase in the level of the base flood.

Section J104.3 requires the preparation of a geotechnical report prepared by a registered design professional that shall describe the nature and distribution of existing soils; conclusions and recommendations for grading procedures; soil design criteria for any structures or embankments required to accomplish the proposed grading; and slope stability studies, where necessary.

Section J110.1 requires the faces of cut and fill slopes shall be prepared and maintained to control erosion. The control shall be permitted to consist of effective planting.

National Pollutant Discharge Elimination System Construction General Permit

Projects that disturb more than one acre of land during construction are required to comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. In the project area, the Construction General Permit is implemented and enforced by the San Francisco Bay Regional Water Quality Control Board, which administers the stormwater permitting program. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines.

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific construction best management practices (BMPs) designed to prevent sediment and pollutants from contacting stormwater from moving offsite into receiving waters. The BMPs fall into several categories,

including erosion control, sediment control, waste management and good housekeeping, and are intended to protect surface water quality by preventing the off-site migration of eroded soil and construction-related pollutants from the construction area. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. The SWPPP must be prepared before the construction begins. The SWPPP must contain a site map(s) that delineates the construction work area, existing and proposed buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Corte Madera Creek is not listed on the 303(d) list for sediment.[2]

Regional and Local Regulations

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007).

Water Resources

Goal WR-1: Healthy Watersheds. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.

> ***Policy WR-1.3: Improve Infiltration.*** Enhance water infiltration throughout watersheds to decrease accelerated runoff rates and enhance groundwater recharge. Whenever possible, maintain or increase a site's predevelopment infiltration to reduce downstream erosion and flooding.
>
> > *Implementing Program: WR-1.b Establish Development Standards for Infiltration.* Establish qualitative standards to maximize groundwater infiltration and minimize surface water runoff based on criteria developed by the Bay Area Stormwater Management Agency Associates. Standards should regulate the amount of impervious surfaces; vary by project type, land use, building-site placement, soils, and area characteristics; and provide for water impoundments, protecting and planting vegetation, cisterns, and other measures, such as restricting wet weather grading to increase groundwater recharge and reduce sedimentation.
> >
> > *Implementing Program: WR-1.f Require Stream Restoration Projects.* Require restoration of streams in conjunction with associated land use approvals to

[2] Corte Madera Creek is currently being addressed for diazinon with a U.S. Environmental Agency approved Total Maximum Daily Load (Regional Water Board, 2017).

improve groundwater recharge and filtration and to ensure high-quality water. Restoration projects should follow the design principles of natural channel restoration utilizing geomorphic concepts.

Goal WR-2: Clean Water. Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses.

Policy WR-2.3: Avoid Erosion and Sedimentation. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.

Implementing Program: WR-2.b Integrate Bay Area Stormwater Management Agencies Association Stormwater Quality Protection Guidelines into Permitting Requirements for All Development and Construction Activities. All projects should integrate stormwater pollution prevention design features for water quality protection to the extent feasible, such as those included in the Bay Area Stormwater Management Agencies Association Start-at-the-Source manual and the Tools Handbook.

The above-listed goals, policies, and implementing programs are implemented in the Marin County Stormwater Pollution Prevention Program, discussed further below.

Environmental Hazards

Goal EH-2: Safety from Seismic and Geologic Hazards. Protect people and property from risks associated with seismic activity and geologic conditions.

Policy EH-2.1 Avoid Hazard Areas. Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.

Implementing Program: EH-2.a Require Geotechnical Reports. Continue to require any applicant for land division, master plan, development approval, or new construction in a geologic hazard area to submit a geotechnical report prepared by a State-certified Engineering Geologist or a Registered Geotechnical Engineer that:

a. evaluates soil, slope, and other geologic hazard conditions;
b. commits to appropriate and comprehensive mitigation measures sufficient to reduce risks to acceptable levels, including post-construction site monitoring, if applicable;
c. addresses the impact of the project on adjacent lands, and potential impacts of off-site conditions; and

d. meets the requirements of other agency regulations with jurisdiction in the hazard area, such as Bay Conservation and Development Commission requirements for the safety of fills consistent with the Bay Plan.

Implementing Program: EH-2.b Require Construction Observation and Certification. Require any work or construction undertaken to correct slope instability or mitigate other geologic hazard conditions to be supervised and certified by a geotechnical engineer and/or an engineering geologist.

Marin County Municipal Code

The following code of Marin County Municipal Code is relevant to the project (Marin County , 2020).

Chapter 22.16 Discretionary Development Standards

22.16.030 General Standards.

J. Site preparation.

5. Geologic hazards. Construction shall not be permitted on identified seismic or geologic hazard areas such as on slide, on natural springs, on identified fault zones, or on bay mud without approval from the Department of Public Works, based on acceptable soils and geologic reports.

Town of Ross General Plan

The following policies of the Ross General Plan related to geology and soils are applicable to the project (Town of Ross, 2007).

Goal 5. Protecting Community Health and Safety, and Preparing for Emergencies

5.2 Geologic Review Procedures. At the time a development is proposed, Ross geologic and slope stability maps should be reviewed to assess potential geologic hazards. In addition, suitability for development must be based on site-specific geotechnical investigations.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related to geology and soils are applicable to the project (Town of Ross, 2020).

Chapter 12.28 Urban Runoff Pollution Prevention

12.28.090 Reduction of Pollutants in Urban Runoff. (1) Best Management Practices for Construction, New Development, and Redevelopment.

(A) Any person performing construction, development or redevelopment activities in the town that require a permit or approval under the Ross Municipal Code, including but not limited to approvals under Titles 15, 17 and 18, shall implement appropriate BMPs to prevent the discharge of construction wastes or

contaminants from construction materials, tools and equipment from entering a town storm drain or watercourse.

(B) Construction-phase BMPs include erosion and sediment controls and pollution prevention practices. Erosion control BMPs may include, but are not limited to, scheduling and timing of grading activities, timely revegetation of graded areas, the use of hydroseed and hydraulic mulches, and installation of erosion control blankets. Sediment control may include properly sized detention basins, dams, or filters to reduce entry of suspended sediment into the storm drain system and watercourses, and installation of construction entrances to prevent tracking of sediment onto adjacent streets. Pollution prevention practices may include designated washout areas or facilities, control of trash and recycled materials, tarping of materials stored on-site, and proper location of and maintenance of temporary sanitary facilities. The combination of BMPs used, and their execution in the field, must be customized to the site using up-to-date standards and practices. The agency will provide references to current guidance manuals and BMP information on request.

3.6.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it would:

a. Directly or indirectly cause potential substantial adverse effects, including the risk or loss, injury, or death involving:
   i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42.
   ii. Strong seismic ground shaking.
   iii. Seismic-related ground failure, including liquefaction.
   iv. Landslides.
b. Result in substantial soil erosion or the loss of topsoil.
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Approach to Impact Analysis

The following analysis discusses the potentially significant impacts of the project related to changes in geology and soils. The impact evaluation is based on the potential for the project to change geologic and soil conditions or expose facilities or people to unstable geologic conditions during project activities, using existing site conditions as a baseline for comparison. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section.

3.6.6 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criterion; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (e):** Implementation of the project would not involve installation of septic tanks or alternative wastewater disposal systems. No impacts would occur.

Impact Analyzed

Impact 3.6-1: The project could directly or indirectly cause potential substantial adverse effects, including the risk or loss, injury, or death involving: **i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42.** **ii. Strong seismic ground shaking.** **iii. Seismic-related ground failure, including liquefaction.** **iv. Landslides.**	**Significance Determination**
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant with Mitigation

Rupture of a Known Earthquake Fault

The project area is not located within an earthquake fault zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act, and no active or potentially active faults exist on or in the immediate vicinity of the site. Although fault rupture could occur on unknown faults, fault rupture is not expected in the project area. Project construction would only last seven months and would not introduce a substantial number of people to the area. Operation and maintenance of the project would not introduce additional people or structures to the area that

would increase the risk of loss, injury or death in the unlikely event of fault rupture. The concrete channel removal in Frederick Allen Park and lower Unit 2 would reduce the risk of structural failure from fault rupture because the earthen channel would be less susceptible to failure than the concrete channel. The new segments of floodwalls in Units 2 and 3 would be located along the existing floodwalls and would be generally 2 to 4 feet tall. The new segments of floodwall would not increase the risk of loss, injury, or death from fault rupture. The impact would be less than significant.

Seismic Ground Shaking

The project is not within a designated seismic hazard zone and is not subject to the Seismic Hazards Mapping Act. The nearest fault to the project site is the San Andreas Fault, which is located approximately 9 miles to the west of the project area. The Hayward Fault is approximately 10 miles east of the project area and the Rodgers Creek Fault is approximately 15 miles northeast of the project area. Ground shaking is the primary cause of earthquake damage to man-made structures, strong ground shaking could cause shearing, differential settlement, or heave of structures, causing damage to buildings and structures. The project is located in an area of high seismicity where severe to violent ground shaking could result from a large earthquake on the San Andreas Fault Zone and very strong to severe ground shaking could result from earthquakes on either the North Hayward or Rodgers Creek Faults.

Construction

In the event of an earthquake, construction workers could be exposed to hazards from strong seismic ground shaking. Project construction would not substantially increase these risks of exposure over typical risks of exposure throughout the region. Earthquake safety training pursuant to Occupational Safety and Health Administration (OSHA) regulations would minimize potential for impacts to workers. Due to the short duration of construction (seven months), the low probability of a strong seismic event occurring during the construction timeframe, and safety training for construction crews, the potential construction impact would be less than significant.

Operation A significant seismic event is likely to occur over the lifetime of the project. Shaking associated with a seismic event could cause damage to built features of the project, including the new segments of floodwall, streambank stabilization structures, and the stormwater pump station.

Unit 4

The grading and streambank stabilization improvements to the natural creek channel would have the overall effect of increasing stability by incorporating bank stabilization and vegetation into the design that would limit erosion. The streambank stabilization measures would reduce susceptibility of the creek banks to failure caused by seismic shaking and seismically induced ground failures. Because the project would increase the channel stability in Unit 4 through implementation of streambanks stabilization measures, the impact on risk of loss, injury, or death from seismic shaking would be less than significant.

Frederick Allen Park

The existing flood control channel wall is a concrete structure that is prone to damage under strong seismic events, whereas the proposed natural vegetated channel in Frederick Allen Park would be less prone to damage and loss under a strong seismic event. The new segments of retaining wall within Frederick Allen Park (at the transition to Unit 4 and at the transition to the concrete channel in lower Unit 3) would be up to 10 feet tall and could be prone to damage and loss in the event of strong seismic shaking if appropriate geotechnical evaluation and recommendations were not implemented. The damage or loss of the retaining wall in Frederick Allen Park due to strong seismic shaking would be a significant impact. The District would implement **Mitigation Measure 3.6-1: Geotechnical Investigation Report**, which requires a site-specific geotechnical investigation and implementation of the geotechnical recommendations that would address risk of seismicity. Because the mitigation requires implementation of the geotechnical recommendations, the impact from strong seismic shaking would be less than significant with mitigation.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station

The new segments of floodwall in Units 3 and 2 would be generally 2 to 4 feet tall. The floodwall would be designed in accordance with the U.S. Army Corps of Engineers (USACE) design requirements and is subject to USACE approval under Section 408. The floodwall would be designed to meet current design standards to avoid increased risk of structural failure in the event of strong seismic shaking. While the floodwall would be short (2 to 4 feet tall) and not in proximity to people or other structures, failure of the floodwall as a result of seismic shaking could result in risk of loss, injury or death if the floodwall were not repaired prior to a major storm/flood event. If the floodwall were damaged and not repaired, increased flooding and damage could occur in areas that are being protected by the floodwall, which would be a significant impact. **Mitigation Measure 3.6-1: Geotechnical Investigation Report** requires a site-specific geotechnical investigation and implementation of the geotechnical recommendations in final design of the floodwalls to address the risk of structural damage due to seismicity. The new floodwall segments in Units 2 and 3 would have less-than-significant impacts with mitigation related to risk of loss, injury, or death from seismic shaking.

The stormwater pump station would be below grade with the exception of a utility cabinet that would extend approximately 6 feet above grade. The utility cabinet would be an isolated structure that would not be located near any homes or people. The belowground pump station components have been engineered and are located adjacent to the existing concrete flood control channel wall. The additional concrete and pump station components would not increase the risk of floodwall failure. The stormwater pump station would not increase risk of loss, injury or death due to seismic shaking because the pump station would not be located near people or other structures and would not be vulnerable to collapse; therefore, the impact would be less than significant.

Lower College of Marin Concrete Removal

The concrete removal in lower Unit 2 would result in a natural channel that would have reduced risk of failure from strong seismic shaking because the channel would be gently sloped

and vegetated. The concrete removal in Unit 2 would not introduce any infrastructure that could result in risk of loss, injury, or death from seismic shaking. The operation of the Unit 2 concrete channel removal would have a less-than-significant impact on risk of loss from seismic shaking.

Seismic-Related Ground Failure

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength due to increases in pore pressure during periods of earthquake-induced strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude and frequency of earthquakes in the surrounding region. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects.

Lateral spreading is a seismically induced ground deformation failure in which near surface soil layers typically break into blocks that progressively move downslope or toward a nearby free face such as a stream channel, river embankment, or a shoreline. Structural elements (e.g., concrete channel, grade control, and slope protection, etc.) that extend through or across a zone of lateral spreading may be pulled apart or sheared.

The project area is in an area mapped by U.S. Geological Survey as having "very high" liquefaction susceptibility (USGS, 2006). Potentially liquefiable materials within the project area include loose sandy layers in the valley fill and soft sandy silt in the creek sediments. Groundwater in the channel is approximately 5 feet below grade in Unit 3. The Bay Mud underlying the downstream of Stadium Way pedestrian bridge in Unit 2 has low potential for liquefaction.

Construction

Construction would introduce construction workers to the area for up to seven months. The construction period would involve grading, removal of concrete, planting, and installation of new concrete floodwalls. Construction would not introduce large structures to the area that would put people at risk of injury or death from liquefaction. Due to the low number of workers (less than 100) that would be required during construction, short duration of construction, and low height of project structures, project construction would have a less-than-significant impact on liquefaction.

Operation

Liquefaction-induced lateral spreading could occur along the floodwalls and slopes with valley fill. Removal of the concrete flood control channel in Frederick Allen Park and lower Unit 2 and the rocks and riprap proposed in Units 4 and 2, and Frederick Allen Park would improve stability of the channel banks and reduce the potential for impacts related to lateral spreading. Because the project would reduce the area of concrete structures that could be subject to damage in the event of liquefaction or lateral spreading, and the project would be designed to

meet stringent federal and state seismic design standards, the project would be less prone to damage form liquefaction and lateral spreading than the existing conditions. As such, the project would not expose persons or structures to substantial adverse effects or exacerbate existing conditions related to ground failure, including liquefaction and the impact would be potentially beneficial and less than significant.

Landslides

The project area is located mostly within flat lands with surrounding slopes identified as containing few if any landslides. A search of the U.S. Landslide Inventory indicated that no landslides have been mapped within the proximity of the project area (USGS, 2020). As discussed above in Section 3.6.3 Environmental Setting, recent storms in 2017 have triggered numerous landslides upstream in Unit 4, but these are small scale events caused by the incised channel and instability from development along the creek. The project would include installation of grade control structures to stabilize the creek banks in Unit 4, which would reduce the risk of landslides in the area. The project would not increase the risk of landslides. No landslide-related impact would occur.

Mitigation: Implement Mitigation Measure 3.6-1.

Mitigation Measure 3.6-1: Geotechnical Investigation Report

The District shall have a professional geotechnical engineer conduct a geotechnical investigation to evaluate the potential for geotechnical hazards to occur on-site in accordance with the recommendations of the California Geological Survey. The Geotechnical Investigation Report shall provide site-specific recommendations for structures (e.g., floodwalls, fish pools, and stormwater pump station), work areas, and access routes where there is an elevated risk of geologic hazards. The Geotechnical Investigation Report shall be incorporated into the final project design of the retaining walls and floodwalls. The Geotechnical Investigation Report shall specify exact design coefficients that are needed by structural engineers to determine the type and sizing of structural materials. The Geotechnical Investigation Report shall be subject to performance criteria imposed by the California Building Code, as applicable. The Geotechnical Investigation Report shall be prepared by a registered civil engineer or certified engineering geologist and include appropriate measures to minimize seismic hazards and ensure structural safety of the proposed structures.

Significance after Mitigation: Mitigation Measure 3.6-1 would require the District to prepare a geotechnical investigation report and incorporate geotechnical recommendations in the final design. Implementation of Mitigation Measure 3.6-1 would reduce the impact from seismic shaking during operation to less than significant because the project would be designed to avoid damage from strong seismic events.

	Significance Determination
	Construction: Less than Significant
Impact 3.6-2: The project would not result in substantial soil erosion or the loss of topsoil.	**Operation and Maintenance: Less than Significant**

Construction

Project construction would include soil disturbing activities, including removal of the concrete channel within Frederick Allen Park and lower Unit 2, grading in Unit 4, tree removal, and excavation of larger fish pools. Without proper soil stabilization controls, construction activities including excavation and grading, and tree removal can increase the potential for exposed soils to be eroded by wind or stormwater runoff, resulting in long term soil loss. As discussed in Section 3.9 Hydrology and Water Quality, land disturbance associated with the project would be more than 1 acre and coverage under the Construction General Permit would be required. The proposed project would be required to develop and implement a SWPPP. Construction activities would be conducted consistent with Water Discharge Requirements prescribed for compliance with the state's Porter-Cologne Water Quality Control Act and BMPs outlined in the SWPPP. In conformance with the SWPPP and construction standards, erosion control methods would be implemented to prevent loss of soil at all work sites. The project design includes streambank stabilization measures to reduce the potential for soil loss, as described in Chapter 2, Project Description. In addition, Marin County has adopted the CBC Appendix J grading requirements, including preparing and maintaining the cut and fill slopes to control erosion. The streambank stabilization measures included in the project design and implementation of the sediment and erosion control BMPs included in the SWPPP would ensure that soil erosion and the loss of topsoil immediately following construction are less than significant.

Operation and Maintenance

The proposed project would ~~will~~ require removal of trees and vegetation within Frederick Allen Park and within Unit 2 to create natural habitat. The area of tree removal would be replaced with native vegetation including shrubs, grasses, and riparian trees. Revegetation would provide long-term stabilization to avoid substantial soil loss. The area of grading and excavation at the stormwater pump station and the floodwalls would be permanently stabilized by the project elements that would be installed in the area, including gravel and concrete. Long-term maintenance activities in Frederick Allen Park would be the responsibility of the District, as specified in the maintenance MOU between the Town of Ross and the District. Long-term maintenance activities would include maintenance of landscaping and streambank stabilization control structures to ensure they function over the project life. Maintenance activities also include maintenance of vegetation and removal of sediment from the fish pools. The removal of sediment from the project fish pools would be similar sediment removal from the existing fish pools and the impact would be less than significant. Maintenance activities would ensure proper function of the project and long-term effectiveness of streambank stabilization features. The impacts from erosion and soil loss would be less than significant because the project design incorporates revegetation and streambank stabilization features to minimize soil loss.

Mitigation: None required.

	Significance Determination
Impact 3.6-3: The project would be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Geologic and Soil Unit Stability

The project area consists of three geologic units, including the Franciscan Formation, Bay Mud, and valley fill/alluvium. The Franciscan Formation bedrock and valley fill/alluvium are comparatively strong and competent foundation materials. Bay Mud consists of silts and clays that are very soft and structurally weak. Bay Mud is found downstream of Stadium Way pedestrian bridge in Unit 2 beneath the artificial fill. Upstream from Stadium Way pedestrian bridge, Bay Mud is reportedly absent. As discussed in the Environmental Setting, the Franciscan Formation bedrock is approximately 35 to 40 feet below ground surface near the upstream end of the project and approximately 40 feet below ground surface near Kentfield and increases in depth towards the Bay. The project would require grading and excavation within Frederick Allen Park, Unit 4, and lower Unit 2. The grading and excavation would be greatest at Frederick Allen Park and would extend up to 10 feet below the current ground surface. The potential for the project to encounter bedrock is low because the maximum excavation would not extend to bedrock. The soil types underlying the project include Tocaloma-McMullin-Urban Land Complex and Xerorthents-Urban land complex (USDA, 2020). These urban land complex soils likely consist of artificial fill materials that have been compacted by roadways, the concrete channel, and urban activity.

Retaining Walls and Floodwalls

The project would include installation of 10-foot tall retaining walls in the approximate location of the existing flood control channel at the upstream end of Frederick Allen Park and connection to Unit 4 and at the downstream end of Frederick Allen Park, construction of larger fish pools within the concrete channel in Unit 3, installation of 2 to 4 foot tall floodwalls along the existing floodwall, removal of portions of the concrete channel to create natural habitats in Frederick Allen Park and at lower College of Marin, and installation of a stormwater pump station. The new structures including the retaining walls and floodwalls would be installed on soil units that primarily consist of urban fill in the urban environment. The Franciscan Formation and valley fill alluvium underlying the retaining walls and floodwalls are stable geologic and soil units and the soils would not become unstable as a result of the retaining wall or floodwall installation. The retaining walls and floodwalls would be similar to the existing concrete channel floodwalls and would not cause geologic or soil instability; therefore, the impact would be less than significant.

Frederick Allen Park and Fish Pools

The excavation of the floodplain at Frederick Allen Park and excavation of larger fish pools within the concrete channel would occur within the Franciscan formation and valley fill

alluvium, which are stable soil and geologic units. The project would include installation of streambank stabilization measures including large rock, vegetated soil lifts, and landscaping within Frederick Allen Park and immediately upstream. The project also includes installation of concrete and rock within the fish pools. The project would not cause geologic or soil units to become unstable because the underlying geologic and soil units are stable, and the project has incorporated soil stabilization measures into the design. The impact form construction of the floodplain and habitat at Frederick Allen Park and the fish pools would be less than significant because the habitat and fish pools would be located on stable geologic and soil units and the project design includes soil stabilization features.

Lower College of Marin

The Bay Mud underlying the lower College of Marin concrete channel removal area is weak. The lower College of Marin concrete channel removal work involves removal of a portion of the existing concrete channel and riprap, creating a less steeply sloped habitat area and planting the area to establish saltwater marsh and transitional habitat. Riprap would be reinstalled as needed for stability. The reduced slope of the created habitat relative to existing conditions, and use of soil stabilization, including riprap reuse, would generally stabilize the underlying soils. In addition, Marin County Municipal Code requires the Department of Public works to review acceptable soils and geologic reports prior to construction activities located on Bay Mud. ~~Per these regulatory requirements, the geotechnical investigation report for the lower College of Marin concrete channel removal, which is located on Bay Mud, will~~ The Miller Pacific geotechnical report prepared by for the Lower College of Marin Project includes detailed information related to soils matters such as stability, erosion; and settlement, and ~~will~~ includes recommendations for remediating ~~expansive soils~~, ~~which may include, for example,~~ including removal of these soils and ~~replacement~~ replacing them with ~~engineered~~ imported fill. With adherence to the Marin County Municipal Code, the project would have a less than significant impact due to its location on unstable soil units.

Subsidence

Subsidence is commonly associated with severe, long-term withdrawal of groundwater in excess of recharge that eventually leads to overdraft of the aquifer. The project would include temporary groundwater dewatering in the location of excavation including the fish pools and lower Unit 2 construction. Groundwater dewatering would be localized and would only occur for a few weeks during construction in each area. No long-term groundwater withdrawal would occur. The short-term dewatering would not cause subsidence. No subsidence-related impacts would occur.

Liquefaction, Lateral Spreading and Landslides

Liquefaction, lateral spreading, and on- or off-site landslide impacts as analyzed above in Impact 3.6-1. The impact from liquefaction and lateral spreading would be less than significant, as discussed in Impact 3.6-1. The project would not result in a landslide on or off-site. No landslide impact would occur.

Mitigation: None required.

	Significance Determination
Impact 3.6-4: The project would not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), and thus would not create substantial direct or indirect risks to life or property.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

The soil types underlying the project include Tocaloma-McMullin-Urban Land Complex and Xerorthents-Urban land complex. The Tocaloma-McMullin complex has low extensibility, or expansion potential. The extensibility rating for the Xerorthents-Urban land complex was not available from the NRCS web soil survey. However, the soil expansion potential is anticipated to be low because the soil complex is fill and heavily developed. The project does not involve construction of habitable structures or structures that could create a substantial risk to life or property in the case of soil expansion. The floodwalls will be located on top of existing floodwalls or setback from existing floodwalls and would not change the soil types or risk of expansive soils below the existing floodwalls. Marin County Municipal Code requires the Department of Public works to review acceptable soils and geologic reports prior to construction activities located on Bay Mud. Per these regulatory requirements, the geotechnical investigation report for the lower College of Marin concrete channel removal, which is located on Bay Mud, will include detailed information related to soils matters such as stability, erosion; and settlement, and will include recommendations for remediating expansive soils, which may include, for example, removal of these soils and replacement with engineered fill. With adherence to the Marin County Municipal Code, the project would have a less than significant impact with respect to expansive soils.

Mitigation: None required.

	Significance Determination
Impact 3.6-5: The project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Overview

Portions of the project area where ground disturbance will occur are underlain by Late Pleistocene and Holocene Bay Mud and valley fill/alluvium. Typical valley fill/alluvium in the project area consists of mixtures of alluvial soils and slope wash from the adjoining hills. Because it consists of recently deposited sediments, surficial exposures of alluvium are considered to have low potential for paleontological resources. Although numerous invertebrate fossils such as mollusk shells have been observed in the Young Bay Mud, due to its young age, the Holocene Young Bay Mud is considered to have low potential for significant fossils. The project is not located near or within a unique geologic feature. Therefore, the project would not affect a unique geologic feature.

Construction

Construction of the project would require ground-disturbing and excavation during removal of the fish ladder and grading of Unit 4, removal of the concrete channel and construction of a

floodplain and realigned channel in Frederick Allen Park, excavation of larger fish pools, construction of the stormwater pump station, and removal of concrete at the lower College of Marin. There is a low potential to uncover previously undiscovered paleontological resources during ground-disturbing work because paleontological resources are not anticipated in sediments and rocks in the project area. The impact of construction on paleontological resources is less than significant.

Operation and Maintenance
Once constructed, the project would include maintenance activities, such as vegetation management, sediment and debris removal, and storm drain pump station and floodwall maintenance. These activities would not include ground-disturbing work. No impact on paleontological resources would occur.

Mitigation: None required.

3.6.7 References

Association of Bay Area Governments Resilience Program. (2020). *Modified Mercalli Intensity Scale (MMI)*. Retrieved August 19, 2020, from http://resilience.abag.ca.gov/shaking/mmi/

CDC. (2015). Retrieved August 7, 2020, from https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=tsunami

CGS. (2002, December). *California Geomorphic Provices Note 36.* Retrieved from https://www.contracosta.ca.gov/DocumentCenter/View/34134/CGS-2002-California-Geomorphic-ProvincesNote-36-PDF

CGS. (2018). A Guide for Government Agencies, Property Owners/Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California . *Earthquake Fault Zones* .

CGS. (2019). *Seismic Hazards Mapping Act*. Retrieved July 7, 2020, from California Department of Conservation California Geological Survey: https://www.conservation.ca.gov/cgs/shma

City and County of San Francisco . (2009, November). Candlestick Point-Hunters Point Shipyard Phase II Development Plan Project Draft Environmental Impact Report .

geomorphDESIGN. (2019, October 24). Self-Adjusted Channel Bed Elevation Geometry Files for Unit 4 Corte Madera Creek Flood Control Channel for Four Improvement Scenarios Administrative Draft Technical Memorandum.

GHD. (2019, June). Corte Madera Creek College of Marin to Kentfield Hospital Structural Assessment Draft Technical Memorandum.

Lawson, A. C. (1908). The California Earthquake of April 18, 1906, Report of the State Earthquake Investigation Commission.

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Marin County . (2020). *Chapter 22.16 Discretionary Development Standards*. Retrieved from Marin County Municipal Code: https://library.municode.com/ca/marin_county/codes/municipal_code?nodeId=TIT22DECO_ARTIIZODIALLAUS_CH22.16DIDEST_22.16.030GEST

Marin County. (2005, November). Marin Countywide Plan: Geology, Mineral Resoruces and Hazardous Materials Technical Background Report .

NRCS. (2020, July 6). Custom Soil Resource Report for Marin County, California.

Regional Water Board. (2017, April 26). *2016 California List of Water Quality Limited Segments Beging Addressed by USEPA Approved TMDLs*. Retrieved August 20, 2020, from https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/2016_303d/category4a_report.shtml

Stetson Engineers Inc. (2000, December 31). Geomorphic Assessment of the Corte Madera Creek Watershed.

SVP. (2010). Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources . Society of Vertebrate Paleontology Impact Mitigaiton Guidelines Revision Committee.

Town of Ross. (2007, June). Town of Ross General Plan.

Town of Ross. (n.d., in USACE 2010). Lagunitas Road Bridge Repalcement Projet, Draft EIR Initial Sutdy Checklist.

UCMP. (2020, July 13). *UC Mesume of Paleontology Localities - Marin County*. Retrieved from https://ucmp.berkeley.edu/collections/databases/

URS Corporation. (2009, in USACE 2010, February). Lagunitas Road Bridge Replacement Project Foundation Report.

USACE. (1966, in USACE 2010). Design Memoradum No. 1, Corte Madera Creek Flood Control Project, Marin County, as in the December 2010 Corte Madera Creek Flood Control Study Final Baseline Report.

USACE. (1967, in USACE 2010). Design Memorandom No. 2, Corte Madera Creek Flood Control Project, Marin County, California, Units 2 and 3 ,as in the December 2010 Corte Madera Creek Flood Control Study Final Baseline Report.

USACE. (2010, December). Corte Madera Creek Flood Control Study Baseline Report .

USACE. (2018a, October). Appendix P Geotechnical Report for Draft Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) of Corte Madera Creek Flood Risk Management Project.

USACE. (2018b, October). Corte Madera Creek Flood Risk Management Project Environmental Impact Statement/Environmental Impact Report.

USDA. (2020, July 6). Custom Soil Resource Report for Marin County, California.

USGS. (2002, December 10). San Andreas Fault Zone, Creeping Section (Class A) No. 1e. *Quaternary Fault and Fold Database of the United States*.

USGS. (2006). Liquefaction Susceptibility. *Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California Open-File Report 06-1037*.

USGS. (2011). Population and Business Exposure to Twenty Scenario Earthquakes in the State of Washington. *Open-File Report 2011-1016*.

USGS. (2015, March). UCERF3: A New Earthquake Forecast for California's Complex Fault System Fact Sheet 2015-3009.

USGS. (2020). *U.S. Landslide Inventory*. Retrieved August 6, 2020, from https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=ae120962f459434b8c904b456c82669d

WGCEP. (2008). The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2). *USGS Open File Report 2007-1437, CGS Special Report 203*.

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3.7 Greenhouse Gas Emissions

3.7.1 Introduction

This section addresses the existing greenhouse gas (GHG) emissions conditions and presents an evaluation of the potential GHG emissions effects from implementation of the project. The GHG emissions analysis is based on GHG emissions modeling of project construction and operation activities. Modeling assumptions and calculations are provided in Appendix C.

3.7.2 Scoping Comments

Comments related to GHG emissions impacts were received during the public scoping process. These comments and the location where they are addressed in the GHG emissions analysis are provided in Table 3.7-1.

Table 3.7-1 Greenhouse Gas Emissions Scoping Comments

Agency/Entity	Comment	Location in GHG Emissions Section that Comment is Addressed
California State Lands Commission	A GHG emissions analysis consistent with the California Global Warming Solutions Act (Assembly Bill [AB] 32) and required by the State CEQA Guidelines should be included in the Draft EIR. This analysis should identify a threshold for significance for GHG emissions, calculate the level of GHGs that will be emitted as a result of construction and ultimate build-out of the Project, determine the significance of the impacts of those emissions, and, if impacts are significant, identify mitigation measures that would reduce them to the extent feasible. For the proposed Project, the removal and disposal of the concrete in Unit 2 may result in substantial emissions.	Section 3.7.6 and Appendix C

3.7.3 Environmental Setting

Climate Change

Overview

Global climate change refers to changes in average climatic conditions on earth as a whole, including changes in temperature, wind patterns, precipitation, and storms. Historical records indicate that global climate changes have occurred in the past due to natural phenomena; however, current data increasingly indicate that current global conditions differ from past climate changes in rate and magnitude. Global climate change attributable to anthropogenic (human) GHG emissions is currently one of the most important scientific, economic, and political issues in the United States and the world. The appropriate actions to limit and/or

respond to climate change are the subject of significant and rapidly evolving regulatory efforts at the federal and state levels of government.

The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change; occurrence, frequency, and magnitude of extreme weather events; effects of aerosols; changes in clouds; shifts in the intensity and distribution of precipitation; and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model it, the uncertainty surrounding climate change may never be completely eliminated. Nonetheless, the International Panel on Climate Change's (IPCC) *Fifth Assessment Report, Summary for Policy Makers* states, "It is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forces together" (IPCC, 2014). A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC in that climate change is very likely caused by human (i.e., anthropogenic) activity (Anderegg, Prall, Harold, & Schneider, 2010).

Effects of Climate Change

Some of the effects of global warming in California are likely to include loss of snowpack, reduced water availability, declining crop yields, sea-level rise, more extreme heat days per year, more high ozone days, more large forest fires, more drought years, increased erosion of California's coastlines and sea-water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems, and increased pest infestation (CARB, 2008; USEPA, 2016). Globally, climate change has the potential to adversely affect numerous environmental resources through impacts related to future air temperatures and precipitation patterns. According to the IPCC, the projected effects of global warming on weather and climate are likely to vary regionally but are expected to include the following direct effects (IPCC, 2014):

- Warmer and/or fewer cold days and nights over most land areas
- Warmer and/or more frequent hot days and nights over most land areas
- Warm spells/heat waves, including increased frequency and/or duration over most land areas
- Heavy precipitation events, including increased frequency, intensity, and/or amount of heavy precipitation
- Increase in intensity and/or duration of drought
- Increase in intense tropical cyclone activity
- Increased incidence and/or magnitude of extreme high sea level

Climate change is projected to cause many secondary effects as well, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully

understood and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

Sources of Greenhouse Gas Emissions

There are two broad sources of GHG emissions: anthropogenic and biogenic.

- Anthropogenic GHG emissions derive from the combustion of fossil fuels. Energy-related CO_2 emissions, resulting from fossil-fuel exploration and use, account for approximately 85 percent of the human-generated GHG emissions in the United States, primarily in the form of CO_2 emissions from burning fossil fuels (USEPA, 2017). Anthropogenic emissions also include byproducts of certain human--managed biological processes, such as anaerobic decomposition of organic waste in landfills, wastewater treatment, and treatment of wastes from confined animal facilities such as dairies. Indirect anthropogenic effects on GHG emissions includes changes in land use from uses with high levels of carbon sequestration, such as forests, to agricultural or urban uses.
- Biogenic GHG emissions are derived from natural sources, including the natural decomposition of biomass[1] and combustion of biomass or biomass-derived fuels.

The distinction between anthropogenic and biogenic sources of GHG emissions is important because these sources have different impacts on the global carbon cycle. Carbon in fossil-fuel reservoirs, such as coal seams and oil and gas deposits, was removed from the atmosphere by plants over millions of years. Through geologic processes, this carbon accumulated in deposits and was isolated from the active carbon cycle. Without human intervention, fossil-fuel carbon would remain isolated from the active carbon cycle into the future. Through extraction and combustion of fossil fuels, humans release this carbon, increasing the total amount of carbon in the atmosphere and in the active carbon cycle (USEPA, 2011).

In contrast to fossil-fuel carbon, carbon present in biomass is cycling through the atmosphere and global carbon cycle on a much faster scale. Over short time scales, the mass of carbon released by the decomposition of biomass will generally equal the mass of carbon taken up by living organisms. Because biogenic carbon is constantly being released and taken up in the carbon cycle, biogenic CO_2 emissions do not act to increase the total amount of carbon in the atmosphere in the same way as the release of carbon from fossil fuels (USEPA, 2011).

Types of Greenhouse Gases

The greenhouse gas effect is responsible for maintaining a habitable climate. The most common GHGs are CO_2 and water vapor. Other critical GHGs include methane (CH_4), nitrous oxide

[1] Biomass is non-fossilized organic matter from plants, animals, and microorganisms, including products, byproducts, and wastes from agriculture, forestry and related industries as well as the non-fossilized biodegradable fractions of industrial and municipal wastes, including gases and liquids recovered from its decomposition.

(N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). GHGs are released into the earth's atmosphere through a variety of natural processes and human activities. Each GHG has its own potency and effect upon the earth's energy balance, expressed in terms of a global warming potential (GWP). Some common emissions sources of GHGs are listed in Table 3.7-2. The GWPs provided in Table 3.7-2 are values based on the latest science in the IPCC's Fifth Assessment Report (AR5) (IPCC, 2013).

As shown below, CO_2 is assigned a value of 1, and SF_6 is several orders of magnitude stronger, with a GWP of 23,500 (IPCC, 2013). In GHG-emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of equivalent CO_2 (CO_2e). By applying the GWP ratios, project-related CO_2e emissions can be tabulated in metric tons per year. Typically, the GWP ratio corresponding to the warming potential of CO_2 over a 100-year period is used as a baseline.

Table 3.7-2 Greenhouse Gas Emissions Sources and GWP

GHG	Example Source	GWP
CO_2	Energy generation	1
CH_4	Livestock; landfill operation	28
N_2O	Transportation; crop fertilization	265
HFCs	Refrigeration and cooling	138[a]
PFCs	Semi-conductor manufacturing	8,900[b]
SF_6	Gas-insulated switchgear	23,500

Notes:

[a] GWPs of HFCs range. This value was calculated for HFC-152a.

[b] GWPs of PFCs range. This value was calculated for PFC-218.

Source: (IPCC, 2014)

Greenhouse Gas Emission Inventory

National

Anthropogenic GHG emissions in the United States are derived mostly from the combustion of fossil fuels for transportation and power production. The total national anthropogenic GHG emissions in 2015 were approximately 6,587 million metric tons of CO_2e. Energy-related CO_2 emissions resulting from fossil-fuel exploration and use account for more than three-quarters of the human-generated GHG emissions, primarily in the form of CO_2 emissions from burning fossil fuels. Twenty-nine percent of the GHG emissions were generated from electricity production, such as power plants; 27 percent from transportation; and 21 percent from industrial processes, while the remaining sources include agriculture, forestry, residential and commercial uses, and waste management (USEPA, 2017).

Statewide

Total gross estimated California GHG emissions in 2017 were 424 million metric tons of CO_2 equivalent ($MTCO_2e$), five $MMTCO_2e$ lower than 2016 levels and seven $MMTCO_2e$ below the 2020 GHG Limit established by CARB in the 2014 Scoping Plan of 431 $MMTCO_2e$ (CARB, 2019a). Table 3.7-3 shows the Statewide GHG emissions for the years 1990 and 2017 (CARB, 2019b).

Table 3.7-3 California Greenhouse Gas Inventory

Source Category	1990 (million $MTCO_2e$)	2017 (million $MTCO_2e$)
Total energy	386.41	348.9
Industrial processes and product use	18.34	33.6
Agriculture, forestry and other land use	19.11	30.7
Waste	9.42	10.8
Gross California GHG emissions	**433.29**	**424.1**

Sources: (CARB, 2007; CARB, 2017)

During the 2000 to 2017 period, per capita GHG emissions in California dropped from a 2001 peak of 14.1 tons per person to 10.7 tons per person in 2017, a 24 percent decrease. The reductions in California GHG emissions during this period are attributed to energy efficiency and conservation efforts (CARB, 2019b).

Regional

Total GHG emissions in the San Francisco Bay Area Air Basin (SFBAAB) steadily increased by 29 percent between 1990 and 2011, to a total of 86.6 $MTCO_2e$ in 2011, as shown in Table 3.7-4. Between 1990 and 2011, per capita emission rates in SFBAAB increased by approximately five percent (BAAQMD, 2015). Total emissions have increased since 1990 compared to both 2011 and 2015, but in 2015 total GHG emissions decreased approximately by two percent compared to 2011, as shown in Table 3.7-4 and Table 3.7-5.

Local

Conversely to the overall SFBAAB, emissions in Marin County have declined since 1990, starting in 2010, with a decrease in emissions of 24 percent in 2017 compared to 1990 as shown in Table 3.7-6. Per capita GHG emissions have also decreased since 1990 (Marin County, 2019).

Table 3.7-4 SFBAAB Greenhouse Gas Inventory

Source Category	1990 (million $MTCO_2e$)	2011 (million $MTCO_2e$)
Transportation	28.6	34.3
Industrial/commercial	21.0	31.0
Electricity/co-generation[a]	8.4	12.1
Residential fuel usage	7.0	6.6
Agriculture/farming	1.2	1.3
Off-road equipment	0.9	1.3
Total SFBAAB GHG emissions	**67.1**	**86.6**

[a] Includes imported electricity emissions of 2.7 million $MTCO_2e$.

Source: (BAAQMD, 2015)

Table 3.7-5 SFBAAB Greenhouse Gas Inventory (Percent)

Source Category	2015
Transportation	41%
Industrial	26%
Electricity/co-generation	14%
Residential/commercial	10%
Agriculture/farming	1%
Recycling/waste	3%
High GWP gases	4%
Total SFBAAB GHG emissions	**100% (84.7 million MTCO2e)**

Source: (BAAQMD, 2017a)

Table 3.7-6 Marin County Greenhouse Gas Inventory

Source Category	1990 ($MTCO_2e$)	2017 ($MTCO_2e$)
Transportation	193,544	157,523
Commercial energy	74,190	33,278
Residential energy	131,265	78,732
Agriculture	122,366	118,665
Off-road	19,300	17,127
Waste	14,414	17,301
Water	1,319	260
Wastewater	5,453	5,663
Total Marin County GHG Emissions	**561,851**	**428,549**

Source: (Marin County, 2019)

Urban Microclimate

Vegetation and impervious surfaces have a significant effect on localized temperature and trees, and vegetation can minimize extreme air temperature. The first mechanism by which this occurs is that tree and vegetative cover shade impervious surfaces, preventing solar radiation from absorbing into the surface and preventing heat storage. Shade can minimize the urban heat-island effect, in which an urban area is significantly warmer than the surroundings due to reflective surfaces. Urban tree-canopy cover is critical in moderating the heat-island effect, which poses a threat to human health. The second mechanism is that trees transpire water, leading to transpirative cooling (McDonald, Kroeger, Boucher, Longzhu, & Salem, 2016). Impervious surfaces, conversely, cause an increase in localized temperatures. A study of the relationship between canopy cover and impervious cover and the effect on temperature found that, as impervious surface cover increased, temperature increased linearly. However, as canopy cover increased, temperature decreased at a greater rate than linearly (Ziter, Pedersen, Kucharik, & Tumer, 2019).

3.7.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

United States Environmental Protection Agency – Clean Air Act

On April 2, 2007, the Supreme Court found in Massachusetts v. USEPA that GHGs are air pollutants under the Clean Air Act. USEPA, therefore, has the authority to regulate GHG emissions. The Supreme Court found that the Clean Air Act authorizes USEPA to regulate motor vehicle GHG emissions if USEPA determines they cause or contribute to air pollution

that may reasonably be anticipated to endanger public health or welfare (USEPA, 2017). These GHG emissions should be evaluated as part of a project's GHG emissions inventory.

State Regulations

California Air Resources Board – Global Warming Solutions Act of 2006 (Assembly Bill 32)
In September 2006, the State legislature passed, and Governor Schwarzenegger signed, AB 32 (Chapter 488, States of 2006), the Global Warming Solutions Act of 2006, which set the 2020 GHG emissions-reduction goal into law. The Global Warming Solutions Act of 2006 directed CARB to begin developing discrete early actions to reduce GHG emissions while also preparing the Climate Change Scoping Plan (Scoping Plan), which outlines a framework of measures that would eventually be adopted and implemented to reach AB 32 goals (CARB, 2017). CARB approved the Scoping Plan in 2008 and updated it in May 2014 (Scoping Plan First Update). The project is subject to the regulations and implementation measures outlined in the Scoping Plan to achieve AB 32 goals.

In September of 2016, AB 32 was extended to achieve reductions in GHG of 40 percent below 1990 levels by 2030. Adopted regulations that correspond to elements of the Scoping Plan include the 33 percent Renewable Portfolio Standard by 2020 (SB X1-2), the Cap-and-Trade Program, and the Low Carbon Fuel Standard. The updated Scoping Plan identifies actions for each sector (i.e., energy, transportation, agriculture, water, waste management) that California should take to meet its climate-change goals. Recommended actions of the Scoping Plan First Update, relevant to the Program, within CARB's purview, are generally related to Transportation and to Natural and Working Lands (CARB, 2014). The newest Scoping Plan, adopted in 2017, (2017 Scoping Plan) describes ongoing and proposed programs and policies to achieve the 2030 GHG emissions target for several sectors (i.e., energy, transportation, industry, water, waste management, and natural and working lands) (CARB, 2017).

California Air Resources Board – Sustainable Communities and Climate Protection Act of 2008 (Senate Bill 375)
Senate Bill (SB) 375, signed by Governor Schwarzenegger in September 2008, aligns regional transportation planning efforts, regional GHG emission-reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy showing prescribed land-use allocation in each MPO's Regional Transportation Plan. CARB, in consultation with the MPOs, is to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

The applicable MPO in the project areais the Metropolitan Transportation Commission (MTC). MTP, in conjunction with the Association for Bay Area Governments (ABAG), adopted Plan Bay Area in 2013, which includes the Bay Area region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan. The project is subject to the regulations and implementation measures outlined in Plan Bay Area in 2013 and 2040 Regional Transportation Plan to achieve the goals of SB 375.

Regional and Local Regulations

Metropolitan Transportation Commission and the Association for Bay Area Governments
Pursuant to SB 375, the MTC and ABAG was tasked by CARB to achieve a 10 percent per capita reduction in passenger-vehicle generated transportation emissions by 2020 and a 16 percent per capita reduction by 2035 from 2005 levels, which CARB confirmed the region would achieve by implementing its Sustainable Communities Strategy.

MTC and ABAG have worked together to craft Plan Bay Area 2040, an update to the previous plan, to identify opportunities that can help steer the region toward the set goals. Plan Bay Area 2040 was adopted in July 2017 and integrates transportation, land use, and housing to meet greenhouse gas reduction targets set by CARB (MTC, 2017).

Marin County – Marin Countywide Plan
The following goals and policies in the Marin Countywide Plan are relevant to the project's GHG emissions (Marin County , 2007).

Goal AIR-4: Minimization of Contributions to Greenhouse Gases. Prepare policies that promote efficient management and use of resources in order to minimize greenhouse gas emissions. Incorporate sea level rise and more extreme weather information into the planning process.

> ***Policy AIR-4.1: Reduce Greenhouse Gas Emissions***. Adopt practices that promote improved efficiency and energy management technologies; shift to low-carbon and renewable fuels and zero emission technologies.
>
> > *Implementing Program AIR-4.c: Reduce Methane Emissions Released from Waste Disposal.* Encourage recycling, decrease waste sent to landfills, require landfill methane recovery, and promote methane recovery for energy production from other sources. (See Goal PFS-3.)

Goal EN-3: Adopt Green Building Standards. Integrate green building requirements into the development review and building permit process.

> ***Policy EN-3.1: Initiate Green Building Initiatives***. Encourage and over time increasingly require sustainable resource use and construction with nontoxic materials.
>
> > *Implementing Program EN-3.c: Divert Construction Waste*. Continue to implement and improve the Construction and Demolition Waste Recovery Ordinance, requiring building projects to recycle or reuse a minimum of 50% of unused or leftover building materials.

Marin County – Climate Action Plan
The Marin County Unincorporated Area Climate Action Plan 2030 Update was adopted by the Board of Supervisors on December 8, 2020. The Climate Action Plan 2030 Update outlines a

path to reduce GHG emissions through the year of 2030. (Marin County , 2020). The Marin County Unincorporated Area Climate Action Plan 2030 includes two targets:

- Reduce GHG emissions from community activities in the unincorporated areas of Marin County by at least 60 percent below 2005 levels by 2030; and
- Reach net zero emissions by 2045.

The following strategies and actions are included in the 2030 Climate Action Plan that are related to GHG emission reduction.

WR-C3: Construction & Demolition Debris and Self-Haul Waste:

1. Require all loads of construction and demolition debris and self-haul waste to be processed for recovery of materials as feasible.

AG-C3: Urban Forest and Food Production and Natural Lands Management:

2. Improve ecosystem health by planting additional trees on County-owned land, including public parks, open space, medians, and rights of way.
4. Require that site planning, construction, and maintenance of new development preserve existing healthy trees and native vegetation on site to maximum extent feasible. Replace trees and vegetation not able to be saved, preferably with appropriate native species.

The 2030 Climate Action Plan includes a variety of regulatory, incentive-based, and market-based strategies that are expected to reduce GHG emissions from both existing and new development in Marin County. The GHG emissions inventory in the plan included emissions for off-road construction equipment (based on CARB's OFFROAD model)[2] that apply to construction emissions in unincorporated Marin County.

Town of Ross Climate Action Plan

The Climate Action Plan describes the efforts and actions Ross can take to reduce its greenhouse gas emissions and mitigate, to the extent feasible at the local level, the potential impacts of climate change (Town of Ross, 2010). The recommended actions include the following:

- Support the Street Tree Committee's efforts to develop and implement a community-wide tree planting program for streets and parks to significantly increase the carbon-storage potential of trees and other vegetation in the community.
- Encourage the use of fuel-efficient and low GHG-emitting vehicles and driver behaviors.

[2] See https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-road-documentation-0.

- Adopt and implement a policy requiring limitations on idling for commercial vehicles, construction vehicles, buses and other similar vehicles, beyond state law, where feasible.
- Continue to enforce policies and programs that regulate the removal and replacement of significant trees.
- To the extent possible, require new development to be planned around existing trees.
- Support the preservation and creation of conservation areas that provide carbon sequestration benefits, such as those with tree cover.

3.7.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Given the specific location and nature of the project, impacts are analyzed in this section relative to the following additional threshold:

c. Alter air movement, moisture, or temperature, or cause any change in climate.

Significance Thresholds

Due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, it is challenging to conclude that a project's increase in annual GHG emissions would cause a measurable change in global GHG emissions necessary to influence global climate change. According to CAPCOA, "GHG impacts are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective" (CAPCOA, 2008). It is global GHG emissions in their aggregate that contribute to climate change, not any single source of GHG emissions alone. The GHG emissions of a single project alone would not likely cause a direct physical change in the environment.

For land use projects with operations that are not stationary sources, the BAAQMD's CEQA Guidelines recommend use of an operational significance threshold of 1,100 metric tons CO_2e per year, and for stationary-source projects the recommended significance threshold is 10,000 metric tons CO_2e per year (BAAQMD, 2017b). This threshold was developed with consideration of the AB 32 emission- reduction goals. Therefore, even though the project is not a typical land use development project, this EIR nonetheless uses the significance threshold of 1,100 metric tons CO_2e per year to evaluate whether the project's GHG emissions could have a significant impact on the environment.

It is acknowledged that this significance threshold was developed to focus on emissions reductions by 2020, and that BAAQMD staff and CARB have not yet provided guidance or recommendations for significance thresholds to evaluate consistency with emissions reduction goals for years beyond 2020; however, the 1,100 metric tons CO_2e per year threshold can be used as a rough gauge to determine if the project would be consistent with these statewide GHG reduction goals.

The BAAQMD has not adopted a significance threshold for construction-related GHG emissions; however, it requires that the lead agency disclose those emissions and make a determination of impacts in relation to meeting AB 32 reduction goals. Construction-related GHG emissions from projects "occur over a relatively short-term period of time" and "contribute a relatively small portion of the overall lifetime project GHG emissions" (SCAQMD, 2008). In order to account for construction emissions and the fact that GHG emissions have long-lasting effects, technical guidance prepared by South Coast Air Quality Management District (SCAQMD) that has been accepted as the professional standard, recommends that construction GHG emissions should be "amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies." In accordance with this technical guidance, GHG emissions generated from construction activities have been amortized over a projected 30-year lifetime of the project.

Approach to Impact Analysis

GHG emissions resulting from project-related incremental (net) increases in the use of off-road and on-road mobile vehicles were calculated and compared to existing conditions in order to evaluate project impacts. Project GHG emission calculations include project-construction activities such as demolition, hauling, and construction-worker trips. GHG emissions are estimated using CalEEMod, as described in detail in Section 3.2 Air Quality. Detailed calculations are provided in Appendix C of this Draft EIR. The average annual emissions from operational activities and amortized construction activities are compared to the BAAQMD annual emissions threshold.

3.7.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.7-1: The project would generate greenhouse gas emissions but would have a less-than-significant impact on the environment.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Vehicle and Equipment Emissions

GHG emissions would be generated primarily during project construction activities from the use of heavy-duty off-road construction equipment and automobile and truck trips to and from the project area required to transport workers, materials, and debris.

Once constructed, the project would include maintenance activities, such as vegetation management, sediment and debris removal, and stormwater pump station and floodwall maintenance. These activities would not include ground--disturbing work. General maintenance and inspection activities would be similar to existing conditions, resulting in no new net GHG emissions. Operation of the pump station and backup generator would emit GHGs during operation of the project. Table 3.7-7 presents construction and operational emissions generated by the project. The total operational and 30-year amortized construction GHG emissions would be less than the BAAQMD operational threshold of 1,100 MT CO_2e per year, as shown in Table 3.7-7. The impact would be less than significant.

Table 3.7-7 Estimated GHG Emissions (metric tons CO_2e)

Unit	Project Element	Construction Emissions	Amortized Construction Emissions (30 years)	Operational Emissions	Total Annual Emissions
Unit 4	Fish ladder removal and Unit 4 grading	48.6	1.6	--	1.6
Unit 3	Frederick Allen Park	72.2	2.4	--	2.4
	Fish pools	100.5	3.4	--	3.4
	Floodwall (Segment #3)	20.3	0.7	--	0.7
	Stormwater pump station	25.9	0.9	17.7[a]	18.6
	Floodwall (Segment #2)	12.2	0.4	--	0.4
Unit 2	Floodwall (Segment #1)	17.2	0.6	--	0.6
	Lower College of Marin concrete channel removal	46.9	1.6	--	1.6
Total		**343.8**	**11.5**	**17.7**	**29.1**
BAAQMD significance thresholds					1,100
Threshold exceeded?					No

[a] The emission calculation conservatively assumed up to 50 hours of operation for testing the backup generator and operation of the 40 hp pumps for up to 66 days per year, based on historical days of precipitation in the Town of Ross.

Carbon Sequestration

Construction of the proposed project would involve removal of up to 369 trees from along the creek. The loss of these trees would constitute a loss of carbon sequestration and emissions of GHGs from decomposition of the chipped and cut material. The riparian habitat within Frederick Allen Park and the lower College of Marin concrete-channel-removal area would be enhanced and restored with natural vegetation. Up to 125 trees would be planted within Frederick Allen Park and more within the lower College of Marin area. A study of stream restoration in stream reaches across Marin, Napa, and Sonoma counties found that over a

45-year period, 16,217[3] metric tons of CO_2e accrued at a 1-kilometer representative stream restoration site (Lewis, 2015). In the short term, the proposed project would emit carbon from use of equipment, vehicles, and carbon losses through vegetation removal. Planting of trees and vegetation would occur as part of the proposed project. The restored creek habitat would result in increased sequestration of carbon in the long term compared to existing conditions ensuring that significant impacts on carbon sequestration would not occur. Furthermore, as analyzed in Section 3.3 Biological Resources, the District would need to implement **Mitigation Measure 3.3-2b: Tree Mitigation** for the tree removal, which requires planting of a greater number of trees than would be removed by the proposed project. In the long term, more trees would be growing in the region and sequestering carbon than under existing conditions. The impact on carbon sequestration would be beneficial over time and less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.7-2: The project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Climate Change Scoping Plan

The Climate Change Scoping Plan lays out the framework for achieving compliance with the 2030 Statewide GHG target of 40 percent below 1990 levels. The State has promulgated specific laws aimed at GHG reductions, with the goal of achieving the statewide GHG reduction targets. Table 3.7-8 contains a list of GHG-reducing strategies potentially applicable to the project. The analysis describes the consistency of the project with these strategies that support the State's strategies in the Climate Change Scoping Plan to reduce GHG emissions. As shown below, the project would be subject to State and local requirements to reduce waste generation and reduce vehicle travel consistent with statewide strategies and regulations. As a result, the project would not conflict with applicable Climate Change Scoping Plan strategies and regulations to reduce GHG emissions.

Furthermore, in addition to the project's consistency with applicable GHG-reduction strategies, the project would not conflict with the future anticipated statewide GHG-reductions goals. CARB has outlined a number of potential strategies for achieving the 2030 reduction target of 40 percent below 1990 levels. These potential strategies include renewable resources for half of the State's electricity by 2030, increasing the fuel economy of vehicles and the number of zero -emission or hybrid vehicles, and reducing the rate of growth in vehicle miles traveled. The project would benefit from statewide and utility-provider efforts towards increasing the portion

[3] Value is accounting only for carbon accrual, soil and vegetation nitrogen account for additional accrual above baseline conditions.

Table 3.7-8 Consistency with Applicable State Greenhouse Gas Reduction Strategies

Strategy	Description	Discussion
	Energy	
California Renewables Portfolio Standard and SB 350	Increases the proportion of electricity from renewable sources to 33 percent renewable power by 2020.	**Consistent.** During operations, the pumps would use electricity provided by PG&E, which has already achieved 33 percent renewables as of 2017 (CPUC, 2019) and is required to meet the 2050 performance standard.
	Mobile Sources	
Pavley Regulations (AB 1493)	Reduces GHG emissions in new passenger vehicles from model year 2012 through 2016 (Phase I) and model years 2017–2025 (Phase II). Also reduces gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020.	**Consistent.** Worker and other light-duty vehicles used during construction are required to comply with these regulations. No conflict would occur.
Low Carbon Fuel Standard (Executive Order S-01-07)	Establishes protocols for measuring life-cycle carbon intensity of transportation fuels and helps to establish use of alternative fuels.	**Consistent.** The project would be consistent with this regulation and would not conflict with implementation of the transportation fuel standards.
Advanced Clean Cars Program	In 2012, CARB adopted the Advanced Clean Cars (ACC) program to reduce criteria pollutants and GHG emissions for model year vehicles 2015 through 2025. ACC includes the Low-Emission Vehicle (LEV) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle (ZEV) regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years.	**Consistent.** The standards would apply to all vehicles used by construction workers and maintenance workers associated with the project. No conflict would occur.
	Solid Waste	
California Integrated Waste Management Act (IWMA) of 1989 and AB 341	The IWMA mandated that state agencies develop and implement an integrated waste-management plan that outlines the steps to be taken to divert at least 50 percent of their solid waste from disposal facilities. AB 341 directs CalRecycle to develop and adopt regulations for mandatory commercial recycling and sets a statewide goal for 75 percent disposal reduction by the year 2020.	**Consistent.** The demolition debris and soil, including the concrete, is anticipated to be recycled at the Marin Resource Recovery Center. Construction materials would be disposed of appropriately to meet recycling requirements. The project would comply with this regulation.

of electricity provided from renewable resources. The project would also benefit from statewide efforts towards increasing the fuel economy standards of vehicles. While CARB is in the process of developing a framework for the 2030 reduction target in the Scoping Plan, the project would support or not impede implementation of these reduction strategies identified by CARB.

2017 Clean Air Plan

As discussed in Section 3.2 Air Quality, one of the goals of BAAQMD's 2017 CAP is to protect the climate by reducing GHG emissions. No additional control measures beyond those discussed in Section 3.2 Air Quality apply to the project. Although GHG emissions generated by project activities would increase compared to existing conditions, as shown in Table 3.7-7, the project would not conflict with the 2017 CAP goal to achieve the State's GHG-reduction targets because GHG emissions would not exceed the BAAQMD significance threshold for GHGs. The project would comply with the BAAQMD GHG threshold identified to achieve the goals of the 2017 CAP.

Local GHG Reduction Plans and Policies

Marin County and Town of Ross have adopted climate action plans to reduce GHG emissions and meet the State's AB 32 goals. The Marin County Countywide Plan and Climate Action Plan include a number of actions to direct construction and demolition debris to a certified facility for recycling, maintain healthy ecosystems, and replace removed tress with native species. Table 3.7-9 contains a list of GHG-reducing policies, actions, or programs potentially applicable to the project. The analysis describes the consistency of the project with these policies, actions, and programs that support Marin County and the Town of Ross's regulations to reduce GHG-emissions.

Table 3.7-9 Consistency with Applicable Local Greenhouse Gas Reduction Policies, Actions, and Programs

Local Regulation	Policy/Action/Program	Discussion
Natural System		
Marin County Climate Action Plan Urban Forest and Food Production and Natural Lands Management Actions	Improve ecosystem health by planting additional trees on County-owned land, require siting planning, construction, and maintenance of new development, preserve existing healthy trees, and replace removed trees with native species.	**Consistent.** As part of the project, replacement trees and vegetation would be planted in the project area. The project would be required to plant more trees than those removed (as analyzed in Section 3.3 Biological Resources, Mitigation Measure 3.3-2b), ultimately increasing carbon sequestration in Marin County. No conflict would occur.
Town of Ross's Climate Action Plan recommended action for Natural Systems, Sequestration and Carbon Offsets	Support the Street Tree Committee's efforts to develop and implement a community-wide tree-planting program for streets and parks to significantly increase the carbon-storage potential of trees and other vegetation in the community.	

Local Regulation	Policy/Action/Program	Discussion
Mobile Sources		
Town of Ross's Climate Action Plan recommended actions for Land Use and Transportation	Encourage the use of fuel-efficient and low GHG-emitting vehicles and driver behaviors. Adopt and implement a policy requiring limitations on idling for commercial vehicles, construction vehicles, buses, and other similar vehicles beyond state law, where feasible.	**Consistent.** The project would use vehicles that are in compliance with the Pavley Regulations and the ACC program adopted by the CARB to reduce criteria pollutant and GHG emissions. Construction activities would comply with Section 2485 of the California Code of Regulations and Mitigation Measure 3.2-2 that requires limitations on idling of equipment and vehicles. No conflict would occur.
Solid Waste		
Marin County Climate Action Plan Waste Reduction Actions	Require all loads of construction and demolition debris and self-haul waste to be processed for recovery of materials as feasible.	**Consistent.** The District is anticipated to make use of the existing construction and demolition recycling infrastructure in the county by recycling the demolition debris and soil, including the concrete, at the Marin Resource Recovery Center. All other construction and demolition debris will be hauled to a certified facility for recycling. No conflict would occur.
Marin Countywide Plan Implementing Programs for Waste Disposal	Reduce methane emissions released from waste disposal, and divert construction waste	

Conclusion

In summary, the project is consistent with applicable regulatory plans and policies to reduce GHG emissions. The project would comply with strategies outlined in Table 3.7-8) and the 2017 Clean Air Plan. The project would be consistent with the goals and policies of the general plans and climate action plans of Marin County and Town of Ross. The impact would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.7-3: The project would not significantly alter air movement, moisture, or temperature, or cause any change in climate.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

The project would involve substantial changes to the Corte Madera Creek channel and banks, with the intent of reducing flood risk as well as improving fish passage, natural creek processes, and fish and riparian habitat. The project involves removal of up to 369 trees along the creek channel for construction of a riparian floodplain and installation of floodwalls to provide flood

protection as well as removal of an existing concrete channel. The creek channel would be revegetated. These types of changes would result in short- and long-term alteration to the microclimate in the project area. In the short term, the removal of existing trees and vegetation is anticipated to result in an increase in localized temperatures due to the relationship between decreased canopy cover and increased temperatures (Ziter, Pedersen, Kucharik, & Tumer, 2019). However, a large segment of concrete channel would be removed, reducing the impervious surfaces in the area, reductions of which have been found to correlate to reduced temperatures. Additionally, as part of the project, new trees and vegetation would be planted on the project site, which would take approximately 10 years to grow to a size that would result in shading of the realigned concrete multi-use pathway. Although fewer trees may be planted than currently occur in the area under existing conditions, the reduction in concrete and replacement with vegetation would ensure that temperatures in the project area do not increase over the long term. The impact would be less than significant.

Mitigation: None required.

3.7.7 References

Anderegg, W. R., Prall, J. W., Harold, J., & Schneider, S. H. (2010). Expert Credibility in Climate. *Proceedings of the National Academy of Sciences of the United States of America*, 107:12107-12109.

BAAQMD. (2015, January). Bay Area Emissions Inventory Summary Report: Greenhouse Gases Base Year 2011.

BAAQMD. (2017a, March). Greenhouse Gas Emissions Estimates and Draft Forecasts. *Update and Work in Progress*.

BAAQMD. (2017b, May). *California Environmental Quality Act Air Quality Guidelines.* Retrieved from https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

CAPCOA. (2008, January). *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.* Retrieved from http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA-White-Paper.pdf

CARB. (2007, November 19). *California Greenhouse Gas Inventory for 1990-2004 – by IPCC Category*. Retrieved January 22, 2020, from https://ww3.arb.ca.gov/cc/inventory/archive/tables/ghg_inventory_ipcc_90_04_sum_2007-11-19.pdf

CARB. (2008, December). *Climate Change Scoping Plan: A Framework for Change*.

CARB. (2014, May). *First Update to the Climate Change Scoping Plan: Building on the Framework Pursuant to AB 32*. Retrieved January 21, 2020, from

http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf

CARB. (2017, November). California's 2017 Climate Change Scoping Plan.

CARB. (2019a). *California Greenhouse Gas Emissions for 2000 to 2017: Trends of Emissions and Other Indicators.*

CARB. (2019b, August 12). *California Greenhouse Gas Inventory for 2000-2017 — by IPCC Category*. Retrieved January 22, 2020, from https://ww3.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_ipcc_sum_2000-17.pdf

CPUC. (2019, November). 2019 California Renewables Portfolio Standard Annual Report .

Energy + Environmental Economics . (2015, April 6). *Summary of the California State Agencies' PATHWAYS Project: Long-Term Greenhouse Gas Reduction Scenarios* . Retrieved from https://ww3.arb.ca.gov/html/fact_sheets/e3_2030scenarios.pdf

IPCC. (2007). Climate Change 2007: The Physical Science Basis. *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*.

IPCC. (2013). Climate Change 2013 The Physical Science Basis. *Working Group I Contribution to the Fifth Assessment Report of IPCC*.

IPCC. (2014). Climate Change 2014 Synthesis Report Summary for Policymakers. *Fifth Assessment Report of the Intergovernmental Panel on Climate Change*.

Lewis, D. M. (2015). *Creek Carbon Mitigating Greenhouse Gas Emissions through Riparian Revegetation.* University of California Cooperative Extension in Marin County.

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County . (2020, December). Climate Action Plan 2030.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

~~Marin County. (2015, July). Climate Action Plan. *2015 Update*.~~

Marin County. (2019, September). Interim Community Greenhouse Gas Emissions Assessment.

McDonald, R., Kroeger, T., Boucher, T., Longzhu, W., & Salem, R. (2016). *Planting Health Air: A global analysis of the role of urban trees in addressing particulate matter pollution and extreme heat.* The Nature Conservancy.

MTC. (2017, July). Plan Bay Area 2040.

SCAQMD. (2008, December 5). *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans.* Retrieved from https://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=2

Town of Ross. (2010, November). *Climate Action Plan*. Retrieved from https://www.townofross.org/sites/default/files/fileattachments/planning/page/242/ross_climate_action_plan.pdf

USEPA. (2011, September). *Accounting Framework for Biogenic CO2 Emissions from Stationary Sources*.

USEPA. (2016, August). *What Climate Change Means for California*.

USEPA. (2017, July 11). *Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Section 202(a) of the Clean Air Act*. Retrieved January 22, 2020, from https://www.epa.gov/ghgemissions/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a-clean

Ziter, C. D., Pedersen, E. J., Kucharik, C. J., & Tumer, M. G. (2019). Scale-dependent interactions between tree canopy cover and impervious surfaces reduce daytime urban heat during summer. *Proceedings of the National Academy of Sciences of the United States of America*, 757-7580.

3.8 Hazards and Hazardous Materials

3.8.1 Introduction

This section evaluates the potential for the project to result in adverse impacts related to hazards and hazardous materials. The analysis is based on review of available reports and maps of the project area and vicinity and on a discussion of potential project impacts and appropriate mitigation measures, as necessary.

3.8.2 Scoping Comments

Comments related to hazards and hazardous materials impacts were received during the public scoping process. These comments and the location where they are addressed in the hazards and hazardous materials analysis are provided in Table 3.8-1.

Table 3.8-1 Hazards and Hazardous Materials Scoping Comments

Agency/Entity	Comment	Location in Hazards and Hazardous Materials Section that Comment is Addressed
Town of Ross	Mechanisms and procedures to keep the public safe during high water events.	Section 3.8.7, Impact 3.8-4
Garril Page	The proposed side path, and steps to the creek invite access by the public. This creates dangerous conditions for unsuspecting people unaware that flows in the project area are forceful enough to transport an 18-inch boulder past the College of Marin into the downstream, natural channel. The unwary are not afraid of the creek: a Kentfield resident drowned in the channel. During flood conditions, small watercraft and surfboards are in use along Berens Drive and at the Bon Air Center.	Section 3.8.7, Impact 3.8-4
Garril Page	Where there are new flood walls, potential to trap people behind those walls with flood waters. Liability potentially increased by people being close to the creek.	Section 3.8.7, Impact 3.8-4
Barbara Salzman	This is a great project, and I think getting rid of the concrete wall would be an incredible benefit. Surprised about steps down to the creek. Do not like the idea of creek access. Not clear where that will be. Increases county liability and it isn't good for the resources.	Section 3.8.7, Impact 3.8-4
Elizabeth Robbins	Safety is a big problem with this project. Don't want people going into the creek during a storm. Dangerous creek when there is a lot of rain. Concerned about steps down to creek and not fencing off water. Puts people up close to rapidly flowing water.	Section 3.8.7, Impact 3.8-4
Pam	Hopes that the project will not remove fences at the back of the property in cement area so that people do not get pulled in during a flood. If someone falls in they will be dead – too fast moving and rapid water.	Section 3.8.7, Impact 3.8-4

3.8.3 Definitions

Hazardous Materials

Hazardous materials are chemical and non-chemical substances that can pose a threat to the environment or human health if misused or released. Explosives, flammable and combustible substances, poisons, radioactive materials, pesticides, petroleum products, and other materials under the Resource Conservation and Recovery Act (RCRA) in 40 Code of Federal Regulations (CFR) 261 are considered hazardous materials. These substances are most often released during motor vehicle or equipment accidents or chemical accidents during industrial use. Hazardous substances have the potential to leach into soils, surface water, and groundwater if they are not properly contained.

Wildland Fire

A wildland fire is any non-structure fire that occurs in vegetation or natural fuels. Wildland fires include prescribed burns and wildfires. Wildfire is defined as a wildland fire originating from an unplanned ignition, such as lightning, volcanos, unauthorized and accidental human-caused fires, and prescribed fires that are declared wildfires (National Wildfire Coordinating Group, 2018). A fire can burn exclusively along the forest floor, climb and consume the tree crown of an individual tree, or reach into and spread through the tree canopy.

Biotic and abiotic factors influence fires. Biotic factors that influence flammability of a forest include moisture content in the foliage; size and shape of leaves; retention of dead leaves and branches; spatial arrangement of flammable vegetation; and presence of flammable oils, resins, or other chemicals in leaves or branches. Shrubs and vines can act as fuel ladders, allowing a surface wildfire to travel up into the tree canopy. Dense forests with minimal horizontal separation between trees can spread flames more quickly (Doran, Randall, & Long, 2004).

Abiotic factors include climate (dry or humid), winds, weather conditions, and topography. Fire spreads more quickly during high-wind events and can also create their own wind patterns if they grow large enough. Fires in California are more likely to occur on hot, dry days most often in the summer or fall during periods of low precipitation. Slope, aspect, elevation, forest density, and large topographic features such as rock outcroppings influence fire spread; for example, fires tend to spread faster up a slope than down a slope.

3.8.4 Environmental Setting

Hazardous Materials and Sites

The presence of suspected contamination in and near the project area was identified using the SWRCB GeoTracker and the Department of Toxic Substances Control's (DTSC) EnvriroStor

database. Four sites were identified within 0.25 mile[1] of the project area in the database search (Table 3.8-2). All sites require no further action and are now closed.

Table 3.8-2 Hazardous Sites Within 0.25 Mile of Project Area

Site Name and Address	Approximate Distance and Direction from Project Area	Affected Medium	Site Type	Status
College of Marin – former gas station College Avenue and Sir Francis Drake Boulevard, Kentfield, CA 94904	900 feet northeast of the intersection of Units 2 and 3	Soil	EPA LUST cleanup site	Closed
College of Marin Kentfield Campus 835 College Avenue, Kentfield, CA 94904	870 feet west of the low channel concrete	Soil	EPA LUST cleanup site	Closed
PG&E Former Substation – Kentfield 925-929 Sir Francis Drake Boulevard, Kentfield	200 feet north of Unit 2	Soil	EPA cleanup program site	Closed
United Moving Inc 1023 Magnolia Avenue, Larkspur	900 feet southwest of Unit 2	Soil	EPA LUST cleanup site	Closed

LUST = Leaking Underground Storage Tank

Sources: (DTSC, 2020; SWRCB, 2020)

Schools

Schools located within 0.25 mile of the project area include the following:

- College of Marin, adjacent to Units 2 and 3
- Kent Middle School, adjacent to Unit 2
- Ross Elementary, west of Unit 4

Airports

The closest airports to the project area are Marin Ranch and San Rafael Airports, both located approximately 4 miles northeast of the project area.

[1] Analysis under CEQA requires assessment of whether a project would be located on a hazardous materials site, as defined under Gov. Code section 65962.5. A 0.25-mile buffer is a typical distance to use to identify the presence of contaminants in off-site groundwater that may have the potential to migrate to a given site. Off-site properties with groundwater contamination greater than 0.25 mile away are assessed to not have the potential to impact a given site. Off-site properties with soil contamination generally are only are dismissed from further consideration because soil contamination remains in place.

Emergency Response and Evacuation Plans

Marin County

Marin County maintains an Emergency Operations Plan that is intended to provide adequate preparation and agency response to natural or human-caused disasters that threaten the health or property of residents and businesses (Marin County , 2007). The plan describes how emergency management will be coordinated; identifies personnel responsibilities and actions necessary to protect health and safety, property, and the environment; and details procedures before, during, and after a major event.

Town of Ross

The Town of Ross Emergency Operations Plan addresses the planned response to extraordinary emergency situations associated with disaster affecting Ross. The plan establishes the emergency-management organization required to mitigate any significant emergency or disaster affecting Ross and the overall operational concepts associated with the Town of Ross Emergency Operations Center activities and recovery process (Town of Ross, 2013).

Wildfire

Wildland fires tend to be most common and severe during years of drought and occur on days of strong winds. With extensive urbanization of wildlands, these fires often involve destruction of suburban homes located in the wildland–urban intermix. The Town of Ross and Kentfield are listed as wildland–urban interface communities but are not within the very high fire hazard severity zones (VHFHSZ) (FIRESafe MARIN, 2020; CAL FIRE, 2008). Within the project area, Unit 4 represents the greatest risk of fire due to its dense vegetation and topography; however, no fires have occurred within Unit 4 in recent years (USACE, 2018).

3.8.5 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

Resource Conservation and Recovery Act of 1976, Toxic Substances Control Act of 1976, and Hazardous and Solid Waste Act of 1984

Implementation of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Toxic Substances Control Act (TSCA) of 1976 resulted in the creation of a major federal hazardous-waste regulatory program that is administered by the United States Environmental Protection Agency (USEPA). The USEPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. Under the RCRA, a waste may be considered hazardous if it exhibits certain hazardous characteristics (ignitability, corrosivity, reactivity, or toxicity) or if it is included on a specific list of wastes that the USEPA has determined are hazardous. In accordance with the RCRA, any generator, transporter, or facility that treats, stores, or disposes of hazardous waste is required to ensure that the waste is properly managed from "cradle to grave" by complying with the federal waste-manifest system and other

regulations regarding hazardous waste identification, classification, generation, management and disposal.[2]

U.S. Department of Transportation Hazardous Materials Transport Act of 1974

The U.S. Department of Transportation (USDOT), in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 directs the U.S. Department of Transportation to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. CFR 49, 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials.

Occupational Safety and Health Act of 1970

The Occupational Safety and Health Act (OSHA) was passed to address employee safety in the workplace. The act created the Occupational Safety and Health Administration (OSHA), whose mission is to ensure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. The OSHA staff establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs. Some OSHA regulations contain standards related to hazardous materials handling, including workplace conditions, employee protections requirements, first aid, and fire protection. The regulations in 29 CFR et seq. include the following:

1. Part 1910.38 requires facilities to have an emergency action plan to ensure the safe response to emergencies.
2. Part 1910.119 contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals that may result in toxic, fire, or explosion hazards.
3. Part 1910.1200 ensures that the hazards of all chemicals produced or imported are classified and that information concerning the classified hazards is transmitted to employers and employees. The transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, safety data sheets, and employee training.

State Regulations

Hazardous Materials Release Response Plans and Inventory Act

The Hazardous Materials Release Response Plans and Inventory Act of 1985, codified in Health and Safety Code, Sections 25500 et seq., also known as the Business Plan Act, requires

[2] Code of Federal Regulations, Title 40 – Protection of Environment, Parts 260-273.

businesses using hazardous materials of greater than 55 gallons of a liquid, 200 cubic feet of a gas, or 500 pounds of a solid to prepare a Hazardous Materials Business Plan (HMBP) that describes their facilities, inventories, emergency response plans, and training programs. HMBPs contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of. This code and the related regulations in Title 19, California Code of Regulations (CCR), Sections 2620 et seq., require local governments to regulate local-business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit a HMBP to their local Certified Unified Program Agency (CUPA) (see more below under the Unified Program) and to report releases to their CUPA and the State Office of Emergency Services. The California Office of Emergency Services is responsible for implementing the accident prevention and emergency response programs established under the Act and implementing regulations.

Hazardous Waste Control Act

The Hazardous Waste Control Act of 1972, codified in Health and Safety Code Sections 25100 et seq., created the State hazardous-waste management program, which is similar to but more stringent than the federal RCRA program. The Act is implemented by regulations contained in CCR Title 26, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling treatment, storage and disposal facilities; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with DTSC.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program), codified in Health and Safety Code Sections 25404 et seq., requires the administrative consolidation of six hazardous materials and waste programs under one agency, a CUPA. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. The Marin County Department of Public Works is the CUPA for all of Marin County, including the Town of Ross and unincorporated Kentfield. Most of the previously described regulations are under the jurisdiction of the Marin County CUPA.

California Occupational Safety and Health Act

The California Occupational Safety and Health Act of 1973, codified in the California Labor Code, Sections 6300 et seq., addresses California employee working conditions, enables the enforcement of workplace standards, and provides for advancements in the field of occupational health and safety. The act also created the California Occupational Safety and Health Administration (Cal/OSHA), the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal/OSHA's standards are generally more

stringent than federal regulations. Under Cal/OSHA standards, the employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (Title 8, CCR, Sections 337– 340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

Regional and Local Regulations

Marin County Municipal Code
Marin County Municipal Code establishes the following requirements related to hazardous materials that are applicable to the project.

Chapter 23.18, Stormwater Runoff Pollution Prevention (County of Marin Stormwater Runoff Pollution Prevention Ordinance)

> **Section 23.18.055 – Coordination with hazardous materials inventory and response program.** The first revision of the business plan for any facility subject to County Code Chapter 7.90 (Hazardous Materials Release Response Plans and Inventories) shall include a program for compliance with this chapter, including the prohibitions on illicit discharges, and the requirement to reduce stormwater pollutants to the maximum extent practicable.
>
> **Section 23.18.060 – Discharge of pollutants.** The discharge of material other than stormwater to a county storm drain or to an ASBS is prohibited. All discharges of material other than stormwater must be in compliance with a NPDES permit issued for the discharge.

Marin Countywide Plan
The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007).

Public Safety
Goal PS-4: Decreased Exposure to Hazardous Materials. Reduce the risks to human and environmental health from hazardous materials.

> ***Policy PS-4.1: Regulate and Reduce Hazardous Material Use.*** Control the use and storage of hazardous materials to minimize their presence in, and potential dangers to, the community and environment.
>
> > *Implementing Program PS-4.b: Regulate Hazardous Material Use*. Identify businesses that use, store, dispose of, or transport hazardous materials, and require them to follow measures that protect public health and safety.

Town of Ross General Plan

The following policies of the Ross General Plan related to hazards and hazardous materials are applicable to the project (Town of Ross, 2007).

Goal 5. Protecting Community Health and Safety and Preparing for Emergencies.

> **5.11 Hazardous Materials Storage and Disposal.** Require the proper use, storage, and disposal of hazardous materials to prevent leakage, contamination, potential explosions, fires or the escape of harmful gases, and to prevent individually innocuous materials from combining to form hazardous substances, especially at the time of disposal.
>
> **5.12 Access for Emergency Vehicles**. New construction shall be denied unless designed to provide adequate access for emergency vehicles, particularly firefighting equipment.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related to hazards and hazardous materials are applicable to the project (Town of Ross, 2020).

Chapter 18.41 Design Review

> **18.41.100 Design Review Criteria and Standards.** (k) Health and Safety. Project design should minimize the potential for loss of life, injury or damage to property due to natural and other hazards. New construction must, at a minimum, adhere to the fire safety standards in the Building and Fire Code and use measures such as fire-preventive site design, landscaping and building materials, and fire-suppression techniques and resources. Development on hillside areas should adhere to the wildland urban interface building standards in Chapter 7A of the California Building Code. New development in areas of geologic hazard must not be endangered by nor contribute to hazardous conditions on the site or on adjoining properties.

3.8.6 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it would:

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area;
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Given the specific location and design of the project, impacts are analyzed in this section relative to the following additional threshold:

h. Create any health hazard or potential health hazard, expose people to existing sources of potential health hazards, or result in unsafe conditions for employees, visitors, or students.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to hazards and hazardous materials for the project. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.8.7 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (d):** As discussed in the Environmental Setting above, four hazardous materials sites are located within 0.25 mile of the project area. All sites have been cleaned up and determined to be closed. There are no other known hazardous, toxic, or radioactive waste sites or activities within or near the project area. As a result, the project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would not create a significant hazard to the public or the environment.
2. **Criterion (e):** There are no airports or airstrips within 2 miles of the project area. Therefore, there would be no impacts related to proximity to airports.
3. **Criterion (g):** The project area is located within wildland–urban interface communities but is not within the very high fire-hazard severity zones (refer to Section 3.16 for discussion related to wildfire). The project is located within the creek corridor in areas that are routinely flooded. The purpose of the project is to

reduce the frequency and severity of flooding and to protect human life and properties in the communities of Ross and Kentfield. The project would not increase fire hazards to the surrounding areas. Therefore, there would be no impact related to increased risk of wildland fires.

Impacts Analyzed

Impact 3.8-1: The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment, including, but not limited to oils, pesticides, chemicals, or radiation.	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

Project construction activities would involve the use of heavy equipment and vehicles. Petroleum products, such as gasoline, diesel fuel, oil, lubricants, and cleaning solvents would be used to fuel and maintain construction vehicles and equipment for construction of all project elements. Minor maintenance activities and refueling of equipment and vehicles from fuel trucks could occur at the staging areas during construction. If not properly managed, the routine transport, use, and disposal of hazardous materials could pose a threat to human health or the environment. For example, hazardous materials have the potential to be spilled accidentally during maintenance, refueling, or servicing of equipment and vehicles.

Construction activities are required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies, and to respond to accidental spills, if any. Workers handling hazardous materials are required to adhere to OSHA and Cal/OSHA health and safety requirements. Hazardous materials must be transported to and from the project area in accordance with RCRA and USDOT regulations, managed in accordance with the Marin County Department of Public Works CUPA program, and disposed of in accordance with RCRA at a facility that is permitted to accept that waste. Although a spill or leak of hazardous materials is unlikely, because of the project's location in Corte Madera Creek, a spill or leak has the potential to contaminate the waterway. As discussed in Section 3.9 Hydrology and Water Quality, construction contractors would be required to prepare a SWPPP for construction activities according to the NPDES General Construction Permit requirements and similar related County and Town regulations. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction and demolition and describe spill response and control measures, equipment inspections, equipment storage, and protocols for responding immediately to spills. With implementation of the SWPPP and compliance with existing regulations, the potential impact related to routine transport and accidental releases of hazardous materials would be less than significant.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator. These activities would require occasional site visits using vehicles and construction equipment that would use fuel and oil. Similar to the use of equipment during construction activities described above, the contractor and the District would be required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies, and to respond to accidental spills, if any. With compliance with existing regulations, the potential impact would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.8-2: The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

Emissions

Project construction equipment emissions would emit toxic air contaminants (TACs) within 0.25 mile of three schools. Refer to Section 3.2 Air Quality for an analysis of TAC emissions generated during construction and potential impacts on sensitive receptors, including schools.

Materials Handling

As discussed in Impact 3.8-1, project construction would involve the routine use of petroleum products, such as gasoline, diesel fuel, oil, lubricants, and cleaning solvents to fuel and maintain construction vehicles and equipment. Equipment and vehicle maintenance and refueling, as well as use of hazardous materials, could occur within 0.25 mile of a school. With the exception of equipment fuel, which would likely be stored in a large-capacity fuel truck, the quantities of hazardous materials that could be spilled would be small. This would limit their ability to be transported to a school site because small quantities would be quickly absorbed into the soil and would cease to have an effect. In addition, workers handling hazardous materials are required to adhere to OSHA and Cal/OSHA health and safety requirements. Hazardous materials must be transported to and from the project area in accordance with RCRA and USDOT regulations limiting potential risk of exposure during transport. The impact from materials handling within 0.25 mile of a school would be less than significant.

Waste Handling

All waste would be disposed of in accordance with all applicable federal, state, and local laws regarding soil and hazardous waste disposal and would be transported off site to a licensed landfill. No contaminated soils are known to occur in the area; therefore, the project would not expose schools to any contaminated soils and the impact would be less than significant.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator. These activities would require occasional site visits using vehicles and construction equipment that would use fuel and oil. The construction contractor(s) and the District would be required to comply with numerous hazardous materials regulations designed to reduce the potential for a release of hazardous material that would affect schools and to respond to accidental spills, if any. Through compliance with existing regulations, the potential impact from exposure of schools to hazardous materials would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.8-3: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

Marin County maintains an Emergency Operations Plan that provides information for emergency management, personnel responsibilities, and procedure before, during, and after major event. The Ross Emergency Operations Plan serves as a planning reference and as a basis for effective response to any hazard that threatens Town of Ross. No roads in the project vicinity have been designated as emergency evacuation routes. Sir Francis Drake Boulevard would provide the main access from Highway 101 to all of the project work sites. Sir Francis Drake Boulevard is a main emergency or evacuation route for communities in West Marin (Marin County , 2019). No road closures would occur during construction, except for the temporary closure of one lane on College Avenue for up to two days and temporary closure of a segment at the end of Laurel Avenue. Vehicles would be able to travel on College Avenue during the short-term closure of College Avenue and would be able to travel around the work area at the end of Laurel Avenue to access the College of Marin or evacuate from the College of Marin. The project would not affect implementation of an emergency operation plan, emergency response plan, or an emergency evacuation plan for Marin County or the Town of Ross. The impact would be less than significant. Impacts on emergency access are analyzed further in Section 3.13 Transportation and Circulation, under Impact 3.13-4.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator for up to 50 hours per year. Upon completion of construction activities, occasional maintenance vehicles would access the project area. However, the vehicles would be parked off of streets, and no lane closures would be required. The project would not impair implementation of or physically interfere with any adopted emergency response plan or emergency evacuation plan. No impacts would occur.

Mitigation: None required.

	Significance Determination
Impact 3.8-4: The project would not create any health hazard or potential health hazard, expose people to existing sources of potential health hazards, or result in unsafe conditions for employees, visitors, or students.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction, Operation, and Maintenance

The project would involve park improvements within Frederick Allen Park, including construction of a new pedestrian path and tree planting adjacent to the path to shade the realigned pathway. The pathway would gently lower in grade along this newly realigned length from the tennis courts to the park entrance. From the low point in the pathway, boulders would provide areas for seating and access to the natural creek channel. The new access to the natural creek could potentially create a hazard by bringing people into greater contact with the creek, especially during rain events. The lower elevation of the pathway and location of the pathway within the floodwall would also result in increased risk of floodwaters occurring on the pathway as compared with existing conditions. The project would also remove the chain-link fencing along with the floodwalls from the edge of the park and residential yards opposite the park. Removal of the fencing, which acts as a physical barrier separating people from the creek, could expose people or structures to a significant risk of loss, injury, or death from flooding. The threat of flooding is an existing problem in the project area. Removal of chain-link fencing and relocation of the floodwall to the outside of the public access area within the park, lowering of the bike path, and creating a new access point to the creek could potentially expose people to increased risk and hazards and unsafe conditions from flooding in the project area.

The District has proposed the following measures and procedures to reduce the risk of public hazards from flooding in Frederick Allen Park:

- A spit-rail fence will be added along the length of the new top of the channel in Frederick Allen Park during the vegetation establishment period. The split rail fence will create a physical barrier between the new realigned Bike Route 20 pathway and the creek and could remain following the vegetation establishment period if desired by the Town of Ross.
- The District would close access from the pathway to the natural creek prior to predicted major storm events to prevent people entering the creek.
- Signs would be posted at the access points to Frederick Allen Park, notifying the public about the risk of flooding.

In addition, the Town of Ross Public Works Department currently implements procedures in the area to prevent access to public areas immediately prior to and during flooding. These procedures include posting A-frame signs to notify the public that the area is closed due to flooding. The Town of Ross Public Works Department would close access along Bike Route 20 through the park at the entrance from the Post Office parking lot, the entrance from Ross Common, and the entrance near the tennis courts. Through installation of fencing, blocking access to the creek prior to flooding, blocking access to Frederick Allen Park prior to flooding,

and public education about flood hazards, the project would not create a substantial hazard or substantially expose employees, visitor, or students to unsafe conditions. The impact would be less than significant.

Mitigation: None required.

3.8.8 References

CAL FIRE. (2008, October 16). Marin County Very High Fire Hazard Severity Zones in LRA As Recommended By CAL FIRE.

Doran, J. D., Randall, C. K., & Long, A. J. (2004). Fire in the Wildland-Urban Interface: Selecting and Maintaining Firewise Plants for Landscaping .

DTSC. (2010, January). Universal Waste Fact Sheet.

DTSC. (2020). *EnviroStor Database*. Retrieved July 8, 2020, from https://www.envirostor.dtsc.ca.gov/public/map/?global_id=60001614

FIRESafe MARIN. (2020, July 6). *WUI - Wildland Urban Interface*. Retrieved from https://www.firesafemarin.org/wui

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Marin County . (2019, April 18). Wildfire Preparedness A New Approach .

National Wildfire Coordinating Group. (2018, April). Glossary of Wildland Fire.

SWRCB. (2020). *GeoTracker*. Retrieved from https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=marin+county

Town of Ross. (2007, June). Town of Ross General Plan.

Town of Ross. (2013). Ross Emergency Operations Plan .

USACE. (2018, October). Draft Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) of the Corte Madera Creek Flood Risk Management Project.

3.9 Hydrology and Water Quality

3.9.1 Introduction

This section describes existing hydrology and water quality in the project area, including wastewater and stormwater management, existing and future flooding, groundwater conditions, and the existing regulatory framework governing these topics. Potential hydrology and water quality impacts that could result from construction and operation of the project and mitigation measures to avoid or reduce significant adverse impacts are then discussed, as appropriate.

3.9.2 Scoping Comments

Comments related to hydrology and water quality impacts were received during the public scoping process. These comments and the location where they are addressed in the hydrology and water quality analysis are provided in Table 3.9-1.

Table 3.9-1 Hydrology and Water Quality Scoping Comments

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
Leslie and J. Bradley O'Connell	Removal of the concrete channel in Ross, which has functioned well, will expose some homes on Sir Francis Drake to the prospect of greater flooding. Will the County or Town of Ross be responsible for these damages? The County's model as to the reduction in flooding does nothing to address the flooding caused by overland or runoff water. It is acknowledged as a problem in the previous EIR draft, but no specific approaches were suggested. The FAP flood wall design has not taken into account the possible introduction of increased flooding caused by overland water or creek overflow water trapped behind the walls. Project would introduce the possibility of greater harm during floods, greater harm to fish and trees, and greater risk throughout the year for families and homes becoming more vulnerable to flooding.	Impact 3.9-5
Garril Page	The project team has not performed an interior drainage analysis to determine if there is need.	Impact 3.9-5
Garril Page	The Oct 2018 EIR/IS predicted increased flooding downstream of Ross and specifically in the College of Marin area. By removing the channel walls in the lower Unit 2 channel, approximately the areas extending from Stations 332+00 to 320+00, increases the potential for toxic waste entering the natural creek habitat. The College of Marin's dumping facility, a.k.a. trash transfer station, has	Impact 3.9-1 Impact 3.9-3 Impact 3.9-5

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
	been a source of protest and concern. The facility is wrapped within the channel's curve. Lowering walls, and widening banks destabilizes existing conditions and increases potential encroachment of flood waters into this COM facility.	
Garril Page	The cumulative effect of removing San Anselmo's Azalea, Madrone, Nokomis, Center/ Sycamore and Ross' Winship bridges, plus removal of the fish ladder constraint, is to increase downstream flood flows. This increases potential flooding at the trash transfer station, spilling toxic waste into the surrounding habitat.	Chapter 2 Project Description Impact 3.9-5
Garril Page	The EIR/EIS states Alt J induces more frequent flooding downstream of Ross at, for example, the College of Marin per Appendix A sections 7.1,7.5.6, 8.2, 9.1 and in Areas of Controversy #5 above. Induced flooding is a significant adverse consequence, an added risk, and must be identified as such.	Impact 3.9-5
Garril Page	The proposed FAP Riparian Corridor lies within a watershed unique due to the quantity of sediment shed into its waterways. Prior projects repeatedly have miscalculated the effects of erosion and aggregation, and also have used incorrect, challenged Mannings 'n' values with resultant flawed concepts, dysfunction, and failed performance.	3.9.5 Impact Assessment Methodology
Garril Page	Partial consideration wherein only certain aspects and areas of the channel are included in studies and reports ensures continued failure: Winship Bridge to Lagunitas Bridge must be included the proposed project.	3.9.5 Impact Assessment Methodology
Garril Page	Adding 11 -17 new larger fish resting pools to the channel bottom has unknown effect on flow, sediment transport and sedimentation. Since formulas used to model proposals are limited by data uncertainty, odds of selecting correct assumption(s) essential to determining the appropriate computer programming lessen exponentially with additional unquantified designs.	3.9.5 Impact Assessment Methodology Impact 3.9-5 Impact 3.9-6
Garril Page	The new larger fish resting pools in the channel bottom creates unknown effect on the existing concrete structure's stability, coefficient of roughness, profile at the time of any given flood event. Therefore, reliable, accurate predictions of potential turbulence and other hydraulic effects become less likely.	3.9.5 Impact Assessment Methodology Impact 3.9-5 Impact 3.9-6
Samantha Hobart	Advise each property owner where the flood elevations are before and after any creek work is completed. Be able to	Impact 3.9-2

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
	discuss changes to individual's properties and not only a select few property owners like with the San Anselmo Flood Risk Reduction Project. Provide a Fish Ladder removal-only alternative. The root systems of the mature trees in Frederick Allen Park are an integral part of flood prevention and protection; removing these trees and their root systems will cause significant damage and increased risk to flooding and the erosion.	Impact 3.9-5 See also Chapter 5 Alternatives
Doug Ryan	What does the model being used show as the water level and flood levels before the San Anselmo Creek project and after? Does the impact of the Winship Bridge replacement have a similar effect on the houses downstream in the scope of this project and how is this accounted for? Why is so-called beautification being included as part of a flood control project? Resources are scarce and should be focused on flood control and nothing else. What does the beautification project do to reduce flooding?	Impact 3.9-5
Charles Goodman	The County is using the Army Corps EIR/EIS Plan J Bypass as the basis for their own EIR/EIS. This is flawed because the County has left out all of the residents of Sylvan Lane and Shady Lane from hydraulics and hydrology.	3.9.5 Impact Assessment Methodology, Impact 3.9-5
Charles Goodman	They have failed to account for any overload water flows from Bolinas Avenue, Fernhill, Southwood, Norwood, Ames or Lagunitas Road.	3.9.5 Impact Assessment Methodology
Charles Goodman	The EIR/EIS must address the significant impact on reducing the flow through Fred Allen Park, from supercritical flow to a 10-25 year level of Flood Protection (per comment from Liz Lewis, at the July 9, 2020 Ross Town Council Meeting). The number of 10-25 year is baseless and has not been verified by the County.	3.9.5 Impact Assessment Methodology
Charles Goodman	"The County must address sediment removal. (""This study's uncalibrated sediment budget estimates that the Corte Madera Creek Watershed supplies about 7,250 tons of bedload each year to the reach above Ross. The calibrated Parker-Klingerman sediment transport model estimated average bedload sediment inflow at Ross is about 6,750 tons/year. Using an average of the two results, the study estimates that about 7,000 tons/year of bed load are delivered to Ross, or about 450 tons/sq. mi. /year."") Source: Geomorphic Assessment of the Corte Madera Creek Watershed, final report. To remove 7,000 sediment at 20 tons per truck= 350 trucks (loads). Load 6 trucks per hour, (1 every 10 minutes) equals 58 hours or over 7 works days for	Impact 3.9-2

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
	removal. How does the County plan to mitigate this substantial disruption of removing sediment from the Town?"	
California State Lands Commission	"Sea-Level Rise: A tremendous amount of State-owned lands and resources under the Commission's jurisdiction will be impacted by rising sea levels. Because of their nature and location, these lands and resources are already vulnerable to a range of natural events, such as storms and extreme high tides. The State of California released the 2018 Update to the Safeguarding California Plan in January 2018 to provide policy guidance for state decision-makers as part of continuing efforts to prepare for climate risks. The Safeguarding Plan sets forth "actions needed" to safeguard ocean and coastal ecosystems and resources as part of its policy recommendations for state decision-makers. In addition, Governor Brown issued Executive Order B-30-15 in April 2015, which directs state government to fully implement the Safeguarding Plan and factor in climate change preparedness in planning and decision making. Commission staff believes the goals of the proposed Project are consistent with the guidance and recommendations presented in the Safeguarding Plan, and that Project would benefit coastal management agencies' efforts to plan for more resilient shorelines and minimize adverse ecosystem impacts resulting from sea-level rise. Please note that when considering lease applications, Commission staff will (1) request information from applicants concerning the potential effects of sea-level rise on their proposed projects, (2) if applicable, require applicants to indicate how they plan to address sea-level rise and what adaptation strategies are planned during the projected life of their projects, and (3) where appropriate, recommend project modifications that would eliminate or reduce potentially adverse impacts from sea-level rise, including adverse impacts on public access. Therefore, this information should be included in the Draft EIR."	3.9.5 Impact Assessment Methodology
CDFW	The State of California Sea-Level Rise Guidance/2018 Update (California Natural Resources Agency, 2018) provides a science-based methodology for state and local governments to analyze and assess the risks associated with sea-level rise and incorporate sea-level rise into their planning, permitting, and investment decisions. The Marin Shoreline Sea Level Rise Vulnerability Assessment/Bay Waterfront Adaptation & Vulnerability Evaluation (BayWAVE) (Marin County, 2017) provides context and	3.9.3 Environmental Setting – Sea Level Rise; 3.9.5 Approach to Impact Analysis

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
	estimates of the physical and fiscal impacts across the County's bayside shoreline over the coming decades. It includes sea level rise scenarios ranging from 10 inches in the near-term (15 years) to 20 inches in the medium-term (mid-century) and to 60 inches in the long-term (end of century). Since the purpose of the Project is to reduce long-term flood risk, and a portion of this downstream channel is tidal, CDFW recommends incorporating the long-term (end of century) scenarios for sea level rise, beyond the 15 year estimate, to fully evaluate Project impacts.	
Town of Ross	The EIR should identify all the potential CEQA impacts related to replacing the existing Park with the proposed floodplain park including the following information: – The impact of sediment buildup within the proposed floodplain and associated maintenance responsibilities – Mechanisms and procedures to keep the public safe during high water events.	Impact 3.9-2
Town of Ross	The EIR should illustrate the comparison of the 10-year and the 25-year flood risk reduction benefits under existing, existing with cumulative impacts, and proposed project conditions for all alternatives and including the "fish ladder only" alternative for the entire reach of Corte Madera Creek between San Anselmo and Kentfield and including all drainage tributaries within Ross.	Impact 3.9-5 Chapter 5 Alternatives
Marin Conservation League	Does the Project modeling and planning take into account the likelihood of greatly increased extreme storms and rainfall and how could these affect Project efficacy?	3.9.5 Impact Assessment Methodology
Marin Conservation League	What effect if any would the proposed Project have on sediment accumulation in the concrete channel and downstream in the natural channel bed?	Impact 3.9-2
Marin Conservation League	How do elements of the Project affect flood risk on Kent Avenue?	Impact 3.9-5
Marin Audubon Society	Guidelines of first finished floor as a mitigation measure for hydrology. Require a 1-foot margin of floor if District wishes to use first finished floor as a measure. Requests measure reflects first finished floor less 1-foot to protect the residents	3.9.5 Impact Assessment Methodology Impact 3.9-5
Marin Audubon Society	No mention of the over ground water and how that will be dealt with. The whole modeling has been so inconsistent as seen with the San Anselmo area, could be inaccurate. If you cause more flooding, who will be responsible?	3.9.5 Impact Assessment Methodology

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
Marin Audubon Society	Concerned about hydraulics and design of the project. When you have larger fish resting pools, it changes the way the water and the sediment moves in the channel.	Impact 3.9-2, Impact 3.9-5
Marin Audubon Society	In the watershed there is local drainage and a large source of flooding in Ross. Not considering the watershed, because not considering any local drainage.	3.9.5 Impact Assessment Methodology
Marin Audubon Society	Would like to see some specifics, what is the regrading of the fish ladder? How much regrading? Regrading affects the function; the function affects the hydraulics, and the hydraulics affects the results.	Project Description, 2.5 Project Elements and Design; Impact 3.9-2, Impact 3.9-5
Marin Audubon Society	Don't agree with the calculations of volume coming out of the creek – new Lagunitas Bridge will not handle that water. Water comes out at Lagunitas and Sylvan Lane and will flood all houses on Poplar. Homes not protected by project. Continually will not address the interior drainage that has no way of getting back into the concrete channel.	3.9.5 Impact Assessment Methodology Impact 3.9-5
Marin Audubon Society	Talk about sediment dynamics, want an explanation of what sediment dynamics consists of.	3.9.3 Erosion and Sedimentation
Marin Audubon Society	Modeling seems to be inaccurate and/or changing and people need to be aware there could be changes that may impact them negatively.	3.9.5 Impact Assessment Methodology

3.9.3 Environmental Setting

Corte Madera Creek Watershed Creeks and Drainage

Corte Madera Creek is in the Corte Madera Creek watershed (also referred to as the Ross Valley watershed) located in central eastern Marin County. The total watershed contains approximately 44 linear miles of stream channels and has a total land area of approximately 28.6 square miles, including portions of unincorporated Marin County and the towns of Corte Madera, Ross, San Anselmo, and Fairfax. The drainage basin extends approximately 8 miles on a northwest-southeast axis and averages approximately 3 miles in width. Elevations within the basin range from sea level at San Francisco Bay to 2,600 feet above mean sea level (msl) at Mount Tamalpais. Fifty percent of the basin lies below elevation 300 feet msl and 90 percent below elevation 1,000 feet msl. Streambed slopes range from 0 feet per mile in the lower reach of Corte Madera Creek, along the USACE Corte Madera Creek Flood Control Project (USACE Project) Units 1, 2, and 3, up to 20 feet per mile in the upper portions of Corte Madera Creek (USACE, 1966).

Corte Madera Creek and San Anselmo Creek are perennial streams and form the mainstem waterway of the watershed. San Anselmo Creek and its tributaries drain the northwestern

portion of the watershed. Ross Creek and its tributaries drain the northern slope of Mount Tamalpais, joining San Anselmo Creek from the west in the central part of the watershed. Downstream of the confluence of Ross Creek and San Anselmo Creek, the mainstem channel is known as Corte Madera Creek, which continues through the project area (Figure 3.9-1). The project is located in USACE Project Units 2, 3, and 4 within a portion of Corte Madera Creek that extends from just upstream of Lagunitas Road Bridge to approximately 500 feet downstream of Stadium Avenue. Approximately 18.1 square miles, or 63.3 percent of the total watershed area is tributary to the project area.

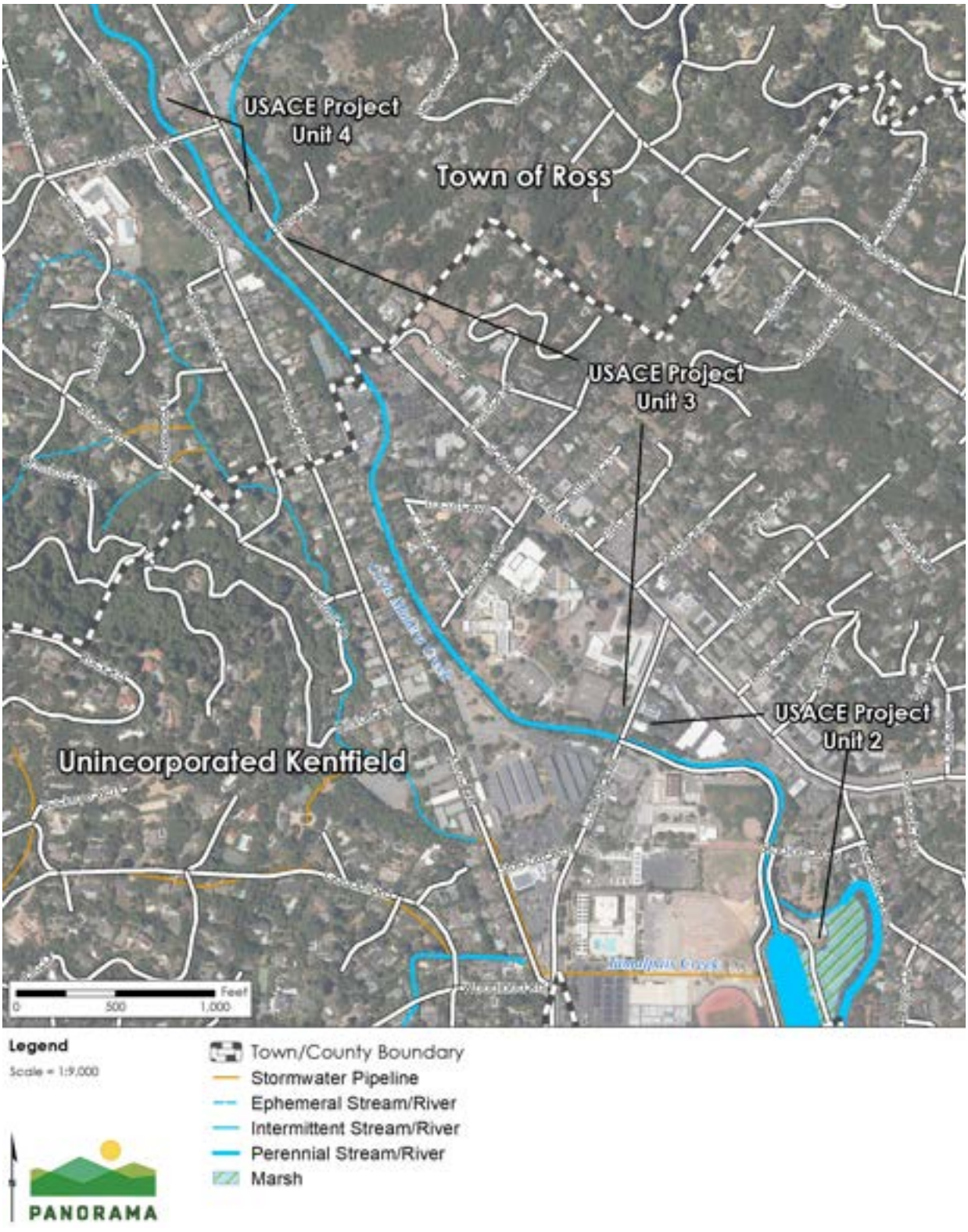
Hydrology and Geomorphology of the Corte Madera Creek Watershed

Marin County is characterized as having a temperate Mediterranean climate, with heavy rain in the winter and warm, arid summers. Eighty-three percent of the precipitation occurs during the months of November through March with less than 1 percent occurring from June through September (USACE, 1966; USACE, 2000a). Coastal fog is most common in summer, when it provides a minor source of precipitation, which is accentuated through leaf drip. Mean annual precipitation for the project area is 48 inches per year (WRCC, 2020). Snowfall is rare within the watershed and has no significant effect on flood peaks.

The upper parts of the watershed are hilly and mostly wooded (USACE, 2000a). The lower ridges and valley areas of the watershed are highly developed suburban residential and commercial areas. Development in the communities of Fairfax, San Anselmo, Ross, Kentfield, Larkspur, and Greenbrae has increased the area of impervious surfaces within the watershed, decreasing the amount of rainfall that can infiltrate into the soil. These changes in urban hydrology result in more runoff and higher peak flows than those which would occur under natural conditions (Royston 1977, in (USACE, 2010)).

Major runoff events occur during the rainy winter and spring seasons. Floods attributable to Corte Madera Creek are generally flashy and of short duration, whereby the creek water surface level rises quickly with the peak of the storm event and then recedes soon after. Flashy runoff patterns in the Ross Valley result from intense rainfall, the shape and steepness of the upper watershed surrounding the valley, and the lack of significant detention and infiltration in the urbanized valley. Tributaries rise rapidly so that flooding can begin a few hours after the occurrence of heavy rainfall (FEMA 2009a, in (USACE, 2010)). Streamflow peaks may occur generally within 3 to 5 hours after periods of intense rainfall and recede within 24 hours after the end of such storms (USACE, 1966). Historical accounts indicate that major storms occurred in 1951, 1960, 1966, 1982–1983, 1986, and 2005 (USACE, 1966; FEMA 2009a, in (USACE, 2010); Stetson 2009, 2011, 2007, in (USACE, 2010)). During the summer months and dry years, there is little rainfall-runoff inflow to Corte Madera Creek, but the creek is supported by baseflow and aquifer storage.

Figure 3.9-1 Corte Madera Creek – Waterbodies in Project Vicinity



Sources: (USGS 2020, USFWS 2020) (US Geological Survey 2013, U.S. Geological Survey 2016, Tele Atlas North America, Inc. 2020, Bay Area Open Space Council 2011)

Corte Madera Creek has a natural channel bottom through Unit 4 of the project area and is concrete lined through Unit 3 and portions of Unit 2, a distance of over 1 mile. At the terminus of the concrete-lined segment, the creek opens to an earthen channel and is joined by Larkspur and Tamalpais creeks before flowing into San Francisco Bay at the Corte Madera Marsh State Marine Park.

The District maintains a rainfall gage in Kentfield. Stage data at the Corte Madera Creek Ross Gage (Site ID: 5255) is published by the District. The United States Geological Survey (USGS) also maintains a stream gage on Corte Madera Creek in Ross (11460000).

Storm Drainage System

The municipal storm drainage system for the Town of Ross and unincorporated Kentfield area collects overland flow from stormwater runoff in storm drains. The runoff is piped under roads or in rights-of-way and outfalls into Corte Madera Creek. More than 10 existing outfalls are located within Units 2, 3, and 4 as shown in Section 3.15 Utilities and Service Systems, Figures 3.15-1 through 3.15-3. The pipe outfalls range from 18 to 72 inches in diameter and enter from both sides of the channel. For Corte Madera Creek watershed, overland flooding is caused by inadequate channel capacity and poor drainage in areas close to the stream (FEMA 2009a, in (USACE, 2010)).

There are two mechanisms for overland flow and flooding in the watershed. The first mechanism is when stormwater runoff collects from drainage areas throughout the watershed, route through the municipal storm drain system, then discharge to Corte Madera Creek. During this process, when the downstream storm drain system has inadequate capacity, the conveyance creates a backwater effect and stormwater either ponds and/or sheetflows overland in the drainage areas. The second mechanism is when Corte Madera Creek does not have sufficient capacity to convey collected stormwater runoff from the municipal storm drain system, the creek overtops and inundates the adjacent floodplain. The focus of this project is to address the second mechanism of overland flooding, which is due to capacity constraints at Corte Madera Creek.

Channel Morphology and Conveyance

Corte Madera Creek from Sir Francis Drake Boulevard to the Denil fish ladder (i.e., Unit 4) is primarily a natural channel with vegetated banks and a gravel bed. Structural elements include the bridge abutments at Lagunitas Road Bridge and retaining walls along much of Unit 4. The longitudinal slope of the channel is fairly consistent. The vertical drop from Sir Francis Drake Boulevard to the concrete-lined channel is 11.3 feet. The horizontal distance for this change is 4,050 feet, resulting in a slope of 0.28 percent. The land immediately adjacent to Corte Madera Creek generally appears flat but there is topographical variation that becomes important during flood stage (Royston 1977, in (USACE, 2010)).

From the confluence with Ross Creek downstream to the Lagunitas Road Bridge, the channel cross sections are fairly consistent. The channel is deeply incised 12 to 15 feet below the banks. The channel bottom is about 20 to 25 feet across. Banks along this section of Corte Madera Creek

range from 5:1 (horizontal: vertical) slope where concrete retaining walls are built (PWA, 2009a). The channel bed is characterized by 30- to 150-foot-long and 15- to 20-foot-wide lateral scour pool/riffle sequences with depths ranging from 0.5 to 1.5 feet average depth. Scour pools contain large woody debris, root wads, and substrate composed of small gravel, sand, and silt. The area has abundant shade (Rich, 2000). The Lagunitas Road Bridge was replaced in 2010 with a higher soffit that increased the creek capacity at the bridge crossing.

Downstream of the Lagunitas Road Bridge to the Denil fish ladder, the channel remains incised though the depth from the bank to channel bed begins to decrease (10 to 12 feet). The creek banks vary in steepness from a steep 2:1 vegetated slope to vertical retaining walls along the private properties at Sir Francis Drake Boulevard. The channel bed tapers from approximately 30 feet in width at the bridge to 15 feet in width at the downstream end of Unit 4. The channel bed is characterized by long (80 to 100 feet), shallow (from a few inches to about 1.5 feet average depth) alternating lateral scour pool and riffle sequences; riffles are very narrow (3 to 6 feet wide) and shallow. The low streamflows, riprap, and condition of the wooden retaining walls result in fairly stagnant pool areas. Riffle areas are extremely shallow. Substrate in the pool areas consists of sand, silt, and organic detritus; in the riffles, small gravel is the predominant substrate (Rich, 2000).

The creek channel, within and upstream of Unit 4, has considerable vegetation, primarily on the natural banks. This vegetation provides some protection to the underlying soil against erosion from water flowing in the creek. In addition, many homeowners have placed rock, timber, concrete and other materials on the creek banks to protect against scour and erosion (Royston 1977, in (USACE, 2010)). However, despite the vegetation and placed bank materials, the streambanks in Unit 4 are actively eroding along approximately 7,200 linear feet of bank. Royston (1977, in (USACE, 2010)) estimated that roughly 20 percent of the total length of bank would be subject to 1 foot of erosion per year.

In 1989 and 2000, soil conditions within Corte Madera Creek were evaluated (Copeland, 2000; Copeland & Thomas, Cortland, 1986). Streambed soils were found to be shallow with limited absorbing capacity. The basic purpose of the field survey was to determine where erosion problems might develop and to visually determine the types of soil exposed in the banks and in the creek bottom. Surveys indicated that generally the banks consist of clayey sands and sandy clays of relatively low plasticity. In the creek bottom, well-graded gravels were observed (Royston 1977, in (USACE, 2010)). Subsurface exploration near the town limits of Ross determined that the subsurface materials consist predominately of clays, sandy clays, and clayey sands. In general, the materials were firm or stiff except for the soft clay (Bay Mud) within Unit 2 (USACE, 1966).

Erosion and Sedimentation

Sediment dynamics refers to the process of erosion, transport and deposition of sediment in alluvial stream channels. Fluvial sediment processes are an important component of fluvial function; the fluvial process both creates the channel and floodplain form and transports nutrients and pollutants downstream. Sediment processes within a watershed are typically

divided into three classes: sediment generation zones (typically highest in the upper watershed), sediment transport zones (typically upper and mid watershed areas), and sediment deposition zones (typically in the lower watershed areas of the creek). These tendencies can vary highly across a watershed depending on geology, soils, historic land uses, and other factors.

Sediment originates in the steeper, upper watershed areas of Corte Madera Creek, and is transported to Units 2, 3, and 4. Sediment transported to and deposited in Corte Madera Creek affects the conveyance capacity of the channel. Sediment deposition has historically occurred in the creek at the Lagunitas Road Bridge and farther downstream in Units 1, 2, 3, and 4, including the concrete-lined channel (Copeland, 2000). Sediment deposition in the concrete-lined channel ranged from 0 feet at the Kentfield Hospital Bridge to 4.65 feet at the downstream end of the concrete channel in 2015 (Stetson, 2015).

Sediment yield from the upper watershed is high due to a combination of geology and historic land uses. Natural landslides and earth flows in the upper watershed areas also periodically overwhelm the creeks with large volumes of fine-grained sediment (Stetson, 2000). In the description of the Corte Madera Watershed in the Integrated Regional Water Management Plan Report (Marin County, 2013), two highly erosive subwatersheds were identified. The Sleepy Hollow Creek subwatershed is identified as contributing 26 percent of total coarse-grained bedload sediment (as compared to fine-grained suspended sediment) inflow at the Town of Ross. The most probable sources of sediment are identified as active hillslope processes (e.g., slumps/land sliding). The San Anselmo Creek subwatershed is described as contributing 29 percent of total coarse-grained bedload sediment inflow to the creek within the project area (Marin County, 2013).

Sediment deposition rates are high in Units 2 and lower Unit 3 of Corte Madera Creek because of the combined influence of low channel slope in the concrete-lined channel and tides. More gentle sloped channels, other things being equal, have less driving energy and stream velocities. Lower stream velocities together with the stream meeting an incoming tide makes sediment fallout of suspension or transport and deposit. Incoming sediment from Corte Madera Creek and San Francisco Bay is conveyed on incoming tides, adding to the sediment load.

After USACE construction of the lower portions (Units 1, 2, and 3) of the Corte Madera Creek Flood Control Project (CMCFCP) in the 1970's, the channel began to aggrade at rates much greater than anticipated and the District was unable to maintain the channel at its design depth. Nonetheless, the earthen channel section in Units 1 and 2 (i.e., downstream of the stilling basin) contained the 1 percent AEP flood event that occurred in December 2005 without overbank flow. In an attempt to restore the original channel design depth, Units 1 and 2 were dredged in 1986, and the stilling basin was dredged again in 1998. Unit 4 below Sir Francis Drake Boulevard, upstream of the concrete-lined channel, is also depositional, with the channel bed aggrading (Stetson, 2000).

Flooding

Overbank flooding in Ross Valley, such as in 1982 to 1983, and 2005, occurs when streamflows exceed the conveyance capacity of the Corte Madera Creek channel. Structures on the creeks constrain flow causing water levels to rise and when flows are great enough, they breach the main channel transmitting flow into overflow paths (PWA 2000, in (USACE, 2010)). The Denil fish ladder, in its current condition, is a primary flow constriction for Unit 4 reach and upstream that causes extensive overbank flooding along Corte Madera Creek. The Denil fish ladder is also a barrier to fish passage. Bridge constrictions and poorly designed residential streambank stabilization structures have also exacerbated flooding on this naturally flood-prone system (Stetson 2006).

The USACE has conducted numerous studies focused on evaluating the performance of Units 3 and 4 since 1971 (USACE, 1966, 1974a, 1974b, 1987a, 1987b, 1988, 2000a, 2000b; Stetson 2008, in (USACE, 2010; USACE, 2018)). These studies identified a hydraulic constraint through the transition from Unit 4 to Unit 3 created by the existing Denil fish ladder and the narrow channel condition on the east and west bank.

The USACE has prepared several studies to assess the hydrologic conditions at Corte Madera Creek, beginning with those described in Design Memorandum No. 1 (USACE, 1966). The standard project flood (SPF)[1] discharges were estimated to be 7,500 cubic feet per second (cfs) for Corte Madera Creek within the project area, based on a 3-day reference storm that occurred in Hollister, California in December 1955 (USACE, 1966; USACE, 1988). The SPF estimate did not provide for upstream storage and assumed that the Corte Madera Creek channel and tributaries were fully modified upstream to Fairfax. Due to local opposition, the USACE's 1960's era concrete flood control channel construction ceased at the Town of Ross upstream of Unit 3.

Immediately upstream of where concrete flood control work on the channel stopped, channel capacity in the section of Corte Madera Creek between Lagunitas Road Bridge and the concrete channel currently ranges from about 3,300 to 4,000 cfs based on recent observations of when flow levels exceeded channel capacity and went overbank. The left bank (north side of creek toward Sir Francis Drake Boulevard) downstream of Lagunitas Road Bridge was overtopped during the December 15, 2016, January 10, 2017, and February 7, 2017, storm events when the observed peak discharges at the Ross Gage were about 3,380, 3,690, and 3,710 cfs respectively (Stetson, 2017).

[1] The standard project flood is defined by USACE as that flood produced by the standard project storm which is the most critical storm on record within a region meteorologically homogeneous with the basin under study, or the most critical storm on record in adjacent regions that can be reliably transposed to the subject basin, occurring at a time when conditions for runoff are favorable.

Overbank and Floodplain Flow

Overbank flows on San Anselmo and Corte Madera Creeks have historically led to significant flooding in the towns of San Anselmo and Ross. Previous studies have been performed to assess the location and source of overbank flooding on these creeks (PWA 2009b; Stetson, 2011). The Ross Valley Capital Improvement Plan (CIP) study (Stetson, 2011) estimated that, with respect to flows exceeding 2,800 cfs, backwatering from the Madrone Avenue Bridge causes San Anselmo Creek to breach the right bank of the main channel at Nokomis Avenue. The diverted flow then travels as split flow through San Anselmo and rejoins the creek corridor near its confluence with Ross Creek. Additional overbank flow caused by backwater buildup at the Sycamore Avenue Bridge contributes to the overbank flow generated at Nokomis Avenue. In the Ross Valley CIP study (Stetson, 2011), it was estimated that split flow at Sycamore Avenue Bridge is likely to occur at flows exceeding 3,100 cfs at that location. Overbank flows originating near downtown San Anselmo run down San Anselmo Avenue and along Shady Lane in Ross where they join with overflow occurring upstream of Lagunitas Road Bridge. The combined floodwaters flow through Ross Commons and down Poplar Avenue in Ross and Kent Avenue in Kentfield before finally returning to the concrete-lined channel downstream of College Avenue in Kentfield.

Within Unit 4, a split flow condition has historically been exacerbated by backwater buildup at Lagunitas Road Bridge. The Lagunitas Road Bridge was replaced in 2010, which increased the flood capacity of the channel. With the current Lagunitas Road Bridge, a split flow is estimated to occur at flows exceeding 3,630 cfs where flows exit the creek channel and contribute to flooding in Ross and Kentfield (Stetson, 2017). The Lagunitas Road replacement bridge was designed to convey about 5,400 cfs before the water surface reaches the bridge soffit.

Historical Flooding

Corte Madera Creek has flooded numerous times over the past 70 years. Floods causing major damage occurred in 1951, 1955, 1960, and 1966 (pre-project), and 1982–1983, 1986, and 2005 (post-project) (USACE, 1966; FEMA 2009a, in (USACE, 2010)); Stetson 2007, 2009, 2011, and 2017). Before the initiation of the federal project (CMCFCP), in 1969, the most severe flood for which measurements were obtained occurred in December 1955 (FEMA 2009a, in (USACE, 2010)). This flood had an estimated maximum discharge of about 5,500 cfs at the U.S. Geological Survey (USGS) Ross gauging station (Ross Gage). The peak discharge of 5,500 cfs for the water year 1956 flood was estimated by interpolation based on the FEMA's flood frequency curve and FEMA's estimate of 1956 flood as a 4 percent AEP flood (FEMA). The USGS database shows that the water year 1956 flood had a peak discharge of 3,620 cfs at the Ross Gage, which did not account for out-of-channel flow (Stetson, 2007). Since the federal project was built, more severe floods occurred in 1982 and 2005. The January 3 to 5, 1982 storm produced the largest recorded flood flow at the Ross Gage. The runoff resulted from a 32-hour rainstorm that became stationary and produced a continuous downpour that averaged about ¾ inch per hour for six hours. Most of the rain gages overflowed during the storm, so reliable statistics were unavailable, though part of the basin had more than 15 inches of rainfall. The storm produced a peak flow at the Ross Gage estimated at 7,200 cfs with an estimated recurrence interval greater

than 100 years (USACE, 2000a; USACE, 2000b). The flood inundated all of the low areas of the watershed, causing considerable damage in San Anselmo, Ross, Kentfield, and Larkspur. The December 31, 2005, storm produced the second largest recorded flood flow. The December 31, 2005 flood was estimated to be about 6,800 cfs at the Ross Gage, which included in-channel flow and out-of-channel flow (Stetson, 2007).

In 1953, the District Flood Zone 9 was created and in 1969 the USACE began construction of the flood control project that included Units 1, 2, and 3. Construction at the downstream end created a trapezoidal earthen channel and, further upstream, a concrete-lined channel part way through the Town of Ross. In 1982, up to 5 feet of flood water caused considerable damage in San Anselmo, Ross, Kentfield, and Larkspur. On January 1, 2006, flooding caused over $70 million in damage when the creek overtopped the banks and destroyed properties in San Anselmo and nearby communities (District, 2000; Friends of Corte Madera Creek, 2004; FEMA 2009a, in (USACE, 2010)). In response to the urgency created by this flood, the County of Marin authorized the development of the Ross Valley Flood Protection Program to respond to the concerns of business owners and residents in Ross Valley. The Ross Valley Flood Protection and Watershed Program utilizes a community-based participatory planning and design process that incorporates input from Ross Valley residents and stakeholders to help shape and implement solutions which significantly reduce local flood risk (District, 2020).

Flooding Near Project Elements

The threat of flooding is a significant problem in the project area. Several existing flood management focused documents ((USACE, 2010), (PWA, 2009b); (USACE, 2000a), (USACE, 2000b); Stetson 2006, 2009, 2011, 2007 and 2008, in (USACE, 2010) (USACE, 2018)) have evaluated flooding conditions in the project area. Historical flooding from Corte Madera Creek was primarily due to the relatively small capacity of the creek channel within Unit 4, the historical constriction of flow from the insufficient opening under the old Lagunitas Road Bridge, and backwater created from the transition into the concrete-lined Unit 3 channel and from the downstream inter-tidal mixing zone.

Historically, flows greater than about 3,200 cfs to 3,600 cfs overtopped Sylvan Lane upstream of the old Lagunitas Road Bridge. The current channel hydraulic capacity with the 2010 replaced Lagunitas Road Bridge in place is estimated to be about 3,630 cfs at the most constrictive location of the channel (Stetson, 2017).

Flood Hazard Areas

Following development of the SPF, several flood frequency analysis methods were used to study Corte Madera Creek stream flow data collected at the Ross Gage. A 1999 flood frequency analysis, conducted by the USACE, relied on USGS streamflow measurements associated with the original 1951 rating curve (Stetson 2006). Over the subsequent four decades of monitoring the channel had aggraded nearly 4 feet (Stetson 2007, in (USACE, 2010)). The USGS did not update the rating curve until 1987 to account for the cross-sectional change at the gage due to the deposited sediment. These bed level changes were reported to have affected the accuracy of the historical measurements taken at the Ross Gage and the reliability of the USACE's 1999

flood frequency analysis and flood frequency curve (Stetson 2006). The study published an updated stage-discharge rating curve (low-flow range) for the gage based on field measurements of discharges at different creek stages. The rating curve for the Ross Gage was evaluated for its peak stage measurements at the gage to determine annual peak flow discharges after 1993. Using this data of annual peak discharges, a flood frequency analysis was conducted using the 1987 version of HEC-WRC[2] program (Dawdy 2006, in (USACE, 2010)). The 2006 analysis relied on 55 years of data (including the historic USGS data).

The USACE performed statistical analyses using HEC-SSP[3] to develop relationships between the magnitude of flood flow and probability of occurrence in any given year (USACE, 2008). The updated USACE analysis included 57 years of data and relied on the published USGS historical peak flow values. The minor differences between the results of the 2006 and 2008 analyses reflect datasets, model selection (Firth, 2010), and computed versus expected probability used in each study.

More recent flood frequency analysis was performed using HEC-flood frequency analysis, as described in Technical Memorandum No. 1 of the 2011 Ross Valley CIP study (Stetson, 2011), using historical annual peak discharges at the Ross Gage. The flood frequency analysis is shown in Figure 3.9-2. Table 3.9-2 presents the flood frequency analysis results for each of the published flood frequency analysis studies, as well as the published FEMA values, where available. The peak discharge estimates at the Ross Gage under existing conditions in the Stetson 2011 CIP Study (as shown in Table 3.9-2 below) were adopted for this EIR analysis in order to match the flood frequency data used by countywide flood management programs[4].

A 1977 report estimated the 1 percent AEP flood flows entering the project area to be 3,700 cfs from San Anselmo Creek, 900 cfs from Ross Creek, and a combined overland flow of 2,300 cfs for a total of 6,900 cfs (Royston 1977, (USACE, 2010). The USACE estimated that approximately 4,700 cfs remained in-channel and 2,500 cfs flowed out-of-channel during the 1982 flood (USACE, 2000a). This channel flow estimate corresponds to an approximate 10-year peak flood discharge.

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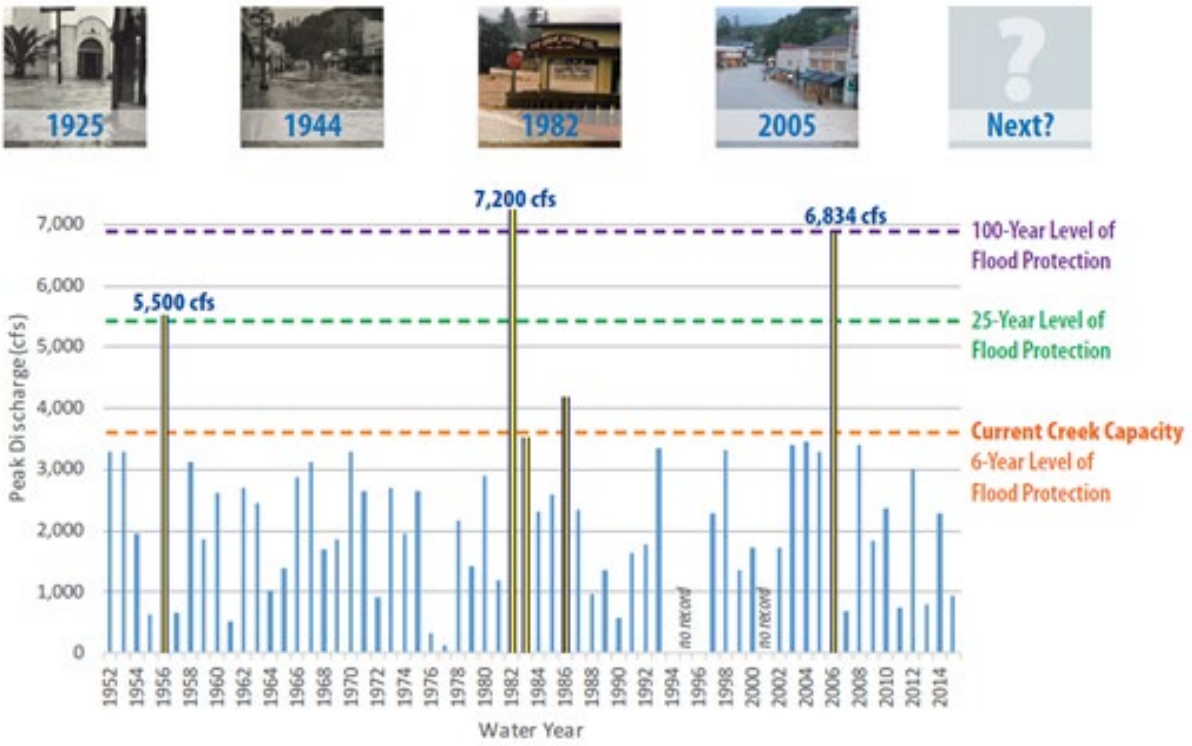
[2] The HEC-WRC program has included several updates since its inception in 1978. The program is currently called HEC-flood frequency analysis which reflects techniques described in the revised, "Guidelines for Determining Flood Flow Frequency," Bulletin 17B, 1982.

[3] HEC-SSP is software developed by USACE to perform statistical analyses of hydrologic data. The current version of HEC-SSP can perform flood flow frequency analysis based on Bulletin 17B. The program can perform generalized frequency analysis on flow data and a volume-duration frequency analysis on high and low flows.

[4] The Stetson 2011 CIP Study used the available historical annual peak discharges up to 2010. At this time no attempt was made to update the FFA using the data collected since 2010. This way the 2018 EIS/EIR used the same flood frequency data as the countywide flood management programs. It would be expected that the flood frequency would have little change even if the data collected since 2010 were used. This is because no major floods have occurred since 2010.

Figure 3.9-2 Corte Madera Creek Historical Peak Annual Discharge



Source: (District, 2020)

The current (effective) Marin County Flood Insurance Study and countywide Flood Insurance Rate Map were issued on August 15, 2017 (FEMA, 2017). Peak discharge data were published for Corte Madera Creek in the effective Flood Insurance Study (FEMA, 2017).

Floodway and Tsunami Inundation Zones

Given that project construction would involves work in or along the creek channel, the project area at least partially would overlaps the regulatory floodway. A small portion of Unit 2, Lower Corte Madera Creek, is in the Tsunami Inundation Area (California Emergency Management Agency, 2009) (see Figure 3.9-3 below). Any locations where the proposed project would cause an increase in the 100-year base flood elevation within the regulatory floodway would require a Conditional Letter of Map Revision from FEMA.

Groundwater

Groundwater and surface water are often hydraulically connected to some degree in natural streams. Surface water may infiltrate and become groundwater, or groundwater may discharge to the surface and become surface water. During the dry season, groundwater normally has cooler temperatures than the surface water flowing in the creek and, thus, groundwater discharge to the surface has a cooling effect, which makes the stream more suitable for cold freshwater habitat. While the project has primarily surface water components, information on groundwater hydrology has been included in this document as necessary to determine its relationship to surface water in the creek.

Table 3.9-2 Comparison of Peak Flood Discharges

	Dawdy, 2006 (cfs)	USACE, 2008 (cfs)	Stetson CIP, 2011 (cfs)	FEMA Flood Insurance Study 2009 (cfs)	FEMA Flood Insurance Study 2014 (cfs)	FEMA Flood Insurance Study 2017 (cfs)
2-year	2,130	2,106	2,130	—	—	—
5-year	3,630	3,620	3,490	—	—	—
10-year	4,520	4,555	4,370	4,060	3,871	4,060
20-year	5,280	5,368	5,180	—	—	
50-year	6,120	6,295	6,180	6,200	6,022	6,200
100-year	6,650	6,903	6,890	6,900	7,049	6,900
200-year	7,120	7,442	7,560	—	—	—
500-year	7,630	8,063	8,400	8,400	9,334	8,400

Notes:

[a] All peak flood discharges were calculated based on historical discharges at the Ross Gage (USACE, 1966).

[b] Results from the Stetson 2011 CIP Study were adopted for this analysis because they were recent and comprehensive.

[c] All analyses except the FEMA 2014 Flood Insurance Study used the Log-Pearson III Method to derive the peak flow estimates.

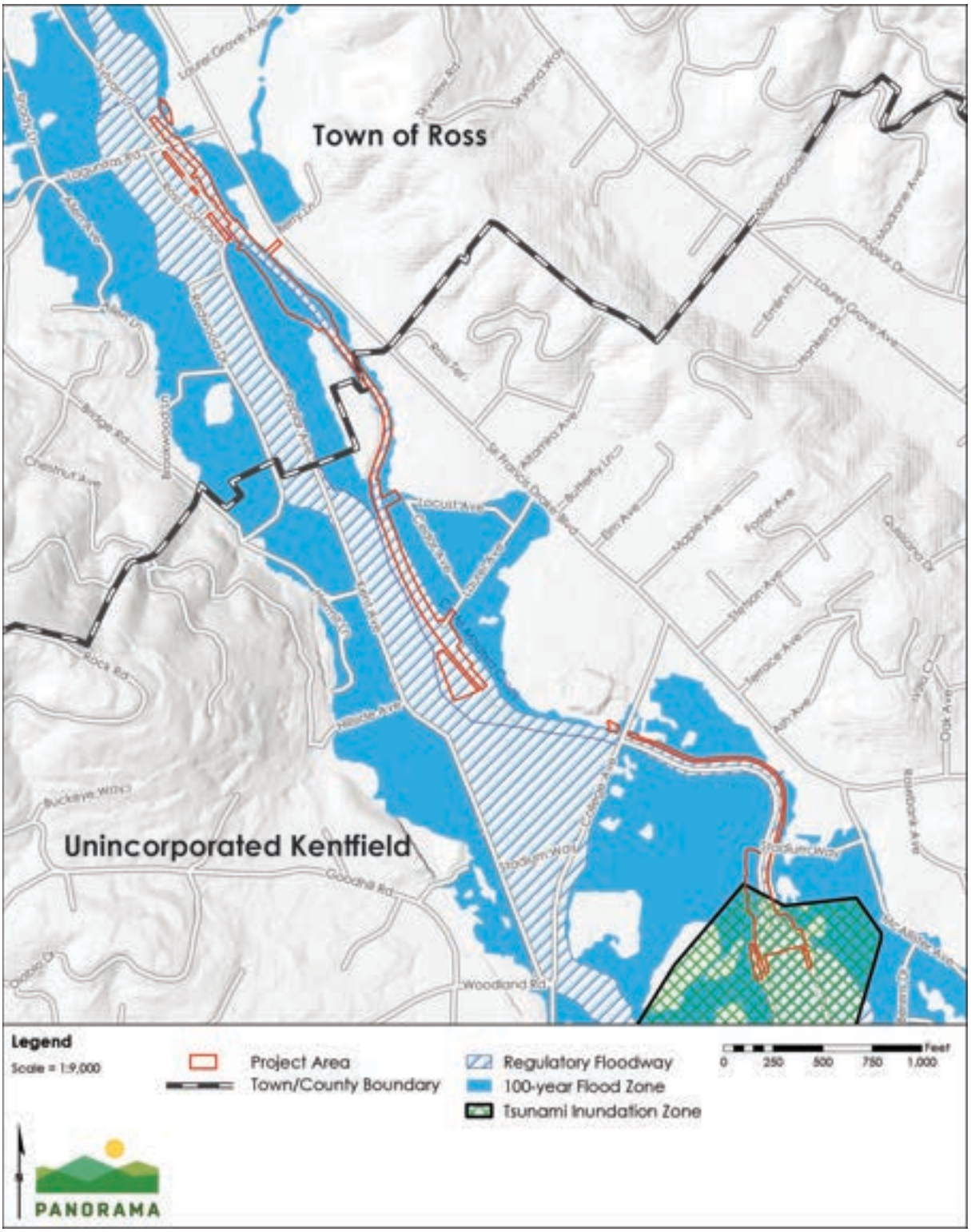
The FEMA 2014 Flood Insurance Study used a calibrated HEC-HMS model to simulate the peak flows for selected 24-hour design storms associated with the 10-, 2-, 1-, and 0.2-percent-annual-chance rainfall events (which are 6.03 inches, 8.09 inches, 9.0 inches, and 11.02 inches, respectively, in the HEC-HMS model; (PWA, 2009a)).

[d] Given that long-term historical annual peak flow records are available for the Ross Gage, use of the Log-Pearson III flood frequency analysis method based on historical annual peak flows is more reliable than 2014 FEMA's use of HEC-HMS hydrologic modeling based on selected 24-hour design storms. Rainfall-runoff modeling methods are normally used only for ungaged streams, not for gaged streams with long-term historical records of annual peak flows (FEMA, 2009b).

[e] The FEMA 2017 (effective) Flood Insurance Study directly used the results from the FEMA 2009 Flood Insurance Study. The peak flow estimates documented in the FEMA 2017 (effective) Flood Insurance Study are very close to those estimated by the Stetson 2011 CIP Study.

Source: (USACE, 2018)

Figure 3.9-3. Floodway and Tsunami Inundation Zones



Source: (GHD, 2020)

The Ross Valley groundwater basin underlies the downstream portion of Corte Madera Creek before its terminus at San Francisco Bay (SFBRWQCB, 2017). In the Project area, much of the Corte Madera Creek channel is concrete, which limits infiltration from the creek in the project area. Unit 4 is the only portion of the project area where creek infiltration can occur.

According to DWR, the project area is not located on a groundwater basin that produces, or has potential to produce, significant amounts of groundwater (DWR, 2019). While existing beneficial uses for the Ross Valley Groundwater Basin include municipal/domestic and agricultural water supply, and potential beneficial uses are industrial service water supply (without water quality limitations) and industrial process water supply (with water quality limitations) (SFBRWQCB, 2017), the groundwater basin is not a source of potable water and groundwater in Ross Valley is currently used only for landscape irrigation (Marin County 2005a). Examination of soil samples from borings and well data collected at the College of Marin from 2013 to 2015 indicates ground water level are expected to be 7.5 to 10.5 feet below the ground surface in the vicinity of the project area (Environmental Resource Group, Inc., 2013).

Additional groundwater basin characteristics were published in the Marin Countywide Plan (Marin County, 2007). The study found that the Ross Valley Groundwater Basin was located at a depth of 10 to 60 feet below ground surface. The basin's storage capacity was estimated at 1,380 acre-feet and covered an area of 18 square miles. The perennial safe yield was estimated at 350 acre-feet.

Tidal Influence

Corte Madera Creek is tidally influenced from the natural channel bottom brackish marsh in Unit 2 to approximately 400 feet downstream of the Kentfield Hospital bridge within the concrete-lined channel (Stillwater Sciences, 2020). Average tidal fluctuations in the concrete-lined channel range from 0.06 feet relative to the North American Vertical Datum of 1988 (NAVD88) at mean-lower low-water (MLLW) to 5.90 feet NAVD88 at mean-higher-high-water. The 1 percent AEP tide elevation is estimated to be 9.0 feet NAVD88 in the FEMA 2009 Flood Insurance Study. However, the FEMA 2017 Flood Insurance Study shows the 1 percent AEP tide elevation to be 9.7 feet NAVD88. An extreme high tide of 8.88 feet NAVD88 was measured during the January 27, 1983, coastal flood event at the San Francisco Bay tidal gage station (NOAA #9414290) over a period of record of more than 160 years dating back to 1855.

Sea Level Rise

Global sea levels are rising due to impacts from climate change and increased concentrations of atmospheric greenhouse gases. Both thermal expansion and melting land ice contribute to rising sea levels. Since Corte Madera Creek empties into San Francisco Bay and portions of the creek experience tidal effects, sea level rise will influence the hydrology of the creek. As sea level rises, tidal influences will increase in sections of the creek where they already occur, and tidal action will expand further upstream. Higher tides linked to sea level rise will also exacerbate flooding during major storm events. Estimates for sea level rise in the San Francisco Bay area vary greatly (Table 3.9-3) due to the complexity of, and uncertainty associated with, the

variables used in present models. The sea level rise projection used in modeling for the project is based on the estimated relative sea level change from 1992, the last National Tidal Datum Epoch (NTDE), to 2067 at the San Francisco NOAA Tidal Gage (Station ID: 9414290).

Table 3.9-3 San Francisco Bay Sea Level Rise Estimates

Year	Bay Wave	CNRA 2018	NRC 2012 Projection	NRC 2012 Range	USACE 2019 Low	USACE 2019 Int	USACE 2019 High
2030	10″	0.5 feet	5.7″ ± 2″	2″-12″	3″	4.6″	9.5″
2050	20″	1.1 feet	11″ ± 3.6″	5″-24″	4.6″	8.2″	19.6″
2070		1.9 feet			6.1″	12.7″	33.2″
2100	60″	3.4 feet	36″ ± 10″	17″-66″	8.5″	21.0″	60.5″

[a] Bay Wave and NRC values relative to year 2000 and USACE values relative to 1992.

[b] CNRA 2018 values based on 2000 baseline year.

[c] Project lifespan expected to be roughly 50 years.

[d] USACE 2019: Used USACE Sea Level Change Calculator (2017.55), San Francisco Gauge, NOAA 2006 SLC Rates.

Sources: (Marin County, 2020c; Council, 2012; Engineers, 2019; CNRA, 2018)

The USACE intermediate curve for relative sea level change was used to estimate the 1.0-foot coastal water level increase, between 1992 and 2067. With the mean higher-high water level of 6.65 feet at the San Francisco Gage, the estimated coastal water level in 2067 is 7.65 feet (USACE 2018).

In order to better understand the long-term post-project condition with projected sea level rise, an additional sea level rise scenario is considered in this EIR. The additional projection of sea level rise reflects the year 2100 planning horizon. The projection is based on the 2018 Update of the State of California Sea-Level Rise Guidance (CNRA, 2018), under the likely range of 66 percent probability sea-level rise estimate with a high emissions projection. The sea level rise projection is 3.4 feet, from the baseline year of 2000. With the existing mean higher high water level of 5.95 feet and the interannual variation of 0.7 feet, the estimated coastal water level in year 2100 under this scenario is 10.05 feet.

Water Quality

Corte Madera Creek has a number of tributaries that flow from open space headwater areas through urbanized areas to San Francisco Bay. The creek experiences a variety of water quality problems related to nonpoint-source pollution from urban runoff (4.1 miles of storm sewers), septic systems, road and bank erosion; specific concerns include pesticides, bacteria, particulates (sediment), and nutrients (Town of Ross 2009, CCA 2002, in (USACE, 2010)). The SFBRWQCB provides information on sediment, pathogens, and diazinon as pollutants of concern. Pathogens of concern are Enterococcus (in Corte Madera Creek), and E. coli (in the tributaries) (Friends 2006, in (USACE, 2010)). Nutrient loading from runoff and sewage

contribute to growth of algae and other aquatic plants in portions of Corte Madera Creek, particularly areas that are unshaded by riparian vegetation (Town of Ross 2009, in (USACE, 2010)).

Erosion originating primarily from headwater areas and, to a lesser extent, creek banks in the towns, result in increased sedimentation in the creeks (Stetson, 2000).

Marin County completed water quality testing in accordance with the Small MS4 General Stormwater Permit in 2016, including at one location along Corte Madera Creek (at Lagunitas Road Bridge). Constituents monitored included over one dozen pesticides (including diazinon); parameters also measured included organic carbon, suspended sediment, total dissolved solids, turbidity, water temperature, pH, electrical conductivity, and dissolved oxygen (MCSTOPPP and City of Petaluma, 2016). At the Lagunitas Road Bridge, diazinon was not detected during the three sampling events conducted, and dissolved oxygen concentrations met the water quality objective (MCSTOPPP and City of Petaluma, 2016).

Corte Madera Creek is on the USEPA-approved 303(d) List of Water Quality Limited Segments. Corte Madera Creek is tributary to the San Francisco Bay and the San Francisco Bay is also listed on the approved 303(d) list. Table 3.9-4 lists the beneficial uses and impairment status of water bodies in the project area, including the pollutants that cause the impairments. Once a water body is placed on the 303(d) List of Water Quality Limited Segments, it remains on the list until a Total Maximum Daily Load (TMDL) is adopted and the water quality standards are attained or there are sufficient data to demonstrate that water quality standards have been met and delisting should take place.

Corte Madera Creek is impaired for the pesticide diazinon, although this listing may be related to the overall impairment of the San Francisco Bay rather than specific measurements for diazinon within Corte Madera Creek. The SFBRWQCB 2005 plan amendment cites earlier data showing no detectable diazinon (less than 30 nanograms/liter) in water samples from Corte Madera Creek. A TMDL has been approved in the Basin Plan for all urban creeks to address the impairment (SFBRWQCB, 2017). An attainment strategy to achieve the TMDL has identified the sources of diazinon loading in the watershed and specified actions to address them; public participation has been important in setting effective and achievable TMDLs and attainment strategies (Marin County, 2005a; Marin County, 2007b) and will continue to be central to improving water quality.

High coliform bacteria counts have been detected during the winter months in various segments of the creek (Marshall et al. 1994, as cited in (Rich, 2000)). Friends of Corte Madera Creek Watershed (2006) found elevated levels of both E. coli and Enterococcus at several stations within Corte Madera Creek. Although the Friends of Corte Madera Creek Watershed (2006) study found Enterococcus counts to be highly variable, these counts periodically exceeded federal contact recreational criteria. Corte Madera Creek also exhibits high water temperatures. These increased temperatures have been attributed to urbanization of the watershed, specifically the reduction of shaded stream surface area due to loss of riparian

vegetation and increased channel width, although less so within Unit 4 (Friends 2008a, in (USACE, 2010). Increased temperatures also have been attributed to low streamflow, caused by groundwater pumping for irrigation, and lack of infiltration, caused by extensive impermeable surfaces. Measured water temperatures in the project area are high beginning in late May and extending through September, ranging from 65 to 75 degrees Fahrenheit (°F) (Rich, 2000), with higher temperatures being recorded within the concrete-lined sections of Corte Madera Creek. These higher temperatures are stressful for migrating salmonids, but thermal refugia may be available to fish either due to the presence of pockets with limited mixing, combined with daily temperature fluctuations, or the presence of deeper pools in areas of the creek which are not concrete-lined (Rich, 2000). Elevated water temperatures may also exacerbate existing problems with algae and aquatic plant growth (Town of Ross 2009, in (USACE, 2010)).

Table 3.9-4 Beneficial Uses and Impairment Status

Water Body	Beneficial Use(s)	Impairment Status	Pollutants
Corte Madera Creek	COMM, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2, NAV	303(d) List, Category 4a - Being addressed with USEPA approved TMDL	Diazinon
Ross Valley Groundwater Basin	Existing - MUN, AGR Potential – PRO, IND		
San Francisco Bay, Central	IND, PRO, COMM, SHELL, EST, MIGR, RARE, SPWN, WILD, REC-1, REC-2, NAV	303(d) List, Category 5	Chlordane, DDT, Dieldrin, Dioxin compounds, Furan compounds, Invasive Species, Mercury, PCBs, PCBs (dioxin-like), Selenium, and Trash

AGR – Agricultural Supply	RARE – Preservation of Rare and Endangered Species
COMM – Commercial and Sport Fishing,	SHELL – Shellfish Harvesting
COLD – Cold Freshwater Habitat	SPWN – Fish Spawning
EST - Estuarine Habitat	WARM – Warm Freshwater Habitat
IND - Industrial Service Suppl	WILD – Wildlife Habitat
MIGR - Fish Migration	REC-1 – Water Contact Recreation
MUN – Municipal and Domestic Supply	REC-2 – Noncontact Water Recreation
PRO – Industrial Process Supply	NAV – Navigation

Sources: (SWRCB, 2018), (DWR, 2019), (SFBRWQCB, 2017)

3.9.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the U.S. Environmental Protection Agency (USEPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters by implementing water quality regulations. Multiple sections of the CWA apply to activities near or within surface or ground water.

Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (USACE) to regulate the discharge of dredged or fill material to waters of the U.S., including wetlands (33 U.S.C. Section 1344). The USACE issues site-specific individual or general (i.e., Nationwide) permits for such discharges.

Under Section 401 of the CWA, any applicant for a federal license or permit to conduct any activity that may result in any discharge into navigable waters must provide the licensing or permitting agency with a certification that the discharge would comply with the applicable CWA provisions (33 U.S.C. Section 1341). If a federal permit is required, such as a USACE Section 404 Nationwide Permit for dredge and fill discharges, the Project proponent must also obtain a Section 401 Water Quality Certification from the RWQCB.

Section 402(p) of the CWA regulates discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) Program, a nationwide surface water discharge permit program for municipal and industrial point sources. In California, NPDES permitting authority is delegated to and administered by the nine RWQCBs. Under Section 402, the SFBRWQCB has set standard conditions for each permittee in the Bay Area, including effluent limitation and monitoring programs. In addition to their responsibility to issue and enforce compliance with NPDES permits, the RWQCBs are responsible for preparation and revision of the relevant regional Water Quality Control Plan, also known as the Basin Plan (discussed further under State regulations).

Section 303(d) of the CWA requires that each State identify water bodies or segments of water bodies that are "impaired" (i.e., do not meet one or more of the water quality standards established by the State, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology). USEPA must approve the 303(d) List before it is considered final. Inclusion of a water body on the Section 303(d) List of Impaired Water Bodies triggers development of a TMDL for that water body and a plan to control the associated pollutant/stressor on the list. The TMDL is the maximum amount of a pollutant/stressor that a water body can assimilate and still meet the water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The Basin Plan is amended to legally establish the TMDL and to specify regulatory compliance, including specification of waste load allocations for entities that have permitted discharges.

Federal Antidegradation Policy

The federal Antidegradation Policy, established in 1968 under Section 303 of the Clean Water Act, is designed to protect existing uses and water quality and national water resources. Implementation of antidegradation by the states is based on a set of procedures to be followed when evaluating activities that may impact the quality of the waters of the U.S. Antidegradation implementation is an integral component of a comprehensive approach to protecting and enhancing water quality of both surface water and groundwater.

Rivers and Harbors Act of 1899

The Rivers and Harbors Act of 1899, as amended and codified in 33 U.S.C. Section 408 provides that USACE may grant permission for another party to alter a Civil Works project upon a determination that the alteration proposed will not be injurious to the public interest and will not impair the usefulness of the Civil Works project.

National Flood Insurance Program

The FEMA determines flood elevations and floodplain boundaries based on USACE studies. FEMA also distributes the flood insurance rate maps used in the NFIP. These maps identify the locations of special flood hazard areas, including 100-year floodplains. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations. Those regulations enable FEMA to require municipalities participating in the NFIP to adopt certain flood hazard reduction standards for construction and development in 100-year floodplains. These standards are included below in Local Regulations.

The NFIP sometimes further divides the one percent annual chance floodplain on a river into a floodway and floodway fringe (FEMA, 2016). The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights (FEMA, 2016). The area between the floodway and the 100-year floodplain boundaries is termed the floodway fringe, which encompasses the portion of the floodplain that could be completely obstructed without increasing the water surface elevation (WSE) of the 100-year flood by more than 1 foot at any point (FEMA, 2016).

Pursuant to 44 CFR 60.3(d)(3), encroachments including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway are prohibited unless it has been demonstrated through hydrologic and hydraulic analyses that the encroachment would not result in any increase in flood levels. FEMA requires revisions to the Flood Insurance Rate Maps for encroachments into the floodway that cause base flood elevations to increase within the floodway. An application for a conditional letter of map revision must be filed with the Federal Insurance Administrator consistent with FEMA guidelines prior to floodway encroachment.

State Regulations

Porter-Cologne Water Quality Control Act

The State of California's Porter-Cologne Water Quality Control Act provides the basis for water quality regulation within California and assigns primary responsibility for the protection and enhancement of water quality to the California State Water Resources Control Board (SWRCB) and the nine RWQCBs. Under the Porter-Cologne Act, the SWRCB and RWQCBs also have the responsibility of granting CWA NPDES permits and Waste Discharge Requirements (WDRs) for certain point-source and non-point discharges to waters. The Porter-Cologne Act allows the SWRCB to adopt statewide Water Quality Control Plans and Basin Water Quality Control Plans, which serve as the legal, technical, and programmatic basis of water quality regulation statewide or for a particular region. The water quality control plans limit impacts on water quality from a variety of sources. The Basin Plan for the San Francisco Bay and the relevant permits are described below.

San Francisco Bay Water Quality Control Plan (Basin Plan)

San Francisco Bay waters are under the jurisdiction of the SFBRWQCB, which established regulatory standards and objectives for water quality in the Bay in the Water Quality Control Plan for the San Francisco Bay Basin, commonly referred to as the Basin Plan. The Basin Plan identifies existing and potential beneficial uses for surface and ground waters and provides numerical and narrative water quality objectives designed to protect those uses. The preparation and adoption of water quality control plans is required by the California Water Code (Section 13240) and supported by the federal CWA. Because beneficial uses, together with their corresponding water quality objectives, can be defined pursuant to federal regulations as water quality standards, the Basin Plan is a regulatory reference for meeting the state and federal requirements for water quality control. Adoption or revision of surface water standards is subject to the approval of the USEPA.

NPDES General Permit and Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (Order No. 2013-0001-DWQ)

In 2003, the SWRCB required small municipal storm drainage systems, including those in Marin, to be regulated under a statewide NPDES Small Municipal Separate Storm Sewer Systems (MS4s) General Permit. Areas that drain to separate stormwater collection systems, such as those within Marin County, were subject to this permit. The Marin County Stormwater Pollution Prevention Program (MCSTOPPP) Action Plan 2010 is the approved Storm Water Management Plan required under the 2003 MS4 permit. Each municipality complied with the 2003 MS4 permit by implementing Action Plan 2010 through a local stormwater program and through the collaborative efforts of MCSTOPPP (MCSTOPPP, 2013).

On February 5, 2013, the SWRCB adopted the General Permit for Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, Order No. 2013-001-DWQ (2013 MS4 permit; (SWRCB, 2013)). The 2013 MS4 permit modified the 2003 MS4 permit by establishing the storm water management program requirements in the Order and defining the minimum acceptable elements of the municipal storm water

management program (SWRCB, 2013). The required program includes specific elements related to program management, education and outreach on stormwater impacts, public involvement/ participation, illicit discharge detection and elimination, construction site stormwater runoff and control, pollution prevention/good housekeeping for permittee operations, post-construction stormwater management for new development and redevelopment, water quality monitoring requirements, program effectiveness assessment, and annual reporting. For renewal permittees such as Marin County, Fairfax, Ross, and San Anselmo, the guidance document must identify and describe Best Management Practices (BMPs) included in their previous Stormwater Management Plan that may be more protective of water quality than the minimum requirements of the updated permit, and identify whether the permittee proposes to maintain, reduce, or cease implementation of the BMPs.

NPDES General Permit for Discharges of Stormwater Associated with Construction Activities

The Construction General Permit (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ) regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb 1.0 or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines. This General Permit requires that storm water discharges and authorized non-storm water discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective or water quality standards (identified in the Basin Plan).

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific BMPs designed to prevent sediment and pollutants from contacting stormwater as well as non-storm water, and from moving offsite into receiving waters. The BMPs fall into several categories, including erosion control, sediment control, waste management and good housekeeping/site management practices. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

Receiving water risk is based on whether the project drains to a sediment-sensitive water body. A sediment-sensitive water body is one that appears on the most recent 303(d) list for water bodies as impaired for sediment, has a USEPA-approved TMDL implementation plan for sediment, or has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning. As shown in Table 3.9-4, while none of the water bodies near or downstream of the project sites are listed as impaired for sediment or have a TMDL implementation plan for sediment, Corte Madera Creek has the beneficial uses of cold freshwater habitat, fish migration,

and fish spawning and thus would be considered a sediment-sensitive water body under the Construction General Permit.

Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing and fueling. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In addition to stormwater discharges, the Construction General Permit also covers other non-stormwater discharges including irrigation of vegetative erosion control measures, water to control dust, uncontaminated ground water from dewatering, and other discharges not subject to a separate general NPDES permit adopted by the Regional Water Board. The discharge of non-storm water is authorized under the following conditions:

1. The discharge does not cause or contribute to a violation of any water quality standard;
2. The discharge does not violate any other provision of the General Permit;
3. The discharge is not prohibited by the applicable Basin Plan;
4. The discharger has included and implemented specific BMPs required by the General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment.
5. The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
6. The discharge is monitored and meets the applicable NALs; and
7. The discharger reports the sampling information in the Annual Report.

In the project area, the Construction General Permit is implemented and enforced by the San Francisco Bay RWQCB, which administers the stormwater permitting program. Dischargers are required to electronically submit a notice of intent (NOI) and permit registration documents (PRDs) in order to obtain coverage under this Construction General Permit. Dischargers are responsible for notifying the RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected. The risk assessment and SWPPP must be prepared by a state Qualified SWPPP Developer and implementation of the SWPPP must be overseen by a state Qualified SWPPP Practitioner. A Legally Responsible Person, who is legally authorized to sign and certify PRDs, is responsible for obtaining coverage under the permit.

Waste Discharge Requirements and Water Quality Certification for Stream Maintenance Program

The Flood Control District has an existing Water Quality Certification (Clean Water Act Section 401) and Waste Discharge Requirements issued by the RWQCB to permit actions associated with its Stream Maintenance Program (SMP; SMP; Order No. R2-2017-0028). The

SMP addresses actions necessary to continue providing flood protection and to maintain channel conveyance capacity while enhancing natural resources within subject streams. The routine management actions covered by this permit include sediment management, vegetation management, bank stabilization, and associated actions. This permit is renewed every 5 years, most recently in 2017. The details of the permit's terms and conditions come largely from the Marin County Stream Maintenance Program Manual, which can be revised as needed (subject to RWQCB approval) to add new streams or new activities. The five categories of maintenance actions covered are (1) vegetation management, (2) sediment and debris removal, (3) erosion control, (4) maintenance and repair of flood control structures, and (5) levee maintenance. These activities can occur in flood control channels, natural channels, and other facilities on an as-needed basis.

The permit includes certain limits on the extents of channels and the volumes of material that can be addressed in a given year. Those limits are as follows:

1. Maximum length of maintenance within a concrete engineered flood control channels is 2,800 contiguous linear feet;
2. Maximum length of maintenance within an earthen engineered flood control channel is 800 contiguous linear feet;
3. Maximum length of maintenance within a natural channel is 600 contiguous linear feet;
4. Maximum volume of debris or sediment removed from any site is 2,100 cubic yards.

These activities may not exceed a program wide cumulative annual total of 5,000 linear feet of creek channel and 11,000 cubic yards of sediment and debris. Over the Order's 5-year term, these activities may not exceed a program wide cumulative total of 25,000 linear feet and 55,000 cubic yards of sediment and debris. Exceptions to these limits may be approved by the RWQCB on a case-by-case basis.

Lake and Streambed Alternation Agreement for Routine Maintenance Activities

The District has an existing Lake and Streambed Alteration Agreement issued by CDFW under California Fish and Game Code Section 1602. This agreement/permit covers several categories of actions that are implemented regularly for ongoing flood control purposes. These activities are (1) vegetation management, (2) sediment and debris removal, (3) erosion control, (4) maintenance and repair of flood control structures, and (5) levee maintenance. Under this permit, the District develops an annual work plan for the necessary activities and submits it to CDFW with follow-up reporting on those activities actually performed. This permit is renewed every 5 years, most recently in 2016.

Regional and Local Regulations

Marin County Stormwater Pollution Prevention Program (MCSTOPPP)

In 1993 MCSTOPPP was created to prevent stormwater pollution, protect and enhance water quality in creeks and wetlands, preserve beneficial uses of local waterways, and comply with

State and federal regulations governing water quality. MCSTOPPP is composed of unincorporated Marin County, the Cities of Belvedere, Larkspur, Mill Valley, Novato, San Rafael, and Sausalito and the Towns of Corte Madera, Fairfax, Ross, San Anselmo, and Tiburon. The County's local stormwater program is responsible for implementing MCSTOPPP. The local stormwater program is administered by the Department of Public Works / County Flood Control Division staff in cooperation with the Community Development Agency, Environmental Health Services, and Parks and Open Space (Marin County, 2007b). Each MCSTOPPP member agency implements a local stormwater pollution prevention program and funds the countywide MCSTOPPP, which provide for the coordination and consistency of approaches between the local stormwater programs.

MCSTOPPP acts as a separate implementing entity to meet 2013 MS4 permit obligations on behalf of all the municipalities and the County. Under the 2013 MS4 permit, the participating municipalities must implement best management practices for operations and maintenance activities, implement stormwater pollution prevention plans at corporation yards, document the amounts of litter removed, and provide an adequate number of litter receptacles in commercial and other litter source areas. Permit requirements are implemented by the County and staff from municipalities. Permit requirements also include operations and maintenance best management practices that municipalities apply to their own operations, public education and staff training, water quality monitoring, stormwater control ordinances, construction site controls, postconstruction stormwater program, TMDL compliance tasks, and annual reporting (Marin County, 2020a). Marin County and the Town of Ross have adopted local stormwater runoff pollution prevention ordinances, as described below, which include BMPs that would apply to the project.

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County, 2007a).

Water Resources

Goal WR-1: Healthy Watersheds. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.

Goal WR-2: Clean Water. Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses.

> ***Policy WR-2.3 Avoid Erosion and Sedimentation***. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.

Implementing Program: WR-2.b Integrate Bay Area Stormwater Management Agencies Association (BASMAA) Stormwater Quality Protection Guidelines into Permitting Requirements for All Development and Construction Activities. All projects should integrate stormwater pollution prevention design features for water quality protection to the extent feasible, such as those included in the BASMAA Start-at-the-Source manual and the Tools Handbook.

The above-listed goals, policies, and implementing programs are implemented in the Marin County Code Chapter on Stormwater Pollution Prevention, discussed further below.

Marin County Code

In accordance with federal and state regulations, Marin County has adopted water quality standards applicable to areas within unincorporated Marin County.

Marin County Code Chapter 23.18, Stormwater Runoff Pollution Prevention

The intent of the chapter is to protect and enhance the water quality of Marin County's watercourses, water bodies and wetlands in a manner pursuant to and consistent with the Clean Water Act, the Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.), and the Phase II Small Municipal Separate Storm Sewer System (MS4) NPDES Permit, Water Quality Order No. 2013-0001-DWQ, General Permit No. CAS000004 (phase II stormwater permit) and subsequent revisions and amendments thereto.

The discharge of material other than stormwater to a county storm drain is prohibited. All discharges of material other than stormwater must be in compliance with a NPDES permit issued for the discharge. (Section 28.18.061) Any person engaged in activities which will or may result in pollutants entering a county storm drain shall undertake all practicable measures to cease such activities and/or eliminate or reduce such pollutants. Such activities include, but are not limited to, ownership, operation and/or use of parking lots, gasoline stations, industrial facilities, commercial facilities, construction activities, and stores. However, some discharges that could be generated during construction, such as uncontaminated pumped groundwater, diverted stream flows, and flows from riparian habitats and wetlands are exempt from this discharge prohibition provided any pollutants in the discharges are identified and appropriate control measures to minimize the impacts of such discharges are developed and implemented.

In particular, Section 28.18.093 of the County Code requires implementation of construction-phase best management practices designed to protect water quality as follows:

> Any person performing construction activities in the county shall implement appropriate BMPs to prevent the discharge of construction wastes, including soil or sediment, or contaminants from construction materials, tools and equipment from entering a county storm drain, watercourse, bay or ocean. In addition:
>
> 1. Construction-phase BMPs include erosion and sediment controls and pollution prevention practices. Erosion control BMPs may include, but are not limited to, scheduling and timing of grading (soil disturbing) activities,

timely revegetation of graded areas, the use of hydroseed and hydraulic mulches, and installation of erosion control blankets. Sediment control may include properly sized detention basins, dams, or filters to reduce entry of suspended sediment into the storm drain system and watercourses, and installation of construction entrances to prevent tracking of sediment onto adjacent streets. Pollution prevention practices may include designated washout areas or facilities, control of trash and recycled materials, covering of materials stored onsite, and proper location of and maintenance of temporary sanitary facilities. The combination of BMPs used, and their execution in the field, must be customized to the site using up-to-date standards and practices. The agency will provide references to current guidance manuals and BMP information on request.

2. Erosion and sediment control plan requirements.
   a. An erosion and sediment control plan (ESCP) shall be required for:
      i. Any project subject to a grading permit under Chapter 23.08, Excavating, Grading and Filling.
      ii. Any project subject to a building permit or other permit issued by the County that the agency determines has the potential for significant erosion and/or significant non-stormwater discharges of sediment and/or construction site waste.
   b. The ESCP shall comply with County Code Section 24.04.625 and shall include information required in the most recent version of the MCSTOPPP ESCP applicant package.

In addition, Section 23.18.095 of the County Code requires watercourse protection as follows:

> Every person owning, occupying, leasing, renting, or in control of the premises through which a watercourse passes shall: (A) keep and maintain that part of the watercourse within the property reasonably free of trash, debris, excessive vegetation, and other obstacles which would and/or could pollute or contaminate the flow of water through the watercourse; (B) maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function or physical integrity of the watercourse; and (C) not remove healthy native bank vegetation beyond that actually necessary for said maintenance, nor remove any vegetation in such a manner as to increase the vulnerability of the watercourse to erosion. No person shall commit or cause to be committed any of the following acts, unless a written permit has first been obtained from the agency:
>
> 1. Discharge into a watercourse;
> 2. Modify the natural flow of water in a watercourse;
> 3. Deposit in or remove any material from a watercourse, including its banks, except as required for necessary maintenance;

4. Construct, alter, enlarge, connect to, change or remove any structure in a watercourse; or
5. Place any loose or unconsolidated material within a watercourse or so close to the side so as to cause a probability of such material being carried away by storm waters.

Town of Ross General Plan

The following policies of the Ross General Plan related to hydrology and water quality are applicable to the project (Town of Ross, 2007).

Goal 1. An Abundance of Green and Healthy Natural Systems

1.1 Protection of Environmental Resources. Protect environmental resources, such as hillsides, ridgelines, creeks, drainage ways, trees and tree groves, threatened and endangered species habitat, riparian vegetation, cultural places, and other resources. These resources are unique in the planning area because of their scarcity, scientific value, aesthetic quality and cultural significance.

Goal 2. Sustainable Building and Community Practices.

2.2 Incorporation of Resource Conservation Measures. To the extent consistent with other design considerations, public and private projects should be designed to be efficient and innovative in their use of materials, site construction, and water irrigation standards for new landscaping to minimize resource consumption, including energy and water.

Goal 6. Protecting Creek Habitat and Reducing Flooding Hazards

6.2 Flood Control Improvements. The Town supports the construction of flood control improvements consistent with the natural environment, the design character of the Town of Ross and the safety and protection of persons and property.

6.3 Ross Valley Flood and Watershed Protection. The Town will work with other jurisdictions within the Ross Valley watershed to develop a comprehensive approach to flood protection and resource preservation strategies.

6.4 Runoff and Drainage. Stormwater runoff should be maintained in its natural path. Water should not be concentrated and flow onto adjacent property. Instead, runoff should be directed toward storm drains or, preferably to other areas where it can be retained, detained, and/or absorbed into the ground.

6.5 Permeable Surfaces. To the greatest extent possible, development should use permeable surfaces and other techniques to minimize runoff into underground drain systems and to allow water to percolate into the ground. Landscaped areas should be designed to provide potential runoff absorption and infiltration.

Town of Ross Municipal Code

The following policies of the Ross Municipal Code related to hydrology and water quality are applicable to the project (Town of Ross, 2020).

> **6.12.040 General--Storage and disposal.** It is unlawful for any person to keep, deposit, bury, burn or dispose of any solid waste, except as in this chapter is provided, in or upon any private property, public street, alley, sidewalk, gutter, park or upon the banks of or within any stream or creek in said town, or in or upon any of the waters thereof. Therefore, it is the intent of the town that every person residing or conducting business in this town shall dispose of solid waste only in the manner provided in this chapter. Nothing in this chapter shall prevent an owner and/or occupant of a residential or commercial premise from making occasional disposals at an authorized disposal site in addition to their regular weekly service, from utilizing a temporary debris box service, or from utilizing an employee or independent contractor to occasionally haul construction and/or demolition debris or for other occasional clean-up purposes consistent with Section 6.12.250. (Ord. 526 §1(part), 1994) (Town of Ross, 1994).
>
> **9.28.110 Refuse, trash and litter**. It is unlawful for any person to dump, deposit, or leave any bottles, broken glass, ashes, paper, boxes, cans, dirt, rubbish, waste, garbage, or refuse, or other trash. No such refuse or trash shall be placed in any waters in or contiguous to any park or recreation area, or left anywhere on the grounds thereof, but shall be placed in proper receptables provided for such purpose. Where receptacles are not so provided, all such refuse or trash shall be carried away from the park or recreation area by the person responsible for its presence, and properly disposed of elsewhere. (Ord. 266 §2 (part), 1967: prior code §4710) (Town of Ross, n.d.)
>
> **13.12.170 Pollution of water channels.** It is hereby declared to be a nuisance, and it is unlawful for any person to dump, put or place in, or on, or allow to run into, or on, any public reservoir, or the bank, border or margin, or into any water pipe, aqueduct, canal, stream, water, watercourse, or waterway within the town, any animal, vegetable, or mineral substance, or to do, perform or commit any act or thing which will pollute the purity and wholesomeness of any water or watercourse. (Ord. 496 §1(part), 1991) (Town of Ross, 1991).
>
> **13.16.010 Purpose**. The free and unobstructed flow of each and every creek, channel or watercourse in the town is essential to the proper drainage of the town and to the protection of life and property therein. Any weeds, trees, bushes, shrubs, brush, undergrowth, debris, or rubbish of any character or description which, at any time, interferes with the free and unobstructed flow of water in any creek, channel or watercourse constitutes a public nuisance and is subject to summary abatement, and/or abatement in accordance with Chapter 9.04. (Ord. 309 §2(part), 1970) (Town of Ross, 1970).

3.9.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist), the project would have a significant impact if it would:

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    i. result in substantial erosion or siltation on- or off-site;
    ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
    iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
    iv. impede or redirect flood flows;
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Given the nature of the project, impacts are analyzed in this section relative to the following additional threshold:

f. Expose people or property to flooding hazards

Approach to Impact Analysis

Overview

The following analysis discusses the potential impacts of the project related to changes in hydrology and water quality or other hydrology-related impacts in the project area. This section includes an analysis of potential short-term (construction) and long-term (operational) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are specified, as necessary, to reduce significant impacts.

Hydraulic Modeling

The floodplain analysis was completed based on the Ross Valley 1D/2D Unsteady-State Hydraulic Model ("Ross Valley Model" or "the model") jointly developed and calibrated by USACE and Stetson Engineers Inc. in 2017 and used in the previous USACE led EIR/EIS process for the Corte Madera Creek Flood Risk Management Project (USACE 2018). The floodplain

analysis is designed to analyze creek hydraulic and floodplain overland flow due to creek overtopping.

The Ross Valley Model was developed in USACE HEC-RAS v5.0 modeling software, by upgrading and merging two separate and previously developed models: the Lower Corte Madera Creek Model and the Upper Corte Madera Creek Model. The model was calibrated and verified by first calibrating to observed and recorded streamflow conditions from the December 15, 2016 bankfull event by adjusting the in-channel parameters that were used in setting up the model. The model was then calibrated to observed streamflows from the December 31, 2005 flood event by adjusting the floodplain parameters in the model. The model was also verified by comparing modelled results to actual flow conditions during the January 4, 1982 flood event. Calibration consisted of adjusting channel Manning's 'n', lateral weir flow coefficients, inline structure weir flow coefficients, or bridge/culvert modeling methods, all within reasonable ranges as specified in the HEC-RAS user's manual, until the model calculated WSEs matched the observed HWMs. The measured depths of sedimentation in the lower Unit 3 and Unit 2 concrete-lined channel were incorporated into the hydraulic modeling analysis as existing condition (USACE 2018).

Hydraulic models solve universally-accepted mathematical equations to simulate surface water movement across approximated topographic terrain. The solutions are approximations because a model cannot precisely quantify the spatially variable properties that exist in the real world. A reliable hydraulic model is one that can produce field-measured water levels and flow within an acceptable range of error. Error exists because information on the real-world system is always incomplete, and the field information that is available has associated errors (for example, measurement error). For all the three model calibration/verification events (i.e., December 15, 2016, December 31, 2005, and January 4, 1982), the differences between the model-simulated peak WSEs and the observed high water marks were well within the FEMA-required 0.5-foot range for most of the high water marks particularly at locations where high water marks were considered most reliable (see Appendix A of the U.S. Army Corps of Engineers Draft EIS/EIR (USACE, 2018)).

The following six scenarios were modeled:

1. Existing Condition Without Project
2. Existing Condition With Project
3. Future Condition Without Project
4. Future Condition With Project
5. Year 2100 Future Condition Without Project
6. Year 2100 Future Condition With Project

The existing condition without project reflects the current hydraulic conditions of Corte Madera Creek without construction of any planned or approved flood control projects. The existing condition with project reflects the existing condition model with all proposed project elements incorporated. The future condition without project reflects the hydraulic conditions of Corte Madera Creek with implementation of planned and/or approved projects listed in Table 3.9-5.

The future condition without project scenario also includes an intermediate level of sea level rise for 2067, as described below. Both the San Anselmo Flood Risk Reduction Project (projects 1, 3, and 7 in the table below) and Winship Bridge Project (project 8) are expected to be implemented concurrent with construction of the proposed project, as discussed further in Section 4.3 Cumulative Impacts. The remaining projects in Table 3.9-5 are anticipated to be implemented within 5 years. The future condition with project reflects the future condition model with all proposed project elements incorporated into the model. The approach to incorporating the project components into the model is described below. The Year 2100 future condition without project scenario includes all projects included in the future condition without project scenario and incorporates the CNRA predicted long-term sea level rise for year 2100. The future Year 2100 future condition with project scenario adds the proposed project elements to the Year 2100 future condition without project scenario.

Table 3.9-5 Projects Included in Future Condition Scenarios

No.	Project	Type	River/Creek	River Station (feet)
1	Sunnyside Nursery Site	New Detention Basin	Fairfax Creek	105+10
2	Azalea Avenue Bridge	Bridge Replacement		22+30
3	Building Bridge #2	Bridge Removal	Corte Madera Creek	434+52
4	Madrone Avenue Bridge	Bridge Replacement		449+49
5	Nokomis Avenue Bridge	Bridge Replacement		454+77
6	Sycamore Avenue/Center Boulevard Bridge	Bridge Replacement		440+05
7	Bridge Avenue Bridge	Bridge Replacement		438+00
8	Winship Avenue Bridge	Bridge Replacement		405+38

Sources: (USACE, 2018)

The existing condition without project and future condition without project scenarios were based on the Ross Valley Model developed in 2017. The existing condition with project, future condition with project, and Year 2100 future condition with project scenarios are developed as a part of this EIR analysis, based on the Ross Valley Model, with several revisions made specifically to the project components. The revisions include channel geometry updates to reflect the proposed project analyzed in the EIR, selection of hydraulic roughness, and updates to the Manning's 'n' factor to reflect the Frederick Allen Park floodplain improvements. The following adjustments were made to the model to reflect the post-project conditions:

- Unit 4
  - Cross section geometries were adjusted to reflect the proposed Unit 4 design concept, between Corte Madera Creek Stations 37051 and 36970
- Unit 3

  - Removal of the existing fish ladder inline structure and associated model cross sections
  - Cross section geometry adjustments to the cross sections representing the Frederick Allen Park project component concept design
  - Updated cross section Manning's "n" values along Frederick Allen Park project component to represent natural channel bottom and creek banks
  - Floodwall added along the left and right bank of Allen Park. The top of floodwall elevations were adjusted to a height of 1 foot above the 25-year design event WSE
  - Floodwall added on left bank adjacent to Granton Park, between Stations 35700 and 34500. The top of floodwall elevations were adjusted to a height of 1 foot above the 25-year design event WSE
  - Floodwall added to the left bank downstream of the College Avenue Bridge, between Stations 33476 and 32500. The top of floodwall elevations were adjusted to a height of 1 foot above the 25-year design event WSE
  - Short floodwall added on left overbank area upstream of College Avenue Bridge
  - Manning's "n" roughness coefficients adjusted in concrete channel to reflect the approximate roughness associated with the proposed fish pools
- Unit 2
  - Cross section geometries were adjusted to reflect the proposed Unit 2 design at the mouth of the concrete channel, between Stations 32291 and 31810

The existing condition without project, existing condition with project, future condition without project, future condition with project, Year 2100 future condition without project, and Year 2100 future condition with project scenarios was modeled for the following three flood recurrence intervals:

1. 10-year
2. 25-year
3. 100-year

Sea Level Rise

Sea level rise projections developed for the future condition without project and future condition with project analysis are based on procedures prescribed by Engineering Regulation (ER) 1100-2-8162, Incorporating Sea Level Change in Civil Works Programs (USACE, 2013). The geographically closest and most suitable NOAA tide gage for establishing relative sea level change (SLC) trends for the project area is the San Francisco, CA, NOAA tide gage, Station ID: 9414290. The San Francisco tide gage has a 110-year period of record and has been referenced to NAVD88. The USACE Sea-Level Change Curve Calculator's intermediate sea level change of about 1 foot (from 1992, the last NTDE, to 2067) was used in modeling of the future without project and future with project conditions. With the mean higher-high water level of 6.65 feet at the San Francisco Gage, the estimated coastal water level in 2067 is 7.65 feet (USACE 2018). An additional sea level rise scenario is included in the impact analysis to evaluate future conditions

in year 2100, with projected sea level rise based on the 2018 Update of the State of California Sea-Level Rise Guidance (CNRA 2018), under the high emission likely scenario. The estimated coastal water level at 2100 is 10.05 feet. Additional information on how sea level rise was incorporated into the future condition modeling can be found in Appendix A of the U.S. Army Corps of Engineers Draft EIS/EIR (USACE, 2018)).

Erosion and Sediment Deposition

Impacts to sediment transport and potential resulting sedimentation or erosion were analyzed by evaluating changes in velocity, channel material, and channel cross-sectional area. Increases in velocity when "with project" scenarios are compared to "without project" scenarios, could indicate an increase in sediment transport capability as well as increased potential for scour or erosion, while potential future decreases in velocities relative to current conditions could facilitate sediment deposition and decrease the potential for erosion and scour.

Channel materials vary in terms of susceptibility to erosion, with earthen material being much less resistant than concrete. For earthen streambanks and the streambed, clay dominated sediment or soils tends to be more cohesive and less erosive than sand dominated sediment, but these sensitivities to erosion are also influenced by local site conditions as well as the hydraulic forces during streamflow. For earthen stream surfaces, the presence of vegetation or erosion controls can provide some protection to lessen the risk or effect of erosion. Changes and transitions in channel cross-sectional areas can influence sediment transport in alluvial channels (non-bedrock channels built into sediment that the creek formerly deposited). For the same discharge volume, a larger cross-sectional area results in lower streamflow velocity and potentially a more depositional environment and conversely a smaller cross-sectional area with the same discharge rate results in higher streamflow velocity and potentially a more erosive environment. In a transition where the channel widens, velocities lessen, and the tendency is for that transition to be more depositional. However, sometimes local eddy effects can create localized sideboard scour at the streambanks immediately downstream of the transition to a wider channel. Conversely, in a transition to a narrower channel, velocities will typically increase and the reach downstream of the narrowing transition can be more erosive or incisional.

Impact Analysis Methods

For this impact analysis baseline conditions and potential impacts were based on conditions at the time the Notice of Preparation (NOP) was published (August 2020). Impacts were also evaluated for future conditions that reflect sea level rise of 1 foot and implementation of the projects in Table 3.9-5 as described above. The approach to use of both an existing condition and future condition analysis is consistent with CEQA Guidelines Section 15125(a)(1). The future condition baseline is provided because the use of the existing conditions baseline at the time of the NOP alone would be misleading in that it does not include information for upstream projects that have been planned or approved and would be constructed in the near future (see Table 3.9-5) and sea level rise, which has been raised as a concern in public comments. These future projects would affect the baseline hydraulic conditions of Corte Madera Creek at the time or shortly after the proposed project becomes operational because the planned or approved

future projects are located upstream on Corte Madera Creek and will affect the hydrology of Corte Madera Creeks as the planned and approved upstream projects have been designed to provide flood risk reduction to communities upstream of the project area. Sea level rise will affect the limits of high tide within Corte Madera Creek in the project area, which changes the future hydrologic conditions of the creek within the project area.

The impact analysis for floodplain inundation due to creek overtopping considers both the changes in velocity and WSE at the 10-year, 25-year, and 100-year recurrence interval under the existing conditions, and future conditions when the planned and approved upstream flood control projects have been constructed. The future condition scenario also addresses sea level rise as noted above. Because sea level rise will result in changes to the future environmental conditions that affects the hydraulic conditions in Corte Madera Creek, sea level rise has been incorporated into the future condition assessment to support the evaluation of project impacts on that future condition. Additional information on sea level rise can be found on the preceding page and in Appendix A of the U.S. Army Corps of Engineers Draft EIS/EIR (USACE, 2018).

Given limitations in model precision as discussed under hydraulic modeling above, a threshold of 0.2 feet (2.4 inches) was used for determining whether there was a potentially significant increase or decrease in WSE in the impact discussion below. The 0.2-foot threshold is a reasonable level of precision for evaluating flooding impacts considering the standards for accuracy and precision associated with a hydraulic model like the one used to evaluate the proposed project. During the project design process, the hydraulic model will be refined and updated to improve the accuracy in predicting the change in WSE.

3.9.6 Impact Discussion

Impacts Avoided

Due to the nature of the project, potential impacts to the criteria described below would not occur; therefore, further impact discussion is not provided as described below:

1. **Criterion (b):** The project would not utilize groundwater or generate an increase in impervious surfaces. Much of the channel in the project area is concrete allowing for little to no infiltration. The project may provide a slight increase in groundwater infiltration; however, the effect would be nominal since flows would likely be conveyed through the concrete portion of the channel most of the year and soils would already be saturated during flood events when the floodplain was activated.

Impact Analyzed

Impact Analyzed	Significance Determination
Impact 3.9-1: The project could violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality; or result in discharge of pollutants into surface or ground waters or other alteration of surface or ground water quality (e.g., temperature, dissolved oxygen or turbidity).	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant with Mitigation

Construction

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

The proposed work in Unit 4 extends from approximately 150 feet upstream of the Lagunitas Road Bridge to Unit 3 at Frederick Allen Park. The improvements include the removal of the existing fish ladder, grading within the channel and banks to increase hydraulic capacity and transition to the Allen Park improvements, and channel stabilization measures including planted rock, vegetated soil lifts, erosion control fabric, and engineered streambed material directly upstream of the removed fish ladder. Concrete will be installed at the transition to Unit 3. The improvements also include riprap and short cast-in-place concrete walls adjacent to existing concrete walls to reinforce those walls.

Removal of the fish ladder and grading the channel and banks would expose loose sediment and soils to precipitation, overland flows, and stream flows. The use of construction equipment in the channel has the potential for accidental release of petrochemicals and lubricants that could later spread following precipitation runoff or stream flows.

During construction, Unit 4 will be dewatered using a temporary diversion system to divert flows via pipe to the channel downstream of the work area (Appendix D). Channel stabilization measures including planted rock, vegetated soil lifts, erosion control fabric, engineered streambed material, concrete retaining walls, and a concrete apron where the fish ladder will be removed will be implemented to stabilize sediment and soils and help to prevent undesired erosion and sediment transport.

Compliance with the Construction General Permit, including preparation and implementation of the SWPPP and associated BMPs as well as inspection and reporting, would effectively reduce degradation of surface water quality to a less-than significant level. Adherence to these requirements would also effectively reduce potential impacts associated with spills or leaks of hazardous materials and stormwater quality during construction. Thus, construction of this element would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant.

Unit 3 Frederick Allen Park

The Frederick Allen Park improvements include removing the existing concrete-lined flood control channel, constructing new retaining walls adjacent to the transition from Unit 4, 2-foot-tall concrete flood walls on top of both banks, and excavating and grading the channel, streambanks, and floodplain to widen the channel and create a natural floodplain. The

improvements also include revegetating the area with riparian species and new landscaping (see planting plans in Appendix B), realigning Bike Route 20 within the park, and creating new pedestrian access to the creek. The floodwalls are anticipated to be cast-in-place free-standing walls.

Removal of the concrete channel and excavation, tree removal, and grading within the channel and existing park would expose loose sediment and soils to precipitation, overland flows, and stream flows. The use of construction equipment in the channel has the potential to cause an accidental release of hazard materials that could later spread following precipitation, runoff, or stream flows.

During construction, upper Unit 3 will be dewatered from the location of the existing fish ladder to the Kentfield Hospital Bridge (freshwater reach of Corte Madera Creek). Slope and channel stabilization measures including planted trees and shrubs, erosion control fabric, seeding, willow stakes, planted rock, retaining walls, concrete, and engineered streambed material will be installed to stabilize sediment and soils and help to prevent undesired erosion and sediment transport. Paving of the relocated Bike Route 20 multi-use pathway will also stabilize exposed soil in the project area.

Compliance with the Construction General Permit, including preparation and implementation of the SWPPP and associated BMPs as well as inspection and reporting, would effectively reduce the potential degradation of surface water quality to a less-than significant level. Adherence to these requirements would also effectively reduce potential impacts associated with spills or leaks of hazardous materials and stormwater quality during construction. Thus, construction of this element would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant.

Unit 3 Fish Pools, Granton Park Floodwall and Unit 2 Floodwall, and Stormwater Pump Station

The proposed work within the lower reach of Unit 3 and upper Unit 2 includes the construction or enhancement of up to 12 fish pools within the channel, constructing new 2- to 4-foot-tall floodwalls along the left bank that would either be attached to the existing floodwall or setback from the floodwall at the edge of District property, depending on USACE Section 408 authorization. The USACE may also require removal of trees within 15 feet of the existing floodwall and up to the limits of District property as part of the Section 408 authorization. The USACE has the authority to require removal of trees within 15 feet of the existing floodwall in the absence of the project. The project also includes a stormwater pump station at Laurel Avenue, adjacent to the channel's left bank. Construction of the floodwalls and pump station would temporarily expose loose soil; however, when completed, these structures would cover much of the exposed soil. Remaining disturbed areas would be revegetated to the extent allowed by the USACE. Construction or enhancement of fish pools would involve dewatering and bypass pumping to facilitate construction. Pools would be formed by removing existing concrete, excavating the pool, and installing new concrete to line the pool. Excavated concrete

and sediment would be removed from the channel. Although the channel and banks are concrete through this reach, the use of construction equipment has the potential to cause accidental release of hazardous materials in and around the channel and may contaminate soils under the existing concrete channel exposed during pool, floodwall, and stormwater pump station construction.

As mentioned in the elements above, compliance with the Construction General Permit and implementations of the SWPPP and associated BMPs would reduce the potential degradation of surface water quality and potential impacts from construction-related spills or leaks. Therefore, construction of this element would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant.

Unit 2 Lower College of Marin Concrete Channel Removal

The ~~l~~Lower College of Marin Project ~~concrete channel removal~~ will involve ~~the~~ removal of portions of the concrete-lined flood control channel walls downstream ~~of~~ from Stadium Way to restore natural creek function and create tidal and wetland habitat. The removal of trees and concrete in this unit will expose sediment and dirt to runoff, stream flows, and tidal action. The use of equipment in the channel and accidental release of hazardous materials has the potential to contaminate soil and sediments that would later spread following precipitation, runoff, or stream and tidal flows.

Much of the exposed area will be revegetated with native vegetation; however, re-exposed channel sediments could be mobilized during tidal flows. The Unit 2 concrete channel removal project area is within the tidal influence of the San Francisco Bay. The Central San Francisco Bay is listed on the 303(d) list for mercury, PCBs, furan compounds, dioxin compounds, pesticides, and other contaminants. Sediments that would be excavated and exposed during construction could potentially be contaminated due to existing known contaminants in the San Francisco Bay, and the construction could result in transport of sediments and associated pollutants into San Francisco Bay. The transport of contaminated sediment to San Francisco Bay would be a significant impact. Soil testing was performed on samples from borings in the Lower College of Marin Project's concrete removal area (Geomorph Design Group, 2020). The soil samples were tested for heavy metals (CAM 17 metals), TPH (gas, diesel, and motor oil), semi-volatile organic compounds and PCBs. No hazardous materials were detected in the samples, and the soil contaminants are within the standard background levels for Marin County. ~~The implementation of **Mitigation Measure 3.9-1: Conduct Soil/Sediment Testing**, would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized.~~

As mentioned in the analysis of the other project elements construction above, compliance with the Construction General Permit and implementations of the SWPPP and associated BMPs would reduce the potential degradation of surface water quality and potential impacts from construction-related spills or leaks. Therefore, with the implementation of the SWPPP~~,~~ and associated BMPs~~, and Mitigation Measure 3.9-1, construction of~~ the ~~l~~Lower College of Marin

concrete channel removal would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant ~~with the application of the prescribed mitigation measure~~.

Operation and Maintenance

Maintenance of the proposed project will include routine vegetation management, sediment and debris removal, and annual inspection and maintenance of the floodwalls and structures. Vegetation management would likely occur annually or on an as-needed basis and would not include ground-disturbing activities and would employ hand tools, thus minimizing risks of water quality impacts from spills or equipment leaks in the channel or erosion from disturbed soils. Debris and sediment would be removed from Corte Madera Creek as needed, and the frequency of debris and sediment removal and inspections would be similar to the existing maintenance of the concrete channel. The District's routine maintenance activities on Corte Madera Creek are addressed in the Marin County Flood Control Stream Maintenance Program, which was previously evaluated under CEQA and approved by the District in 2012. Maintenance of the proposed project would be consistent with the activities and impacts addressed in the previously authorized Marin County Flood Control Stream Maintenance Program. The impact discussion below focuses on operational impacts of the project.

Unit 4

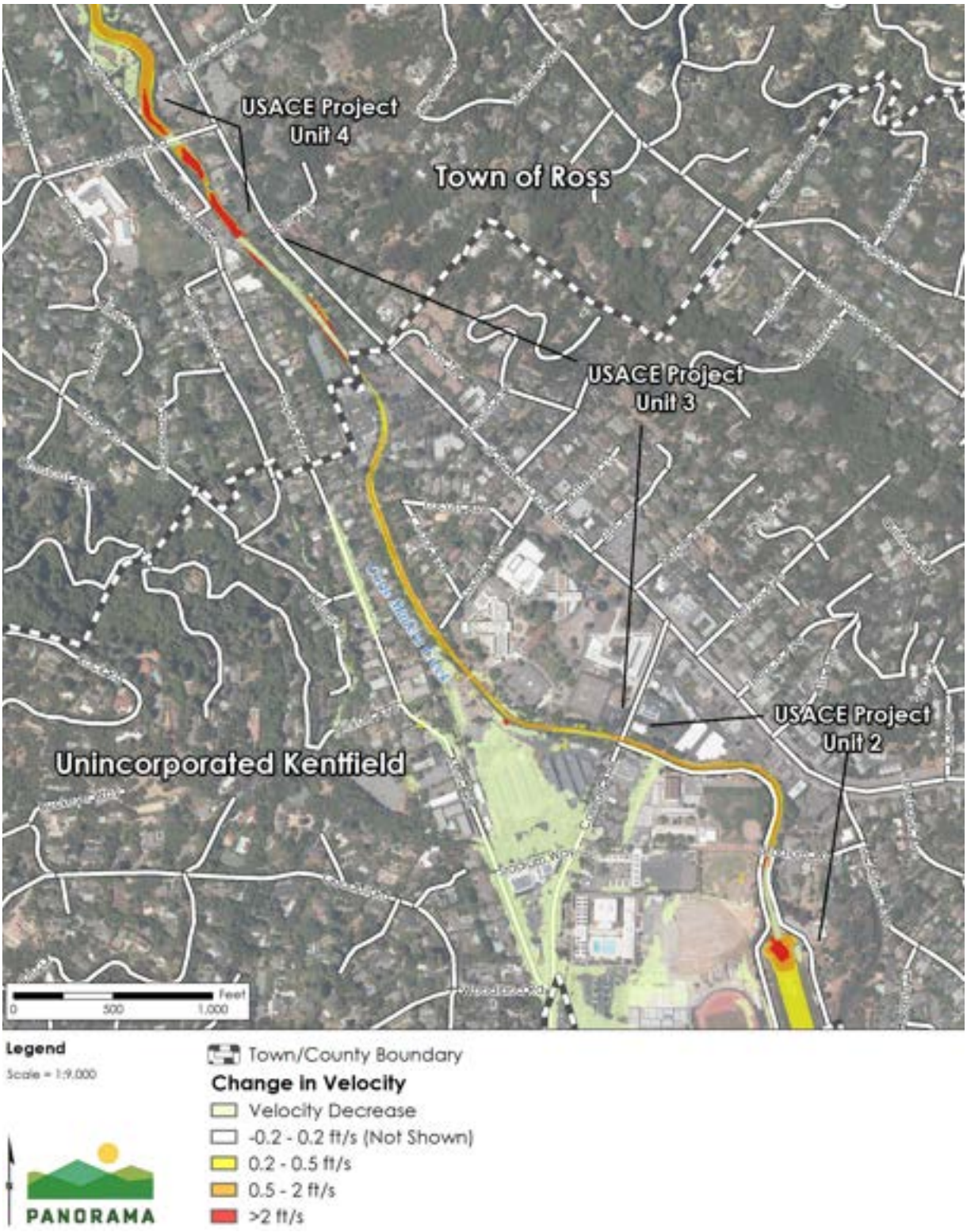
The project change in flow velocity under existing conditions is shown in Attachment E. As shown in Figure 3.9-4 through Figure 3.9-6, the project would increase flow velocities in the channel through most of Unit 4, while decreasing velocities around Lagunitas Road Bridge. Since velocity increases of 2 to 4 feet/second (increase of 20 to 50 percent) would occur throughout much of this unit compared to the no project conditions, the project designs include multiple elements to reduce erosion potential. The area of the removed Denil fish ladder at the transition between Unit 4 and Unit 3 will be stabilized with a concrete apron to prevent erosion and protect the buried Ross Valley Sanitary District pipeline. Segment of the new channel upstream of the removed fish ladder would be widened and provide a smooth grade transition that would support long term channel stability and reduce erosion potential. Site-specific creek-bank toe protection and bank stabilization will be installed in areas determined to be at increased risk of erosion or scour. Creek-toe protection may include a new buried rock keyway, bioengineered stabilization using willows and other native planting, and reinforced concrete wall. Additional as-needed channel stabilization and reinforcement would include installation of erosion-control fabric and engineered streambed material. The improvements would provide long-term streambank stabilization and erosion control in Unit 4. The project would not contribute to violation of water quality standards or result in increased discharge of pollutants during the operational period because long-term sediment control is incorporated into the project design. The impact would be less than significant.

Unit 3 Frederick Allen Park

The project design in Frederick Allen Park includes retaining walls and a paved multi-use path to provide permanent soil stabilization within the area. Vegetation would be planted in proximity to the creek and would provide shade for the creek. The increased riparian vegetation

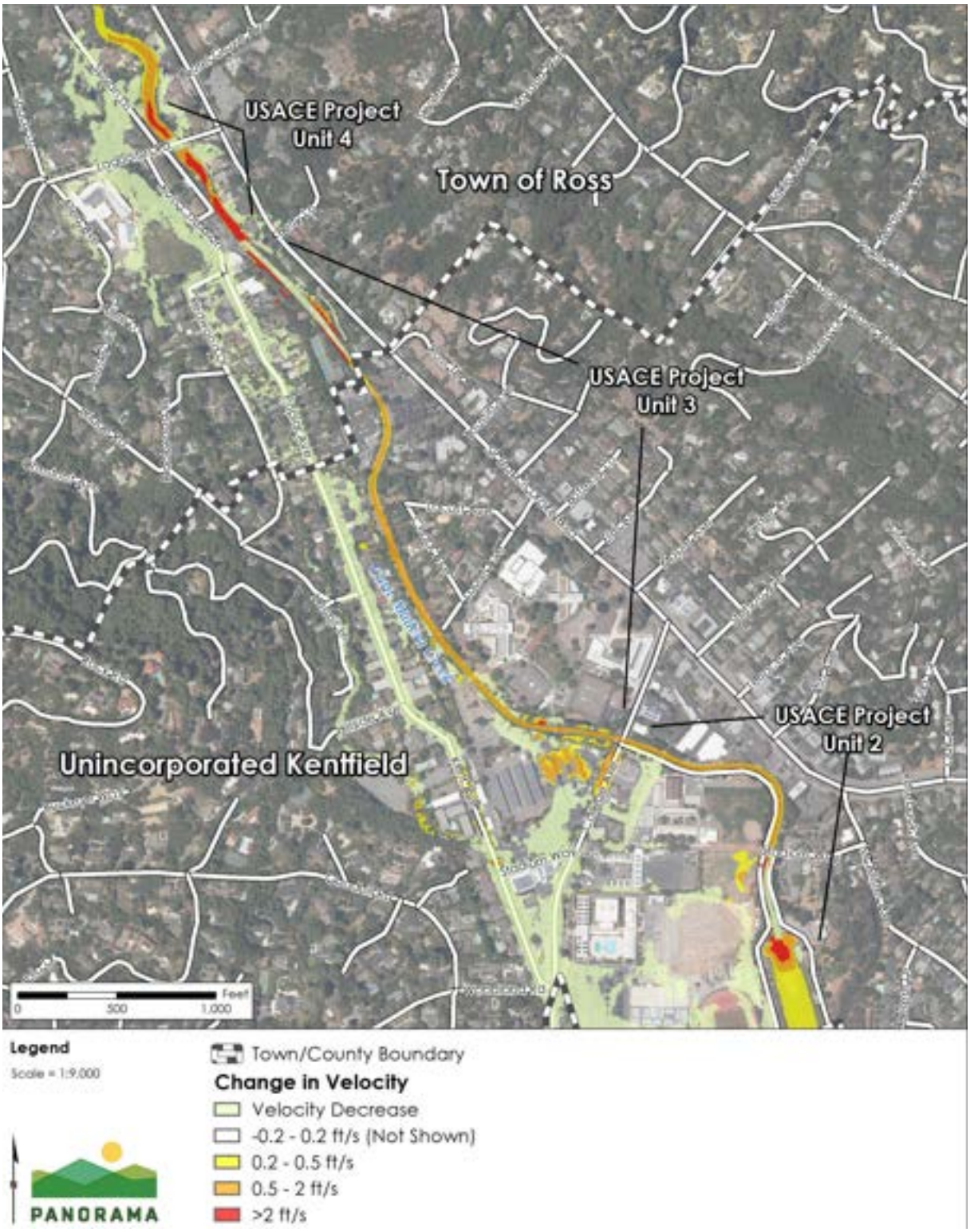
and shading of the creek would have a beneficial impact on water quality because the vegetation would provide nutrient retention benefits and the temperature in the natural shaded channel would be less than the existing concrete-lined channel. A split-rail fence would be installed near the multi-use path to prevent encroachment into the habitat areas during the vegetation establishment period. A new access to the creek would be provided from the low point in the multi-use path. The new creek access would allow for pedestrian access only and signs would be placed to educate the public about the habitat and creek and discourage littering and off trail access into habitat areas. The public educational signage and placement of trash receptacles would reduce the risk of water quality impacts from erosion and trash to a less--than-significant level. The removal of the concrete channel, grading of the floodplain and streambanks, and removal of trees in the Frederick Allen Park area will expose soils to overland flows and flood flows, increasing the risk of erosion in the newly disturbed areas. The potential for erosion due to changes in flood elevations and velocities is discussed in further detail in Impact 3.9-2 below, however widening the channel cross-sectional form and constructing instream benches at Frederick Allen Park is anticipated to decrease relative water velocities on vegetated or unarmored slopes, thereby decreasing the risk of erosion to a less-than-significant level. However, soil and sediment erosion could potentially increase turbidity or transportation of pollutants if eroded soils are contaminated. The potential increase in turbidity or transportation of pollutants from soils that could be contaminated is considered a significant impact to downstream water quality. Implementation of Mitigation Measure 3.9-1 would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized during construction. Therefore, with the implementation of Mitigation Measures 3.9-1 the Frederick Allen Park modifications would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant with mitigation.

Figure 3.9-4 Project Changes in Velocity from Future Conditions, 10-Year Flood Event



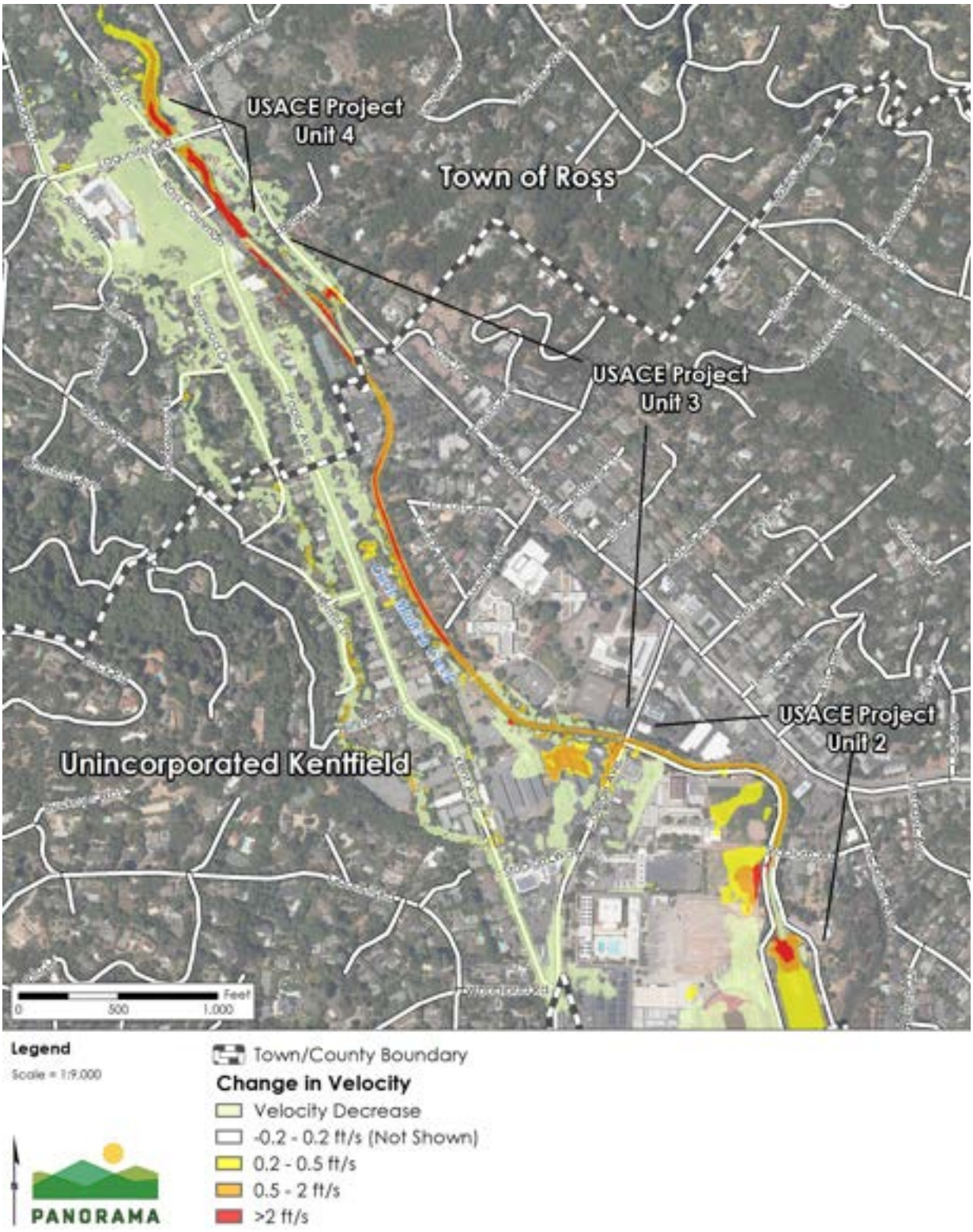
Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure 3.9-5 Project Changes in Velocity from Future Conditions, 25-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure 3.9-6 Project Changes in Velocity from Future Conditions, 100-Year Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Unit 3 Fish Pools, Granton Park Floodwall and Stormwater Pump Station, and Unit 2 College of Marin Floodwall

The Unit 3 fish pools would be lined with concrete to provide the structural integrity needed for the fish pools and the concrete channel and seal the pool from groundwater. The concrete-lined fish pools would not create an increased risk of sedimentation and would have no long-term impact on water quality. The floodwalls in Units 3 and 2 will be concrete and would not be at risk of erosion. The floodwalls in Units 3 and 2 may require permanent tree removal to comply with USACE Section 408 requirements. USACE has the authority to require removal of trees within 15 feet of the existing floodwall. If USACE requires tree removal, the roots and stump of the tree would remain in place and the tree removal would not create a significant source of erosion or other impacts on water quality. The pump station would be stabilized with concrete and gravel and would not cause a significant water quality impact. The impact on water quality would be less than significant.

Unit 2 Lower College of Marin Concrete Channel Removal ~~Corte Madera Creek (Phase 2)~~

The Unit 2 lower College of Marin concrete channel removal and restoration is being designed to be a natural, self-maintaining creek ecosystem, resilient to sea-level rise and climate change. Minimal routine maintenance is anticipated. In the event unforeseen maintenance is required, such as to address storm flow debris, washed up boats, or other man-made debris in the area that affects the natural function of the habitat, the District would conduct maintenance activities consistent with the existing District maintenance program.

Following concrete removal, much of the exposed area will be revegetated with native vegetation. However re-exposed channel sediments along the lower banks and streambed could be mobilized during ~~tidal flows or~~ flood events and tidal conditions, possibly building up fine sediment deposition in the reach that could be mobilized during daily tidal cycles, potentially increasing turbidity and transporting associated pollutants into San Francisco Bay. As discussed above, soil sampling in the Lower College of Marin area concluded that the soils are not hazardous, and the proposed project would not expose contaminated soil and sediment. ~~Implementation of Mitigation Measure 3.9-1 would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized during construction.~~ In addition, site-specific bank protection will be installed in areas determined to be at increased risk of erosion or scour and creation and enhancement of vegetated tidal habitat would minimize the risk of erosion and increased turbidity to a less than significant level. Therefore, ~~with the implementation of Mitigation Measures 3.9-1,~~ operation and maintenance in this element would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant ~~with mitigation~~.

> **Mitigation:** Implement Mitigation Measure 3.9-1.
>
> **Mitigation Measure 3.9-1:** Conduct Soil/Sediment Testing. Excavated and exposed soil and sediment at risk of erosion or mobilization will be tested for contaminants of potential concern (COPCs) for concentrations above SFBRWQCB's Environmental

Screening Levels (ESLs) for shallow soils, where groundwater is not a drinking water source, for commercial land use. Additional sampling results shall be compared to the Total Threshold Limit Concentrations (TTLCs) specified in California Code of Regulations (CCR) Title 22 Chapter 11 for hazardous waste identification. Soils will be tested prior to initiation of excavation activities to determine appropriate treatment, storage, and suitability for on-site onsite reuse, landfill disposal, or hazardous waste disposal.

Significance after Mitigation: Mitigation Measures 3.9-1 would reduce the potential impact on water quality to less than significant by requiring testing of soils and sediment at risk of erosion or mobilization and removal or immobilization of any soils found to be over applicable water quality standards.

Impact 3.9-2: The project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: **i. result in substantial erosion or siltation on- or off-site;** **ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;** **iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or** iv. **impede or redirect flood flows.**	**Significance Determination** **Construction: Less than Significant** **Operation and Maintenance: Less than Significant**

Construction

Erosion and Siltation (i)

In-channel construction would occur during the dry season when creek flows would be lowest. During construction, remaining surface flows would be diverted around areas of active construction, minimizing potential erosion during construction activities.

Immediately following construction dry-season flows would come in contact with the recently graded bed and constructed earthen streambanks in Unit 4 and Frederick Allen Park. However, channel stabilization measures implemented during construction including planted rock, vegetated soil lifts, erosion-control fabric, and engineered streambed material in these units would decrease the risk of erosion immediately following construction to a less than significant level.

The enlarged fish pools in the concrete-lined flood control channel in Unit 3 will be lined with concrete to prevent groundwater infiltration. The fish pools and existing concrete channel

would not be subject to erosion or siltation during or immediately following construction because no sediment would be exposed to erosion or siltation.

During construction, Unit 2 will be dewatered using a temporary berm and sheet wall with upstream flows diverted around the work area. Immediately following construction, recently exposed soil and sediment in a portion of the channel will be exposed to dry season flows and tidal influence. Newly exposed earthen banks will be revegetated while, the streambed and intertidal mudflats will remain unvegetated. Given the channel slope, increased cross-sectional channel width, and low elevation relative to sea level, fluvial processes in Unit 2 are anticipated to be depositional as tidal action becomes the primary geomorphic process, similar to existing conditions. The impact would be less than significant.

Runoff and Flood Flows (ii), (iii), (iv)
In-channel construction would occur during the dry season when creek flows would be lowest. Therefore, construction of the project would not result in substantial changes in runoff. Temporary dewatering and diversion activities would be finished prior to wet season flows and would not impede or redirect flood flows. Therefore, construction of the project would not substantially alter the existing drainage pattern of the area in a manner that would result in substantial water quality or hydrological impacts. The impact would be less than significant.

Operation and Maintenance
Erosion or Siltation (i)
The project would alter flow velocities along much of the channel during high flow events as shown in Figure 3.9-4 through Figure 3.9-6. Increased flow velocities could potentially increase erosion in creek sections lacking streambank or bed protection or where existing channel protection is removed. As such, project designs include toe protection and scour protection in areas identified as potentially at risk of erosion.

As mentioned in Impact 3.9-1, the project would increase flow velocities in the channel through most of Unit 4, while decreasing velocities around Lagunitas Road Bridge. Since velocity increases of 2 to 4 feet/second (increase of 20 to 50 percent) throughout much of this unit, project designs include multiple elements to increase bank and bed stability and reduce erosion potential due to increases in streamflow velocity.

In the Frederick Allen Park portion of Unit 3, velocity decreases of 3 to 8 feet/second (increase of 20 to 50 percent) would occur due to the much wider channel cross section and increased roughness. Given the change from concrete to earthen channel here, this decrease in flow velocity is anticipated to be proportionate to the reduced channel sheer strength and neutral in respect to sediment transport conditions within the Frederick Allen Park portion of Unit 3.

In the downstream portion of Unit 3, flow velocities would generally increase slightly by 0 to 2 feet/second (increase of 0 to 20 percent). Since this portion of Unit 3 is a concrete channel, these increases would not increase the potential for erosion, and sediment deposition rates would be unaffected or decrease as compared to existing conditions in this portion of the creek. Similarly, the upstream portion of Unit 2, which is also a concrete channel, would experience

slight increases in velocity (0.5 to 0.75 feet/second, equivalent increase of 5 to 10 percent) with little change in erosion or siltation potential.

In Unit 2 downstream of Stadium Way, streamflow velocity would decrease resulting from the expanded cross-sectional area of the channel, while improved flood containment would increase streamflow volume, by keeping flows that previously would have gone overbank now in the channel, resulting in greater instream flows. This increase in streamflow volume translates in the hydraulic model as an increase in flow velocity at the transition from the existing concrete channel to an earthen channel, as shown on Figure 3.9-4 through Figure 3.9-6. However, since tidal processes are the primary hydrological driver in this reach, actual flow dynamics in the lower portion of Unit 2 are anticipated to be comparable to existing conditions. In addition, the proposed project design gradually expands the channel cross-sectional from 32 feet to 180 feet (approximate) over a distance of 625 linear feet (approximate) as compared to existing conditions where the channel expands from 32 feet to 180 feet over 85 linear feet (approximate). This elongated, more gradual increase in channel width would lower the potential for eddying and subsequent bank erosion at the point of expansion. Considering the tidal flow regime, low gradient channel slope, and increased channel cross-sectional area, the erosion or siltation potential in the lower portion of Unit 2 is anticipated to be comparable to existing conditions during project operation. The impact on erosion and siltation would be beneficial and less than significant.

Surface Runoff and Stormwater Drainage (ii) and (iii)

The project involves removal of concrete in Frederick Allen Park and at lower College of Marin in Unit 2. The removal of impervious surfaces and replacement with riparian and marsh habitat would reduce surface runoff and have a beneficial effect by reducing runoff. The project includes installation of a stormwater pump station that would have a beneficial effect on the stormwater drainage system. The project would not generate substantial additional sources of polluted run-off as discussed in Impact 3.9-1 above. The impact would be beneficial and less than significant.

Impede or Redirect Flood Flows (iv)

The project involves modification to the USACE constructed concrete-lined flood control channel and installation of a stormwater pump station and floodwalls to redirect flood flows into Corte Madera Creek and reduce flooding in residential areas. The changes in WSE in the areas surrounding the project are shown in Figure 3.9-7 through Figure 3.9-9. In general, the project will decrease flooding in portions of Ross and Kentfield, while leading to slight increases in flood elevations in small areas around the College of Marin, specifically the College of Marin parking lot. Flood inundation would not occur in any areas not already inundated during the 100-year event.

The Frederick Allen Park project component would also increase the conveyance capacity of the channel by removing the current channel constriction at the Denil fish ladder. Thus, while the project would redirect flood flows from residential areas to Corte Madera Creek, the impact from redirection of flood flows from residential areas to the creek channel would be beneficial and the impact would be less than significant.

Mitigation: None required.

Impact 3.9-3: The project would not risk release of pollutants as a result of project inundation due to tsunami	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

The Unit 2 concrete channel removal area is in a designated tsunami inundation area, as shown on Figure 3.9-3. Construction activities would occur within the tsunami inundation area during concrete removal, channel grading, and habitat enhancement activities. In-channel construction would occur over a six-week period from September 1 to October 15. However, it is extremely unlikely that a tsunami would affect the project area during the six-week construction period for several reasons. Tsunamis rarely affect California with only 76 recorded events over a 200-year period (1812-2012) with a wave height exceeding 1 meter (CDOC 2021). Tsunamis cannot originate from San Francisco Bay as regional faults are transform (horizontal) faults that do not cause the displacement necessary to result in a tsunami. The effects of tsunamis originating in the Pacific Ocean are significantly dampened by regional topography, specifically the 1-mile-wide constriction at the Golden Gate, the Tiburon Peninsula, and Angel Island. In addition, the project does not increase the potential to cause a tsunami nor increase the wave amplitude if one occurred. Therefore, the risk release of pollutants as a result of project inundation due to tsunami would be less than significant.

Operation and Maintenance

Unit 2 is subject to daily tidal inundated by the San Francisco Bay. The project has been designed to address inundation from tides, sea level rise, and flooding due to large rain events. None of the project elements will introduce pollutants to the area that could be mobilized during operation as a result of inundation due to a tsunami. Potential impacts due to tsunami would be less than significant.

Mitigation: None required.

Impact 3.9-4: The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Water Quality Control Plan

The San Francisco Bay Plan lists multiple beneficial uses for Corte Madera Creek, the Ross Valley Groundwater Basin, and the Central San Francisco Bay (Table 3.9-4). As described above, the project would not significantly affect groundwater and would therefore not affect the groundwater basin's beneficial uses. The removal of the concrete flood control channel and creation of a channel with natural substrate and riparian vegetation in Frederick Allen Park, removal of the Denil fish ladder, construction of larger fish resting pools, and creation of

saltwater marsh in Unit 2 would have a beneficial effect for uses relating to noncontact recreation, fish migration and habitat, and preservation of rare and endangered species. The project would not significantly affect uses related to water contact recreation, navigation, industrial service or process supply, or shellfish harvesting as compared to existing conditions. Table 3.9-6 below, contains additional detail on project impacts on beneficial uses. The impact would be less than significant.

Sustainable Groundwater Management Plan

The SGMA Basin Prioritization process designated the Ross Valley Groundwater Basin as a very low priority, therefore the project is not in an area subject to a sustainable groundwater management plan (DWR, 2019). The project would have no impact on implementation of a sustainable groundwater management plan.

Mitigation: None required.

Table 3.9-6 Project Impacts on Beneficial Uses

Beneficial Use	Waterbody	Project Impacts
Agricultural Supply	Ross Valley Groundwater Basin	**No impact.**
Municipal and Domestic Supply	Ross Valley Groundwater Basin	**No impact.**
Industrial Service Supply	SF Bay – Central, Ross Valley Groundwater Basin (Potential)	**No impact.**
Industrial Process Supply	SF Bay – Central, Ross Valley Groundwater Basin (Potential)	**No impact.**
Commercial and Sport Fishing	Corte Madera Creek, SF Bay – Central	**Beneficial.** The project improves instream migration and habitat for steelhead.
Shellfish Harvesting	SF Bay – Central	**No impact.**
Cold Freshwater Habitat	Corte Madera Creek	**Beneficial.** The project improves upstream and downstream migration and creates new rearing habitat suitable for salmonids.
Estuarine Habitat	SF Bay – Central	**Beneficial.** The Project creates 0.6 acre of new salt marsh habitat.
Fish Migration	Corte Madera Creek, SF Bay – Central	**Beneficial.** Removing the defunct fish ladder, reducing the channel slope, adding and enhancing fish pools, and removing the concrete in portions of Unit 2 and 3 improve upstream and downstream migration and rearing habitat for salmonids.
Preservation of Rare and Endangered Species	Corte Madera Creek, SF Bay – Central	**Beneficial.** The project improves instream habitat and migration for listed salmonids. Creation of salt marsh habitat in Unit 2 increases suitable habitat for California Ridgway's rail and salt marsh harvest mouse.

Beneficial Use	Waterbody	Project Impacts
Fish Spawning	Corte Madera Creek, SF Bay – Central	**No impact.** The project area lacks spawning habitat.
Warm Freshwater Habitat	Corte Madera Creek	**Beneficial.** The project improves bank stability and decreases erosion potential in Unit 4 and creates higher value riparian habitat within Frederick Allen Park.
Wildlife Habitat	Corte Madera Creek, SF Bay – Central	**Beneficial.** The project creates 0.6 acre of new tidal and wetland habitats and 0.8 acre of new riparian and upland transitional habitats in Unit 2 and creates higher value riparian habitat within Frederick Allen Park.
Water Contact Recreation	Corte Madera Creek, SF Bay – Central	**No impact.**
Noncontact Water Recreation	Corte Madera Creek, SF Bay – Central	**Beneficial.** Noncontact forms of water recreation (walking, sightseeing, wildlife watching and aesthetic enjoyment) are improved by replacing concrete portions of the channel and increasing riparian and wetland habitats within Fredrick Allen Park and in portions of Unit 2.
Navigation	Corte Madera Creek, SF Bay – Central	**No impact.**

Sources: (SFBRWQCB, 2017)

Impact 3.9-5: The project would not expose people or property to flooding hazards	**Significance Determination**
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

In-channel construction would occur during the dry season when anticipated creek flows would be lowest. In addition, a diversion and dewatering system would be implemented to facilitate construction within the channel. Therefore, construction of the project would not result in the exposure of people or property to water related hazards. The impact would be less than significant.

Operation and Maintenance

Overview

The project will reduce flooding within the Town of Ross and in unincorporated Kentfield. The effectiveness of the project in reducing flood hazards was evaluated through hydraulic modeling under the 10-year (10 percent probability in any given year), 25-year (4 percent probability in any given year), and 100-year (1 percent probability in any given year) flood recurrence intervals. The existing floodway and 100-year flood zone are shown in Figure 3.9-3.

The project impacts are shown graphically as the change in WSE or flood depth that would result from the project during the 10-, 25-, and 100-year flood events. The project impacts on

existing flood conditions are presented in Appendix E. The project impacts on future conditions are presented in Figure 3.9-7 through Figure 3.9-9. The model-predicted flood inundation depths are shown for the 10-year, 25-year, and 100-year events for the existing condition without project, existing condition with project, future condition without project, and future condition with project scenarios in Appendix E. Areas shown in the figures as "Flows Confined to Channel" are areas that are predicted to no longer have flood inundation from creek overtopping after the project is completed. Areas shown in the figures with "Flooding Reduced" are areas with significantly reduced flood inundation (greater than 0.2 foot) from creek overtopping after the project is completed. The impacts are described below by condition and area.

Project Impact on Existing Condition and Future Condition

Town of Ross (Unit 4 and Frederick Allen Park)

In Ross, flooding due to creek overtopping would be reduced throughout most of the existing flood inundation areas under the 10--year, 25-year, and 100-year flood scenarios for both existing and future conditions. Substantial reduction in flood elevation would occur along portions of Sylvan Lane, Lagunitas Road, Allen Avenue, Ross Common, Poplar Avenue, and Redwood Drive. The greatest improvements in flooding would be seen under the 10-year and 25-year flood scenarios under both existing and future conditions. In Frederick Allen Park, the graded/lowered areas would see increased flood inundation as those areas would be a part of the widened natural creek corridor for flow conveyance. Section 3.8 Hazards addresses the potential flood hazard within Frederick Allen Park.

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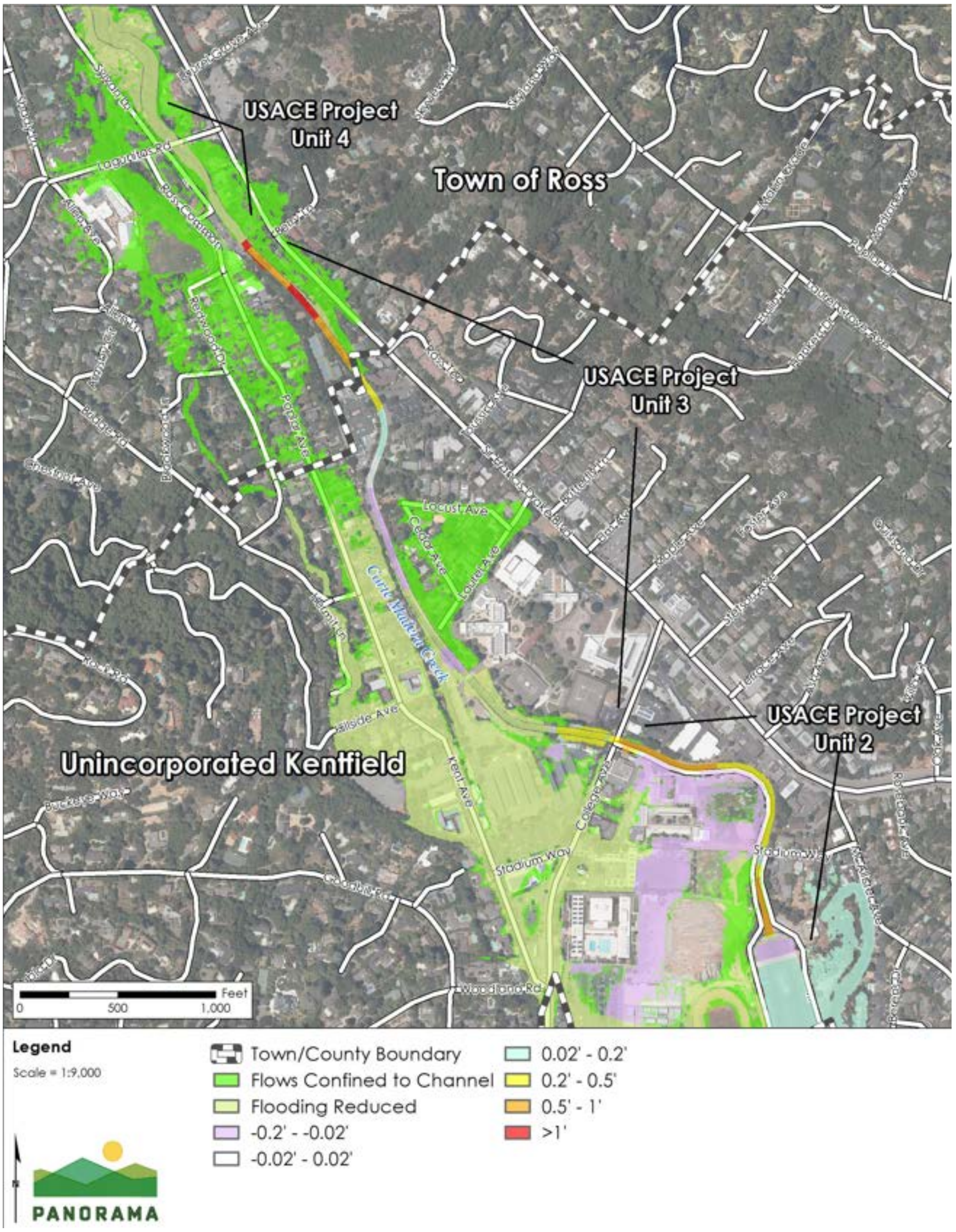
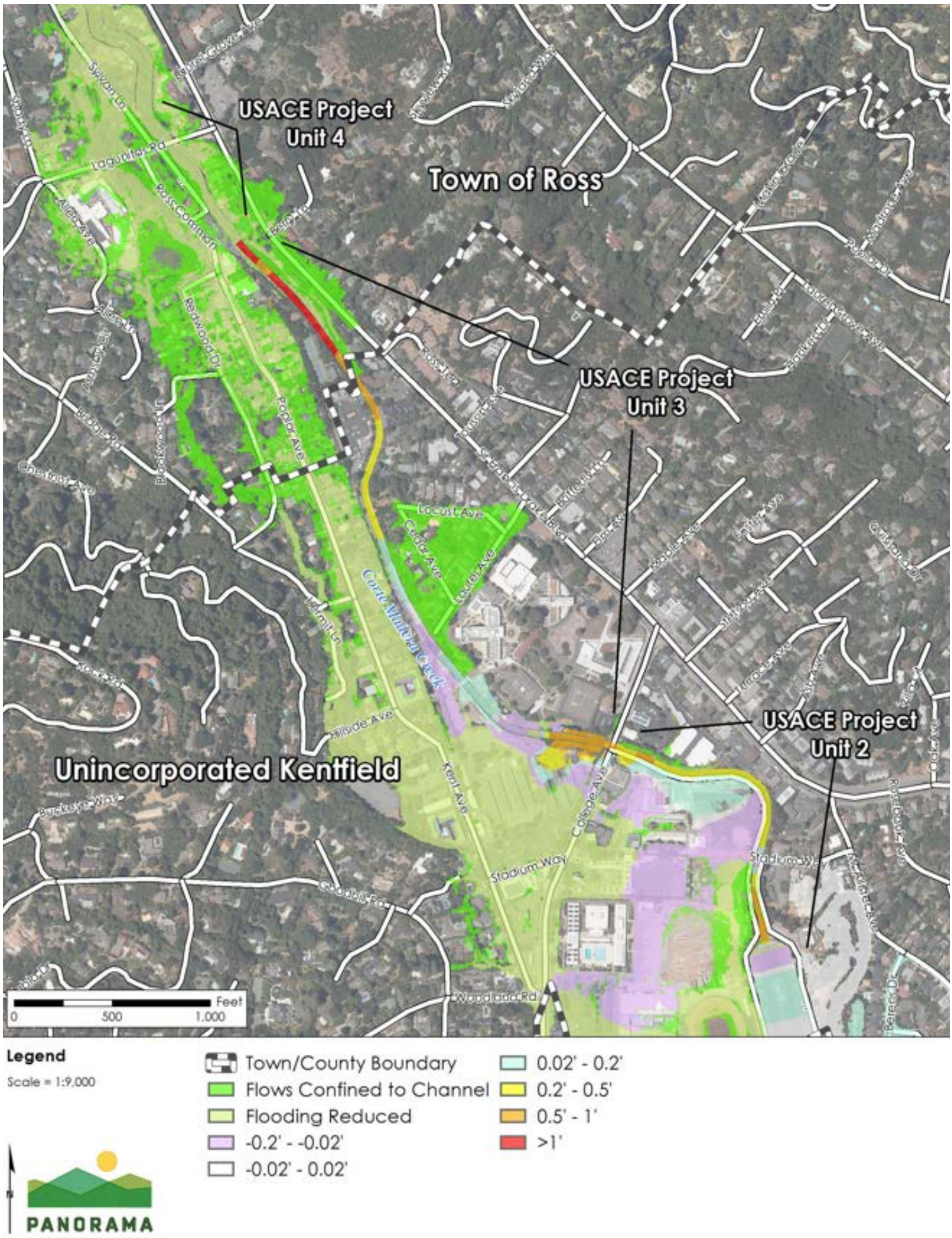
Figure 3.9-7 Project Changes in Water Surface Elevation from Future Conditions, 10-Year Flood Event



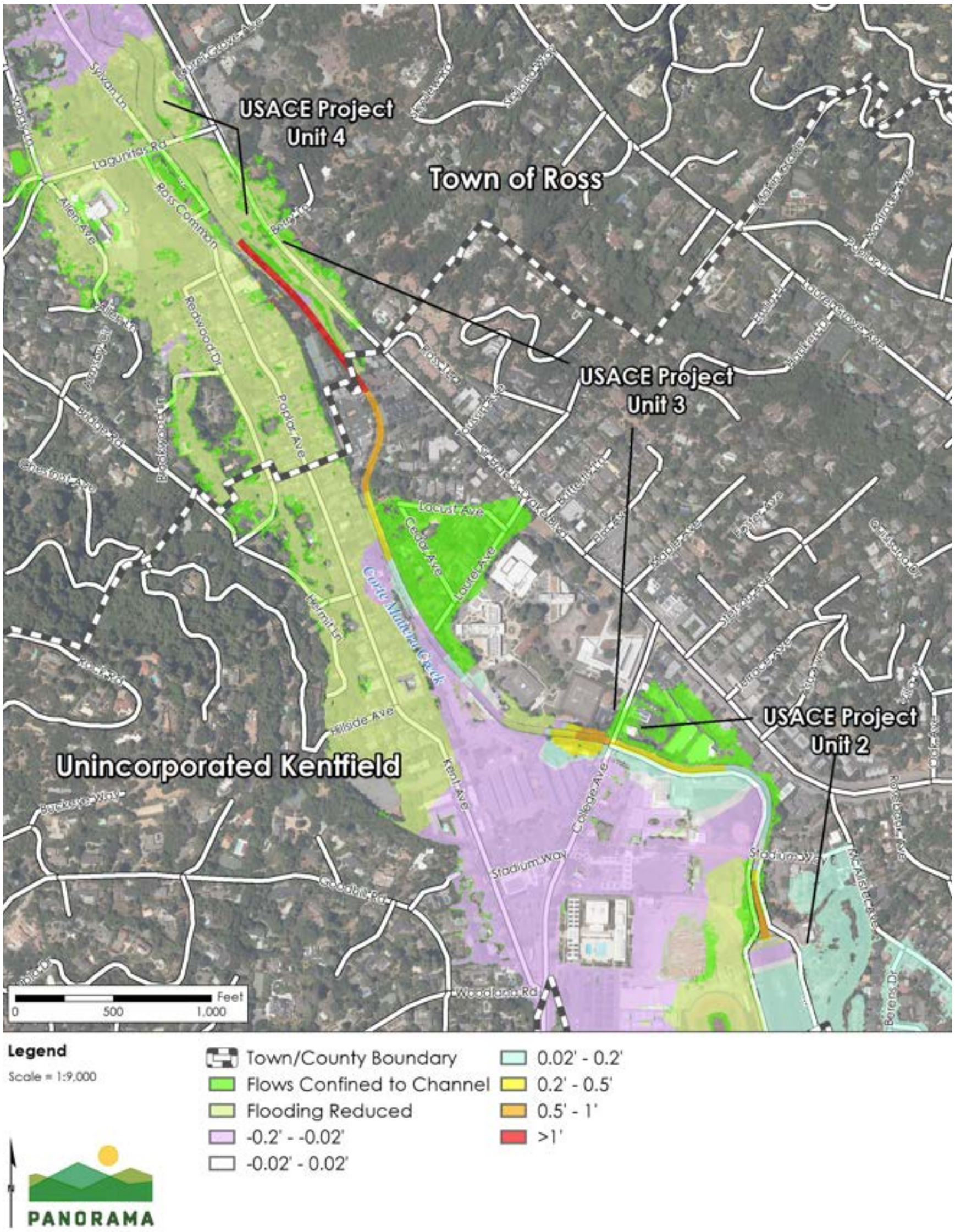
Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure 3.9-8 Project Changes in Water Surface Elevation from Future Conditions, 25-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure 3.9-9 Project Changes in Water Surface Elevation from Future Conditions, 100-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

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Increased flood inundation due to creek overtopping would not occur in the vicinity of Unit 4 in any commercial or residential areas. Operation and maintenance of the project would result in a net reduction of flooded residential and commercial areas and reduced water depth during flooding, thereby reducing the exposure of people and property to water-related hazards. The impact would be beneficial and less than significant.

Unit 3 (Unincorporated Kentfield)

In unincorporated Kentfield, flooding due to creek overtopping would be reduced throughout much of the existing flood inundation areas under the 10-year, 25-year, and 100-year flood scenarios for both existing and future conditions. Substantial reductions in flooding would occur in the Granton Park neighborhood along Cedar Avenue, Locust Avenue, and Laurel Avenue. The new pump station and floodwall will address the creek overtopping issue, and the creek backwater issue to the area's storm drain collection system. Note that localized overland flow may still occur when stormwater runoff in the area exceeds the storm drain pipeline capacity at Cedar Avenue and Laurel Avenue. Reduced flooding would also occur in residential and commercial areas west of Corte Madera Creek. Under the 25-year and 100-year flood scenarios for both existing and future conditions there would be WSE increases of 2 to 6 inches in small areas adjacent to the channel around the College of Marin, the Union Bank parking lot, and A.E. Kent Middle School. These impacts would be limited to parking lots, playgrounds, and elevated trailers. Localized flooding in these areas appears correlated to existing channel structures and existing hydraulic constraints at the College Avenue bridge crossing, and improved flow conveyance in Unit 4 as a result of the Denil fish ladder removal. Additional inundation due to creek overtopping would not occur in any new areas that are not already inundated during the 100-year event. Therefore, operation and maintenance of the project would result in a net reduction of flood areas thereby reducing the exposure of people and property to water related hazards. The impact would be beneficial and less than significant.

Unit 2 and Lower Corte Madera Creek

In Unit 2 and Lower Corte Madera Creek, flooding would be reduced throughout much of the existing flood inundation areas under the 10-year, 25-year, and 100-year flood scenarios for both existing and future conditions. The floodwall is proposed mainly to address potential additional creek overtopping as a result of the project, and its potential flood inundation impacts to the commercial area bounded by College Avenue, Sir Francis Drake Boulevard, and the creek. Additional inundation would not occur in any new areas that are not already inundated during the 100-year event. Increases in WSE of approximately 1 inch and less than 0.2 foot (2.4 inches) are predicted in areas downstream of College Avenue. Change in WSE less than 0.2 foot is less than the model precision and is within the range of model uncertainty as discussed in Section 3.9.5. Because the change in WSE is less than the precision of the current model, the impact is less than significant.

With the proposed project elements, including the floodwall to address potential creek overtopping to the left bank at the downstream of College Avenue, operation and maintenance of the project would result in a net reduction in flooding in the vicinity of Unit 2 and any projected increase in flooding is within the model uncertainty and less than significant. The

project would therefore reduce the exposure of people and property to water-related hazards and would not significantly increase flooding hazards. The impact would be beneficial and less than significant.

Summary of Project Benefits

The hydraulic modeling for both existing and future condition with project scenarios show either a reduction of flooding or no significant increase in flooding in areas adjacent to Corte Madera Creek in the Town of Ross or Kentfield, except in isolated, non-sensitive use areas (i.e., parking lots near College Avenue). The number of parcels ~~by area~~ in Ross Valley that would benefit from decreased flooding during a 25-year flood event under existing conditions are summarized in Table 3.9-7 below. The parcels that would benefit from reduced flooding during the 25-year flood event are shown in Figure 3.9-10.

Table 3.9-7 Summary of Project Flood Reduction Benefits, Existing Condition Scenario, 25-Year Event

Jurisdiction/Land Use	Number of ~~Structures~~ Parcels with Reduced Flooding				
	Area No Longer Inundated After Project	1 to 4.5 feet reduction in water surface	0.5 to 1 foot reduction in water surface	0.2 to 0.5 foot reduction in water surface	Total
Kentfield					
Commercial	4			5	9
Institutional	18		3	11	32
Residential	37	19	47	33	136
Kentfield Total	*59*	*19*	*50*	*49*	*177*
Larkspur					
Commercial				1	1
Institutional			2	3	5
Residential				11	11
Larkspur Total			*2*	*15*	*17*
Town of Ross					
Commercial	1	2	8		11
Institutional	3	17	3		23
Residential	2	48	35	14	99
Ross Subtotal	*6*	*67*	*46*	*14*	*133*
Total All Areas	**65**	**86**	**98**	**78**	**327**

[e] The reduction in flooding reflects changes in WSE based on model predictions for the existing hydrologic conditions. Reduction in flooding of less than 0.2 foot is below the model precision and is interpreted as no change in flood elevation.

Sea Level Rise Impacts

As discussed in Section 3.9.5, the future condition without project and future condition with project modeling includes an intermediate level of sea level rise of 1.0 foot. With an intermediate level of sea level rise, the project has broad benefits from reduced flooding in the Town of Ross and Kentfield areas. As presented in Table 3.9-3, there are multiple models of sea level rise and the high estimate of sea level rise exceeds the intermediate sea level rise estimate incorporated in the hydraulic modeling. Additional modeling was conducted to evaluate project impacts with current projections for sea level rise in year 2100 (CNRA 2018). The Year 2100 future condition model which includes a greater level of sea level rise shows that the project would still provide benefits by reducing flood inundation in areas within Ross Valley; however, additional areas would be subject to tidal inundation and the benefits would be less in areas that are subject to tidal inundation/flooding.

The purpose of the project is to reduce flooding on Corte Madera Creek and the project is not intended to address flooding from sea level rise. While the project does not address sea level rise impacts, the project will not exacerbate flooding impacts when sea level rise is considered and would have flood reduction benefits in areas not subject to tidal flooding, including the Town of Ross, as demonstrated by the future condition with project and Year 2100 future condition with project modeling. Separate from this project, the County has conducted a vulnerability assessment for sea level rise (Marin County Department of Public Works, 2017). Since completing the vulnerability assessment, BayWAVE has led efforts to develop a countywide collaboration for adaption, the County has evaluated a nature-based adaptation framework, and developed adaptation land use planning guidance. The County also participates in several regional efforts to plan for climate change resilience and adaptation. The Town of Corte Madera recently developed a Climate Action Plan that addresses sea level rise along the waterfront including wetlands south of Corte Madera Creek. The project supplements and will not conflict with or impact on-going planning efforts to address sea level rise effects.

Mitigation: None required.

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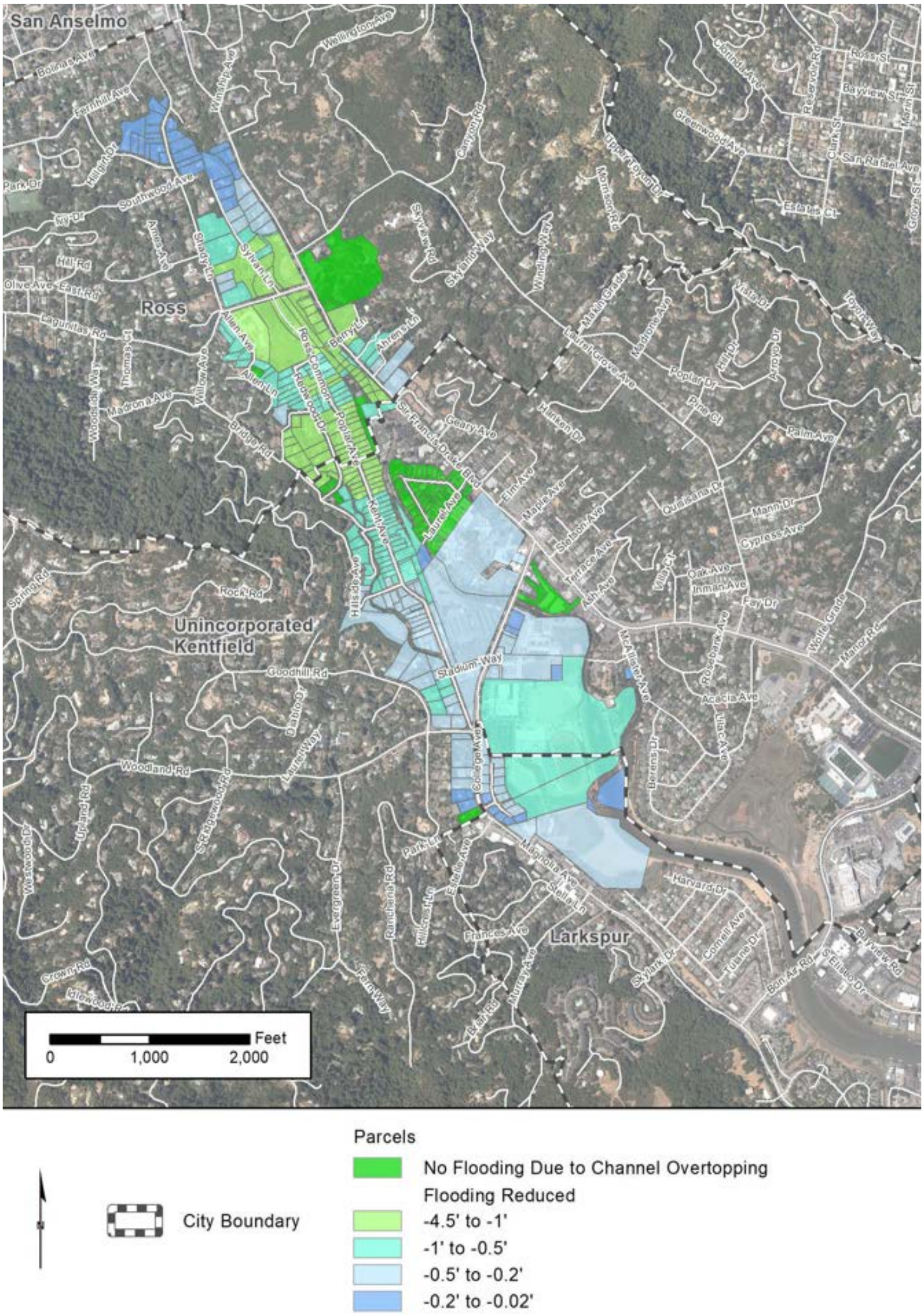
Figure 3.9-10 Reduction in Water Surface Elevation by Parcel, Existing Condition 25-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

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3.9.7 References

A. A. Rich and Associates (Rich). (2000, November). *Fishery Resources Conditions of the Corte Madera Creek Watershed.* Prepared for Friends of Corte Madera Creek Watershed, San Anselmo.

Bay Area Open Space Council. (2011, May). Bay Area Cities GIS dataset. *San Francisco Bay Area Upland Habitat Goals Project*. GreenInfo Network.

California Department of Water Resources (DWR). (2019). *Sustainable Groundwater Management Act, 2019 Basin Prioritization.* Retrieved from https://gis.water.ca.gov/app/bbat/

California Emergency Management Agency. (2009, July 1). *Tsunami Inundation Map for Emergency Planning, San Rafael Quadrangle/San Quentin Quadrangle*. Retrieved November 10, 2020, from https://www.conservation.ca.gov/cgs/Documents/Publications/Tsunami-Maps/Tsunami_Inundation_SanRafaelSanQuentin_Quads_Marin.pdf

California Natural Resources Agency. (2018). *State of California Sea-Level Rise Guidance/2018 Update.*

California State Water Resources Control Board (SWRCB). (2018). *Final 2014/2016 California Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report).* Retrieved from https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml.

Copeland, R. R. (2000). *Corte Madera Creek, Marin County, California, Modified Unit 4 Sedimentation.* Prepared for U.S. Army Engineer District, San Francisco.

Copeland, R. R., & Thomas, W. A. (1986). *Corte Madera Creek sedimentation study. Numerical Model.* Prepared for U.S. Army Engineer District, Sacramento, California.

Council, N. R. (2012). *Sea-Level Rise for the Coasts of California, Oregon, and Washington, Past, Present, and Future*. Retrieved from https://www.nap.edu/catalog/13389/sea-level-rise-for-the-coasts-of-california-oregon-and-washington

Engineers, U. A. (2019). *Sea-Level Change Curve Calculator (Version 2019.21)*. Retrieved from http://corpsmapu.usace.army.mil/rccinfo/slc/slcc_calc.html

Environmental Resource Group, Inc. (2013). *Phase II Environmental Site Assessment and Low-Threat Closure Evaluation College of Marin Corporation Yard, Kentfield, California. Prepared for College of Marin.*

Federal Emergency Management Agency (FEMA). (2016). *Flood Insurance Study Volume 1 of 3 Marin County, California, and Incorporated Areas.* Flood Insurance Study Number 06041CV001C.

Federal Emergency Management Agency (FEMA). (2017). *Flood Insurance Study, Marin County California.* Revised August 15, 2017.

Federal Emergency Management Authority (FEMA). (2009b, November). Guidelines and Specifications for Flood Hazard Mapping Partners. Appendix C: Guidance for Riverine Flooding Analyses and Mapping.

Firth, W. (2010, June 30). Personal communication with USACE Hydraulic Engineer.

Fischer, D. T. (1996, November). Simulation of a Century of Runoff across the Tomales Watershed, Marin County, California. *Journal of Hydrology, Volume 186*, 253-273.

Friends of Corte Madera Creek Watershead (Friends). (2006). *E. coli and Enterococcus Testing, Corte Madera Creek Watershed 2003 to 2006.*

Friends of Corte Madera Creek Watershed (Friends). (2004). *History of Flood Management Efforts in the Corte Madera Creek Watershed 1960 to 2004.*

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County. (2005a). *Hydrology and Water Quality Technical Background Report, Marin Countywide.* Marin County. Retrieved Updated November 2005

Marin County. (2007). *Marin Countywide Plan Final Environmental Impact Report.* Prepared by Nichols Berman Environmental Planning. Retrieved October 13, 2020, from https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_eir/cwpupdatefeir1107.pdf

Marin County. (2013). *San Francisco Bay Area Integrated Regional Water Management Plan.* Marin County.

Marin County. (2017). *Marin Shoreline Sea Level Rise Vulnerability Assessment/Bay Waterfront Adaptation and Vulnerability Evlauation (BayWAVE).*

Marin County. (2020a). *Information for Municipal Staff Implementing Phase II Municipal (MS4) Stormwater Permit requirements.* Department of Public Works. Retrieved October 13, 2020, from https://www.marincounty.org/depts/pw/divisions/creeks-bay-and-flood/mcstoppp/municipalities-only

~~Marin County. (2020b). *Marin County Flood Control and Water Conservation District, Real-Time Rainfall, Creek Stage, and Weather Data.* Retrieved from County of Marin: https://marin.onerain.com/site/?site_id=1555&site=0fc267e5-331e-48fc-8a35-8512b95e4737~~

Marin County. (2020c). *Sea Level Rise Scenarios*. Retrieved from County of Marin: https://www.marincounty.org/main/marin-sea-level-rise/baywave/sea-level-rise-scenarios

Marin County Flood Control & Water Conservation District. (2020). *Ross Valley Flood Protection & Watershed Program, Zone 9 Program History*. Retrieved from https://www.marinwatersheds.org/creeks-watersheds/ross-valley-flood-protection-watershed-program/zone-9-program-history

Marin County Flood Control and Water Conservation District (District). (2000). *Flood Control Zone Nine,.* Prepared by the Marin County Water Conservation and Flood Control District.

Marin County Stormwater Pollution Prevention Program (MCSTOPPP). (2013, October). 2012-2013 Annual Report.

Marin County Stormwater Pollution Prevention Program (MCSTOPPP) and City of Petaluma. (2016). *Year 1 Monitoring Report Diazinon and Pesticide-Related Toxicity TMDL Monitoring Program in Urban Creeks.* Prepared by Larry Walker Associates. Retrieved October 13, 2020, from https://www.marincounty.org/~/media/files/departments/pw/mcstoppp/municipalities_only/e13_pesticides_tmdl_monitoring_report-1516.pdf?la=en

Marine County. (1994, May 17). *Environmental Impact Review Guidlines*. Retrieved November 5, 2020, from https://www.marincounty.org/-/media/files/departments/cd/planning/environmental-impact/erguide1994.pdf

Philip Williams & Associates, Ltd (PWA). (2009a, April). *Hydrologic Analysis for Marin County, CA, Task Order No. 5.* Prepared by Philip Williams. Prepared for FEMA. PWA Ref #1914.02.

Philip Williams & Associates, Ltd (PWA). (2009b, September). *Draft Hydraulic Analysis for Marin County, CA, Task Order No. 5.* Prepared by Philip Williams & Associates, Ltd. Prepared for FEMA. .

PWA. (2009b). *Draft Hydraulic Analysis for Marin County, CA, Task Order No. 5. Prepared by Philip Williams & Associates, Ltd. Prepared for FEMA. PWA Ref #1914.02.*

San Francisco Regional Water Quality Control Board (SFBRWQCB). (2017). *Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin.* Retrieved October 13, 2020, from https://www.waterboards.ca.gov/sanfranciscobay/basin_planning.html

State Water Resources Control Board (SWRCB). (2013, February 5). Water Quality Order No. 2013-0001-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No CAS000004, Waste Discharge Requirements (WDRs) for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s).

Stetson Engineering, Inc (Stetson). (2017). *Report on Hydraulic Modeling of Corte Madera Creek Option C for the Phoenix Lake.*

Stetson Engineers Inc. (Stetson). (2000). *Geomorphic Assessment of the Corte Madera Creek Watershed, Marin County, California.* Prepared for the Marin County Flood Control District and Friends of Corte Madera Creek by Stetson Engineers (Matt Smeltzer and James Reilly) with David Dawdy, San Rafael, CA.

Stetson Engineers, Inc. (Stetson). (2006, April). *A Framework for Developing Effective Management Solutions to Flooding in the Ross.* by Stetson Engineers, Inc.

Stetson Engineers, Inc. (Stetson). (2007, December). *Appraisal-Level Hydraulic Engineering Study of Corte Madera Creek, San Anselmo to Larkspur, CA.* by Stetson Engineers, Inc.

Stetson Engineers, Inc. (Stetson). (2011). *Ross Valley Flood Protection and Watershed Program/ Capital Improvement Plan Study for Flood Reduction and Creek Management.*

Stetson Engineers, Inc. (Stetson). (2015). Preparation of Data, Hydraulic Modeling and Floodplain Mapping of the "Future Without Project" Condition for the Army Corps Unit 4 Project.

Stillwater Sciences. (2020). *Preliminary Wetland Delineation for the Corte Madera Creek Flood Risk Management Project, Marin County, California.*

Tele Atlas North America, Inc. (2020). U.S. and Canada Detailed Streets GIS dataset. *ESRI® Data & Maps: StreetMap™*. ESRI.

Town of Ross. (1970). *Municipal Code.*

Town of Ross. (1991). *Municipal Code.*

Town of Ross. (1994). *Municipal Code.*

Town of Ross. (2007, June). *Town of Ross General Plan.*

Town of Ross. (2020). *Municipal Code*. Retrieved July 29, 2020, from https://www.townofross.org/administration/page/municipal-code

Town of Ross. (n.d.). *Municipal Code.*

U.S. Army Corps of Engineers (USACE). (1966). *Design Memorandum No. 1, Corte Madera Creek Flood Control Project.* Marin County, California: U.S. Army Corps of Engineers, San Francisco District.

U.S. Army Corps of Engineers (USACE). (1974a). *U.S. Army Corps of Engineers General Design Memorandum.*

U.S. Army Corps of Engineers (USACE). (1974b). *Final Environmental Impact Statement, Corte Madera Creek Flood Control Project.* Marin County, CA: U.S. Army Corps of Engineers, Sacramento District.

U.S. Army Corps of Engineers (USACE). (1987a). *Design Memorandum No. 2, Corte Madera Creek Flood Control Project.* Marin County, CA: Unit 4, U.S. Army Corps of Engineers, Sacramento District.

U.S. Army Corps of Engineers (USACE). (1987b). *Final Supplemental Environmental Impact Statement, Corte Madera Creek Flood Control.* Marin County, CA: Unit 4, U.S. Army Corps of Engineers, Sacramento District.

U.S. Army Corps of Engineers (USACE). (1988, July). *Supplement Information Paper, Corte Madera Creek Flood Control Project.* U.S. Army Corps of Engineers, Sacramento District, Marin County, CA.

U.S. Army Corps of Engineers (USACE). (2000a). *Corte Madera Creek General Re-Evaluation Report, Hydrology and Hydraulics Appendix.*

U.S. Army Corps of Engineers (USACE). (2000b, January). *Corte Madera Flood Control Project. Alternative Screening Conference Document,.* Prepared by U.S. Army Corps of Engineers, San Francisco District.

U.S. Army Corps of Engineers (USACE). (2008).

~~U.S. Army Corps of Engineers (USACE). (2009b).~~

U.S. Army Corps of Engineers (USACE). (2010, December). *Corte Madera Creek Flood Control Study Baseline Report.* San Francisco, CA: U.S. Army Corps of Engineers, San Francisco District.

U.S. Army Corps of Engineers (USACE). (2013).

U.S. Army Corps of Engineers. (2018). *Corte Madera Creek Flood Risk Management Project Environmental Impact Statement/Environmental Impact Report.* Marin County, CA: U.S. Army Corps of Engineers San Francisco District.

U.S. Geological Survey. (2016). National Hydrography Dataset Waterbodies GIS dataset.

US Geological Survey. (2013). USGS NED 1/3 Arc Second DEM Raster dataset.

Western Regional Climate Center (WRCC). (2020). *Kentfield, California*. Retrieved from Western Regional Climate Center: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4500

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3.10 Noise

3.10.1 Introduction

This section includes an evaluation of the potential for the project to result in adverse impacts related to noise. This section describes the existing noise environment and identifies nearby sensitive receptors, presents relevant local noise ordinances and standards, and discusses potential project impacts and appropriate mitigation measures, as necessary.

3.10.2 Scoping Comments

Comments related to noise impacts were received during the public scoping process. These comments and the location where they are addressed in the noise analysis are provided in Table 3.10-1.

Table 3.10-1 Noise Scoping Comments

Agency/Entity	Comment	Location in Noise Section that Comment is Addressed
Edi Alvarez and Neil Dukas	What noise, if any, may be associated with the ongoing operation of a pump station located at the foot of Laurel Avenue and adjacent to the creek?	Section 3.10.6, Impact 3.10-1
Garril Page	No one in Ross welcomes the noise of Sir Francis Drake Blvd. The FAP Riparian Corridor results in permanent, increased noise intrusion from SFD throughout a large portion of Ross. The longer construction period of FAP Riparian Corridor means extended, expanded exposure to all aspects of construction noise.	Section 3.10.6, Impact 3.10-1

3.10.3 Fundamentals of Noise

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as unwanted sound (i.e., loud, unexpected, or annoying sound). Acoustics is defined as the physics of sound. In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determine the sound level and characteristics of the noise perceived by the receiver. Acoustics addresses primarily the propagation and control of sound.

Frequency

The number of sound pressure peaks travelling past a given point in a single second is referred to as the frequency, expressed in cycles per second or Hertz (Hz). A given sound may consist of energy at a single frequency (pure tone) or in many frequencies over a broad frequency range

(or band). Human hearing is generally affected by sound frequencies between 20 Hz and 20,000 Hz.

Amplitude

The amplitude of pressure waves generated by a sound source determines the perceived loudness of that source. Sound pressure amplitude is measured in micro-Pascals (μPa). One μPa is approximately one-hundred billionths of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 μPa to 100,000,000 μPa. Because of this huge range of values, sound is rarely expressed in terms of pressure. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of human hearing (near total silence) is approximately 0 dB, which corresponds to 20 μPa.

Addition of Decibels

Because dBs are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic means. Under the dB scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two sources are each producing sound of the same magnitude, the resulting sound level at a given distance would be approximately 3 dB higher than one of the sources under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB – rather they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level of approximately 5 dB louder than one source, and ten sources of equal loudness together produce a sound level of approximately 10 dB louder than the single source.

A-Weighted Decibels

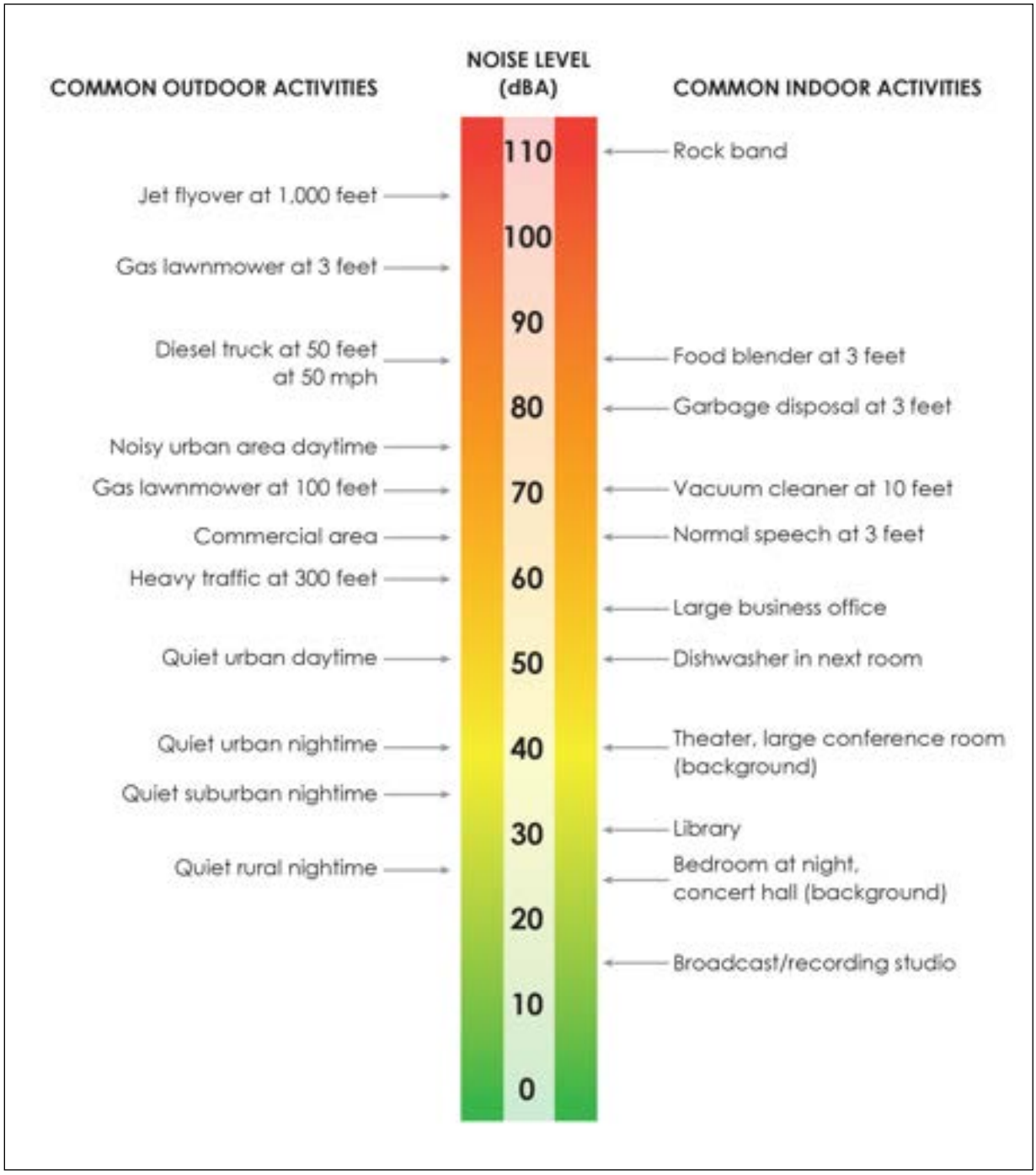
Figure 3.10-1 illustrates sound levels associated with common sound sources. The perceived loudness of sound is dependent on many factors, including magnitude and frequency. However, within the usual range of environmental sound levels, perception of loudness is relatively predictable and can be approximated by frequency filtering using the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the dBA sound level has become the standard descriptor for environmental noise assessment. All noise levels reported in this section are expressed as A-weighted levels.

Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, for a given sound-level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different from what is measured.

Under controlled conditions in a laboratory setting, the trained, healthy human ear is able to discern 1-dBA changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency range (1,000 Hz to 8,000 Hz). In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments.

Figure 3.10-1 Typical Noise Levels



Source: (Caltrans, 2013a)

Further, a 6-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy that would result in a 3-dB increase in SPL would generally be perceived as barely detectable. Refer to Table 3.10-2 for the approximate relationship between increases in environmental noise level and human perception.

Table 3.10-2 Approximate Relationship Between Increases in Environmental Noise Level and Human Perception

Noise Level Increase, dBA	Human Perception (Typical)
Up to about 3	Generally not perceptible
About 3	Barely perceptible
About 6	Distinctly noticeable
About 10	Twice as loud
About 20	Four times as loud

Source: (Cavanaugh, Tocci, & Wilkes, 2009)

Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in environmental noise analysis and are applicable to this study:

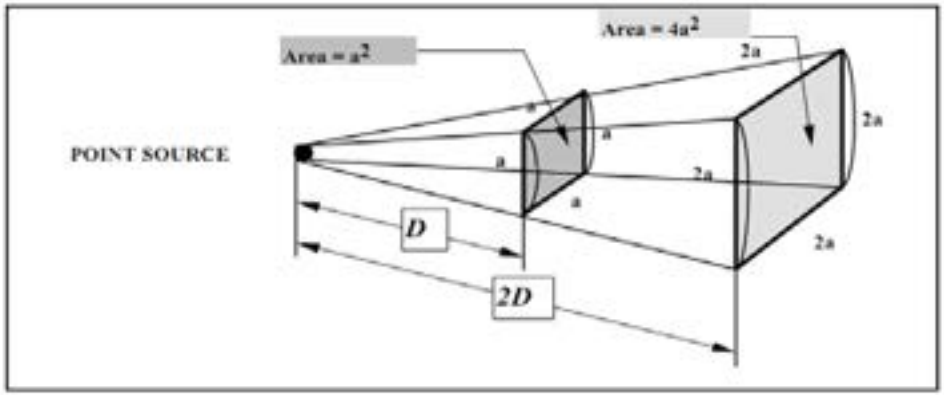
1. **Equivalent Sound Level (L_{eq}):** The L_{eq} represents an average of the sound energy occurring over a specified time period. In effect, the L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The one-hour A-weighted L_{eq} level is the energy average of dBAs occurring during a one-hour period.
2. **Maximum Sound Level (L_{max}):** The L_{max} is the highest instantaneous sound level measured during a specified period.
3. **Minimum Sound Level (L_{min}):** The L_{min} is the lowest instantaneous sound level measured during a specified period.
4. **Day–Night Average Level (L_{dn}):** The L_{dn} is the energy average of dBAs occurring over a 24-hour period, with a 10-dB "penalty" applied to dBAs occurring during nighttime hours (10:00 p.m. to 7:00 a.m.).
5. **Community Noise Equivalent Level (CNEL)**: Similar to the Ldn, the CNEL is the energy average of A-weighted sound levels over a 24-hour period, with a 5-dB penalty added for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dB penalty between the hours of 10:00 p.m. and 7:00 a.m.

Sound Propagation

Sound from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern; therefore, this type of propagation is called spherical spreading. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source as its energy is continuously spread out over a spherical surface (see Figure 3.10-2 for an illustration of spherical spreading of noise from a point source). Point sources of noise, such as stationary equipment or on-site construction equipment, attenuate (lessen) at a rate of 6.0 dB per doubling

of distance from the source. Noise attenuation from a point source increases by 1.5 dB from 6 dB to 7.5 dB for each doubling of distance due to ground absorption and reflective wave canceling. These factors are collectively referred to as *excess ground attenuation*. The basic geometric-spreading loss rate is used where the ground surface between a noise source and a receiver is reflective, such as parking lots or a smooth body of water. The excess ground attenuation rate (7.5 dB per doubling of distance) is used where the ground surface is absorptive, such as soft dirt, grass, or scattered bushes and trees.

Figure 3.10-2 Point Source Spreading with Distance



Source: (Caltrans, 2013a)

Widely distributed noises, such as a street with moving vehicles (a "line" source), would typically attenuate at a lower rate of approximately 3 dB for each doubling of distance between the source and the receiver. If the ground surface between source and receiver is absorptive rather than reflective, the nominal rate increases to 4.5 dB for each doubling of distance. Atmospheric effects, such as wind and temperature gradients, can also influence noise -attenuation rates from both line and point sources of noise. However, unlike ground attenuation, atmospheric effects are constantly changing and difficult to predict.

Trees and vegetation, buildings, and/or barriers between a source and receiver reduce the noise level that would otherwise occur at a given receptor. However, for a vegetative strip to have a noticeable effect on noise levels, it must be dense and wide. For example, a stand of trees must be at least 100 feet wide and dense enough to completely obstruct a visual path to the roadway to attenuate traffic noise by 5 dB (Caltrans, 2013a). A row of structures can shield more distant receivers depending upon the size and spacing of the intervening structures and site geometry. Similar to vegetative strips discussed above, noise barriers, which include natural topography and soundwalls, reduce noise by blocking the line of sight between the source and receiver. Generally, a noise barrier that breaks the line of sight between source and receiver will provide at least a 5-dB reduction in noise.

Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several descriptors are typically used to quantify the amplitude of vibration including peak particle velocity (PPV) and root

mean square velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave and is typically expressed in units of inches per second (in/sec). The PPV is most frequently used to describe vibration impacts on buildings. Root mean square velocity is defined as the average of the squared amplitude of the signal, usually measured in decibels referenced to one microinch per second, and is reported as vibration decibels (VdB). The decibel notation acts to compress the range of numbers required to describe vibration (FTA, 2006). VdB vibration velocity amplitudes are used to evaluate human response to vibration. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints even though there is very little risk of actual structural damage. In high-noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows. In suburban environments, such as the project area, sources of groundborne vibration include construction activities and heavy trucks and buses. Typically, groundborne vibration generated by human-made activities attenuates rapidly with distance from the source of the vibration.

Groundborne vibration can be an annoyance. The primary effect of perceptible vibration is often a concern. However, secondary effects, such as the rattling of a china cabinet, can also occur even when vibration levels are well below perception. Any effect (primary perceptible vibration, secondary effects, or a combination of the two) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping or reading will be more sensitive than someone who is running on a treadmill. Reoccurring primary and secondary vibration effects often lead people to believe that the vibration is damaging their home although those vibration levels may be well below minimum thresholds for damage potential. Vibration generated by construction activity has the potential to damage structures. This damage could be structural damage, such as cracking of floor slabs, foundations, columns, beams, or wells or cosmetic architectural damage, such as cracked plaster, stucco, or tile.

Construction Vibration

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile-driving and vibratory compaction equipment typically generates the highest construction-related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans. The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels such as people in an urban environment may tolerate a higher vibration level. Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may

threaten the integrity of the building. Construction-induced vibration that can be detrimental to a building is very rare and has only been observed in instances where the structure is in a high state of disrepair and the construction activity (e.g., impact pile driving) occurs immediately adjacent to the structure.

Table 3.10-3 displays the human reactions and effects on buildings that can be caused by various continuous vibration levels. As discussed previously, annoyance is a subjective measure, and vibrations may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations at the threshold of perception can be annoying.

Table 3.10-3 Approximate Reaction of People and Damage to Buildings from Construction Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly to strongly perceptible	Recommended upper limit of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe – vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: (Caltrans, 2013a)

3.10.4 Environmental Setting

Existing Ambient Noise Environment

The project is located in a low density, suburban residential area with no close exposure to heavily traveled roadways except traffic along Sir Francis Drake Boulevard, which is readily noticeable along Corte Madera Creek. Noise sources in the project vicinity include vehicle traffic on Sir Francis Drake Boulevard and Lagunitas Road (approximately 120 feet east of upper Unit 3 and crossing Unit 4, respectively), traffic along adjacent roadways, and passing walkers, runners, and bicyclists along Bike Route 20. The majority of ambient noise in the project area is associated with transportation-related sources, especially in areas where the creek approaches or is crossed by roadways. There are no known sources of substantial permanent stationary source noise in the project area. Within the project area, the majority of perceivable groundborne vibration is associated with vehicular traffic and is limited to large, loaded vehicles such as haul trucks on local roadways.

Noise measurements were collected at three locations along Corte Madera Creek and in the vicinity of the creek to characterize existing daytime noise conditions caused by various noise sources. Ambient noise levels were monitored at general locations where noise levels are considered representative of typical uses in the area. The noise monitoring locations are shown in Figure 3.10-3.

Noise levels were monitored using an Extech SDL600, Type 2 meter, which meets the standards of the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. The average noise levels and sources of noise measured at each location are identified in Table 3.10-4. The recorded daytime noise levels are characteristic of a low -density, suburban residential area with no close exposure to heavily traveled roadways. Noise measurements were taken on Wednesday, September 16, 2020, at mid-day to sample average ambient noise levels likely to occur during construction of the project.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to noise levels than others due to the duration and nature of time people spend at these uses. In general, residences are considered most sensitive to noise as people spend extended periods of time in them including the nighttime hours. Therefore, noise impacts to rest and relaxation, sleep, and communication are highest at residential uses. Schools, hotels, hospitals, nursing homes, and recreational uses are also considered to be more sensitive to noise as activities at these land uses involve rest and recovery, relaxation, and concentration and increased noise levels tend to disrupt such activities. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate, are also sensitive to noise, but due to the limited time people spend at these uses, impacts are usually tolerable. Commercial and industrial uses are considered the least noise sensitive.

Sensitive land uses within 1,000 feet of the project area include single family residences along the left and right banks of Corte Madera Creek, Ross Common Park, Frederick Allen Park, Ross Elementary School, Kentfield Hospital, Adaline E. Kent Middle School, and the College of Marin. Residences are generally located within 50 feet of the channel in Units 4 and 3. Ross Elementary School and Adaline E. Kent Middle School are approximately 485 feet and 543 feet from the nearest project elements, respectively. College of Marin borders Corte Madera Creek, within 50 feet of the project area. Kentfield Hospital is located approximately 61 feet from the project area. The sensitive land uses and associated receptors within 1,000 feet of the project area are shown in Figure 3.10-3 and summarized in Table 3.10-5.

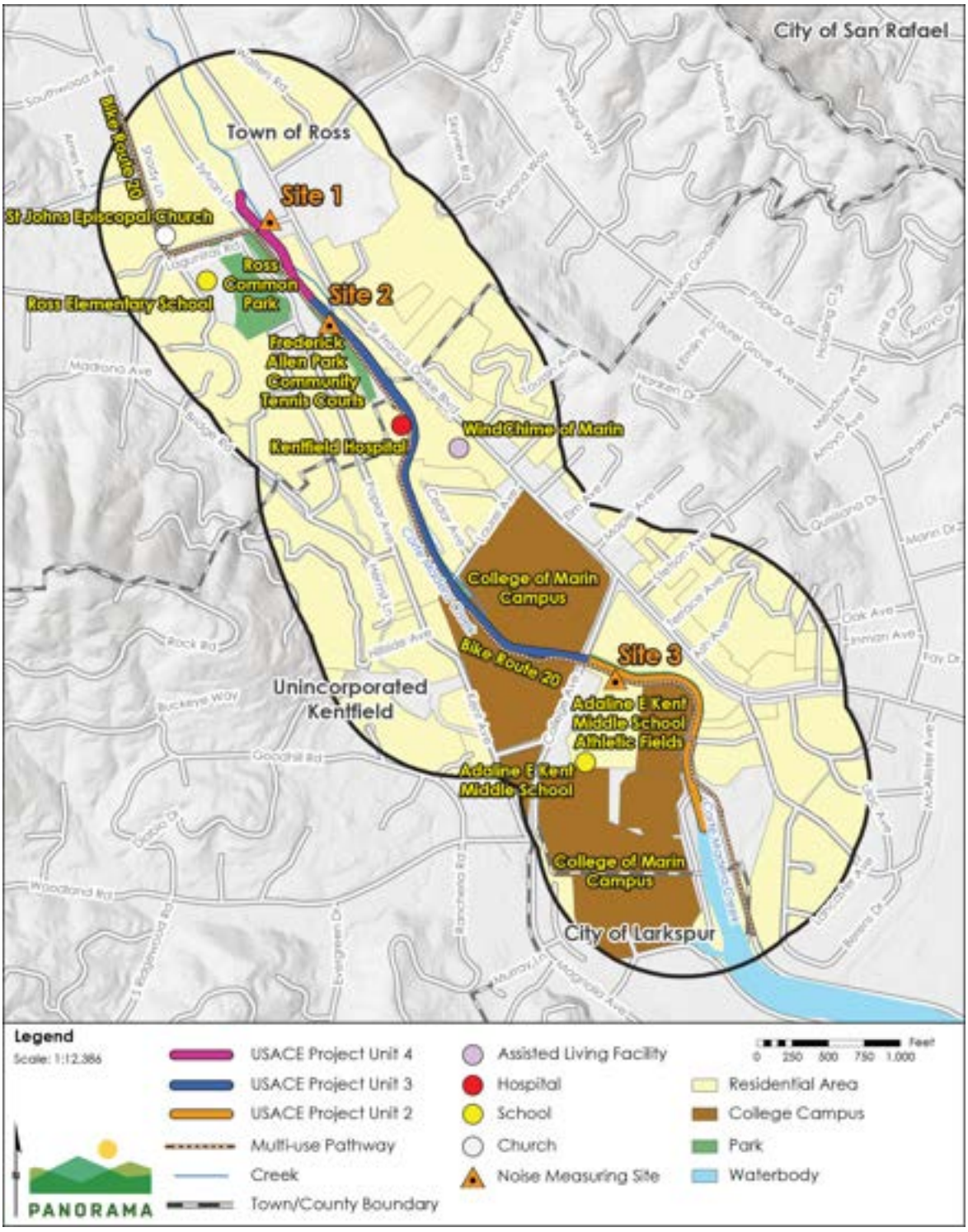
Table 3.10-4 Ambient Noise Levels at Noise Monitoring Locations

Measurement Location	L_{min}, dBA	L_{90}, dBA	L_{eq}, dBA	L_{10}, dBA	L_{max}, dBA	Noise Sources
Site 1: Near Ross Town Hall, adjacent to Lagunitas Road	45.9	53.5	62.9	66.7	76.6	Traffic passing on Lagunitas Road (adjacent to and south of the monitor), especially when queuing for left turn onto Sir Francis Drake Boulevard, is most influential; Sir Francis Drake traffic
Site 2: Frederick Allen Park; Creekside bicycle path	42.2	46.6	51.8	53.9	59.8	Traffic passing on Sir Francis Drake Boulevard (about 150 feet north) is most influential; passing walkers, runners, and bicyclists
Site 3: Creekside bicycle path, north of athletic fields at middle school	40.2	42.4	46.3	48.5	57.4	Distant traffic passing on Sir Francis Drake Boulevard (about 400 feet north) is most influential; passing walkers, runners, and bicyclists

Note:

[a] L_{eq} is a constant sound level that carries the same sound energy as the actual time-varying sound over the measurement period. L_{min}, L_{90}, L_{10}, and L_{max} are the minimum sound level, the sound level exceeded 90% of the time, the sound level exceeded 10% of the time, and the maximum sound level, respectively, all as recorded during measurement periods of 10-minute duration.

Figure 3.10-3 Noise Measuring Sites and Sensitive Receptors within 1,000 Feet of the Project Area



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, US Geological Survey 2013, Esri, United States Geological Survey, U.S. Geographic Names Information System 2020)

Table 3.10-5 Sensitive Receptors within 1,000 Feet of the Project Area

Project Unit	Sensitive Land Use	Nearest Sensitive Receptor Location
Unit 4	Church, school, residences	• Residential properties directly abut the construction area and are above the creek. • Ross Elementary School is approximately 485 feet west of the proposed Grading Transition Area in Unit 4. • St. John's Episcopal Church is approximately 560 feet west of the proposed Grading Transition Area in Unit 4. • Ross Common Park is approximately 80 feet west of the proposed Grading Transition Area in Unit 4.
Unit 3	Hospital, assisted living facility, school, college campus, residences	• Residences directly abut the proposed grading area and floodwall on the east side of Fredrick Allen Park. • Residential properties directly abut the proposed floodwalls in lower Unit 3 • There are residences located approximate 35 feet west of the channel where the new fish pools and floodwall will be located in Lower Unit 3. • Kentfield Hospital is approximately 61 feet west of the channel where the new fish pools and floodwall will be located in Unit 3. • College of Marin campus is adjacent to the proposed floodwall and stormwater pump station in Unit 3 from Laurel Avenue to College. • Wind Chime of Marin (assisted living facility) is approximately 306 feet east of the channel where the new fish pools and floodwall will be located in Unit 3.
Unit 2	School, college campus, residences	• There is a college campus building located approximately 46 feet northwest of the proposed Unit 2 floodwall. • The proposed Unit 2 floodwall abuts residential properties. • Adaline E. Kent Middle School is located approximately 543 feet west of the proposed Unit 2 floodwall.

3.10.5 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

Truck Operations

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters (approximately 50 feet) from the vehicle pathway centerline. These limits are implemented through regulatory controls on truck manufacturers.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration aims to ensure worker safety and health in the United States by working with employers and employees to create better working

environments. With regard to noise exposure and workers, Occupational Safety and Health Administration regulations set forth accepted criteria to protect the hearing of workers exposed to occupational noise. Noise exposure regulations are listed in 29 CFR Section 1910.95. Most applicable to the project, 1910.95(c)(1) states that an employer shall administer a hearing conservation program whenever noise exposure levels equal or exceed an eight-hour time-weighted average sound level of 85 dBA.

State Regulations

California Government Code Section 65302 encourages each local government entity to implement a noise element as part of its general plan. In addition, the California Governor's Office of Planning and Research has developed guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. According to the guidelines, exterior noise exposures generally fall into three categories: normally acceptable, conditionally acceptable, and unacceptable. Each land use has a particular dBA range within each exterior noise exposure category. For residential uses, an exterior noise environment of less than 62.5 dBA L_{dn} or CNEL is considered "normally acceptable" while a noise environment of 62.5 to 77.5 dBA L_{dn} or CNEL is considered "conditionally acceptable." For neighborhood parks, the General Plan guidelines indicate that an exterior noise environment of less than 65 dBA L_{dn} or CNEL is considered "normally acceptable," between 65 dBA and 80 dBA L_{dn} or CNEL is considered "conditionally acceptable," and 80 dBA or greater is considered "unacceptable."

Regional and Local Regulations

Marin County Municipal Code

The Marin County Code stipulates the following regulation for construction-related noise:

Section 6.70.030 – Enumerated Noises.

(5) Construction Activities and Related Noise.

a. Hours for construction activities and other work undertaken in connection with building, plumbing, electrical, and other permits issued by the community development agency shall be limited to the following:
   i. Monday through Friday: seven a.m. to six p.m.
   ii. Saturday: 9 am to 5 pm
   iii. Prohibited on Sundays and Holidays (New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.)

b. Loud noise-generating construction-related equipment (e.g., backhoes, generators, jackhammers) can be maintained, operated, or serviced at a construction site for permits administered by the community development agency from eight a.m. to five p.m. Monday through Friday only.

c. Special exceptions to these limitations may occur for:

i. Emergency work as defined in Section 22.130.030 of this code provided written notice is given to the community development director within forty-eight hours of commencing work;
ii. Construction projects of city, county, state, other public agency, or other public utility;
iii. When written permission of the community development director has been obtained, for showing of sufficient cause;
iv. Minor jobs (e.g., painting, hand sanding, sweeping) with minimal/no noise impacts on surrounding properties; or
v. Modifications required by the review authority as a discretionary permit condition of approval.

Marin Countywide Plan

The Built Environment Element of the Marin Countywide Plan contains the following goal, policy, and implementing program that relates to noise and is applicable to the project (Marin County , 2007).

Goal NO-1: Protection from Excessive Noise. Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.

> ***Policy NO-1.3: Regulate Noise Generating Activities***. Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.
>
> > *Implementing Program NO-1.i: Regulate Noise Sources* - Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement the provisions of the plan.

Town of Ross Municipal Code

The following code of the Town of Ross Municipal Code related to noise is applicable to the project (Town of Ross, 2020).

Chapter 9.20 Unnecessary Noise

> **9.20.035 Construction.** (a) It is unlawful for any person or construction company within the town limits to perform any construction operation before eight a.m. or after five p.m., Monday through Friday of each week and not at any time on Saturday, Sunday, or the other holidays listed in Section 9.20.060.

Town of Ross General Plan
The following goal and policy of the Ross General Plan related to noise is applicable to the project.

Goal 5. Protecting Community Health and Safety, and Preparing for Emergencies.

> **5.10 Traffic and Construction Noise**. Require mitigation of construction and traffic noise impacts on the ambient noise level in the Town.

3.10.6 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would result in one or more of the following:

a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
b. Generation of excessive groundborne vibration or groundborne noise levels.
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would expose people residing or working in the project area to excessive noise levels.

Approach to Impact Analysis

The following analysis discusses the significant impacts of the project related to noise and vibration. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.10.7 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (c).** The project is not located within an airport land use plan, and the nearest public airport, the Gnoss Field Airport in Novato, is located approximately 12 miles from the project. The nearest private airport, the San Rafael Airport in San Rafael, is located approximately 4 miles from the project. Therefore, the project would not result in any airport-operations-related safety hazard for people residing or working in the project area.

Impacts Analyzed

	Significance Determination
Impact 3.10-1: The project could result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

The project is located in a suburban residential area. Noise sources in the project vicinity include vehicle traffic on Sir Francis Drake Boulevard, Lagunitas Road, and College Avenue (approximately 120 feet east of upper Unit 3, crossing Unit 4, and crossing where Units 2 and 3 meets, respectively); traffic along adjacent roadways; and passing walkers, runners, and bicyclists along Bike Route 20. Construction of the project would temporarily generate noise during the seven months of active construction. Construction activities would occur on weekdays between the hours of 8:00 a.m. and 5:00 p.m. No nighttime or weekend construction activities would occur as part of the project.

Construction noise is regulated by the Town of Ross and Marin County Municipal Codes. Town of Ross Municipal Code Section 9.20.035 and Marin County Municipal Code Section 6.70.030(c) outline the allowable construction hours within each jurisdiction. Table 3.10-6 below lists the hours and times when construction is allowed in each jurisdiction.

Table 3.10-6 Town of Ross and Marin County Municipal Code Construction Requirements

Jurisdiction	Weekdays	Saturdays	Sundays	Federal Holidays
Marin County	8:00 a.m. to 5:00 p.m.	Construction not allowed	Construction not allowed	Construction not allowed
Town of Ross	8:00 a.m. to 5:00 p.m.	Construction not allowed	Construction not allowed	Construction not allowed

Project construction would require heavy equipment, including graders, excavators, cranes, dump trucks, and smaller equipment to transport materials, clear vegetation, grade new work areas, and remove and install floodwalls.

Table 3.10-7 lists the equipment that would be used during construction and the associated noise levels at a reference distance of 50 feet from the noise source.

Construction phase noise levels are modeled using a national model and construction equipment database in the Roadway Construction Noise Model (RCNM) from the Federal Highway Administration (FHWA). A list of construction equipment anticipated to be used during each construction phase is provided in Table 3.10-7. Construction noise is calculated for each phase of construction using noise-generating equipment that could be operating simultaneously within the work sites. The results are the sum of noise levels that would be experienced by typical receptors at a given distance. Construction noise levels are estimated at 50 feet, 100 feet, and 200 feet from the construction work area. Table 3.10-8 shows the

equipment required for work during each construction phase and the estimated L_{eq} and L_{max} at 50, 100, and 200 feet.

Compliance with Noise Standards and Ordinances by Project Element

Unit 4 and Frederick Allen park Construction

The ambient noise levels in Unit 4 and at residences adjacent to Frederick Allen Park on Sir Francis Drake Boulevard is approximately 62.9 dBA L_{eq} (Table 3.10-4). Both Unit 4 and Frederick Allen Park are located within the Town of Ross where the Town of Ross Municipal Code and General Plan construction noise standards would apply. Construction noise would be generated during daytime hours (8 a.m. to 5 p.m.) when construction noise is exempt under the Town of Ross Municipal Code 9.20.035. The project would not conflict with Town of Ross Municipal Code due to the daytime construction period.

Project construction activities would generate noise that would result in a temporary increase in the ambient noise level to a maximum of 84.9 dBA L_{eq} at 50 feet for a period of a few days during concrete removal and 81.1 dBA to 81.4 dBA L_{eq} during other construction activities (Table 3.10-8). The Town of Ross General Plan requires mitigation for construction noise impacts when construction noise substantially exceeds the ambient noise level. The temporary increase in noise levels during construction in Unit 4 and at Frederick Allen park would be substantial (greater than 10 dBA) and therefore significant and require mitigation in accordance with the Town of Ross General Plan.

Table 3.10-7 Maximum Noise Levels Generated by Construction Equipment

Equipment	L_{max} (dBA) at 50 feet
Boom truck/cherry picker[a]	85
Concrete truck and boom pump[b]	82
Concrete saw	90
Crane	85
Drill[c]	85
Dump trucks	84
Excavator (small and medium)	85
Flatbed trucks	84
Generators	82
Air compressors	80
Grader	85
Jackhammer	85
Hoe Ram	90
Loader[d]	80

Equipment	L_{max} (dBA) at 50 feet
Pickup trucks (small and large)	55
Pump	77
Roller/Compactor	85
Paver	85
Silent piler[e]	Less than 62

Notes:

[a] Crane is used to represent noise from a boom truck/cherry picker.

[b] Concrete pump truck is used to represent noise from a concrete truck and boom pump.

[c] Auger drill rig is used to represent noise from a drill.

[d] Front-end loader is used to represent noise from a loader.

[e] Noise level is estimated to be 61.5 dBA at 16 meters (52 feet) with eco mode on.

Source: (FHA, 2017; Giken, n.d.)

Table 3.10-8 Estimated Noise from Equipment Required for Construction Phases

Construction Phase	Equipment	Distance from Construction Work Area	L_{eq} (dBA)	L_{max} (dBA)
Concrete channel removal	Excavator, loader, hoe ram[a], dump truck	50	84.9	90.3
		100	78.9	84.3
		200	72.9	78.2
Bank stabilization Floodwall installation	Excavator, concrete pump, cement truck, compressor	50	81.1	81.4
		100	75.1	75.4
		200	69.0	69.4
Habitat enhancement Fish ladder removal Fish pools construction	Excavator, loader, concrete pump, cement truck	50	81.4	81.4
		100	75.4	75.4
		200	69.3	69.4
Pump station construction	Crane, drill, concrete pump, cement truck, compressor	50	81.9	84.4
		100	75.9	78.3
		200	69.8	72.3

[a] It is assumed that a hoe ram could be used to remove concrete instead of a jackhammer. A hoe ram has a noise level of 90 dBA at 50 feet, which is higher than a jackhammer (85 dBA at 50 feet). Therefore, a hoe ram is used to conservatively estimate noise from concrete channel removal activity.

Source: (FHWA, 2017).

The District would implement **Mitigation Measure 3.10-1: Construction Noise Reduction Plan** to reduce noise levels and impacts. Mitigation Measure 3.10-1 specifies the requirements of the noise-reduction plan, including notification of nearby residents and use of noise barriers to reduce noise levels at adjacent sensitive receptors. Barriers that are correctly placed and well-designed would be expected to reduce construction equipment noise levels by 9 to 10 dBA. The maximally affected receptors are residents living adjacent to Frederick Allen Park, where concrete removal would occur for a few days and grading and heavy equipment use would last up to seven months. Residents adjacent to Frederick Allen Park and Unit 4 are located on Sir Francis Drake Boulevard. Ambient noise levels on Sir Francis Drake Boulevard are similar to, and likely higher than, the noise levels on Lagunitas Road due to the higher volume of traffic on Sir Francis Drake Boulevard. With implementation of Mitigation Measure 3.10-1, construction noise levels would be reduced approximately 9 to 10 dBA. Because Mitigation Measure 3.10-1 includes noise reduction measures that would reduce the noise impact on ambient noise levels in the Town of Ross, the construction noise would be consistent with the Town of Ross General Plan requirements and the impact would, therefore, be less than significant with mitigation.

Lower Unit 3 and Unit 2 Construction Floodwalls and Fish Pools

Lower Unit 3 and Unit 2 construction areas are located within Marin County where the Marin County Municipal Code and Countywide Plan noise standards would apply. The Marin County Municipal Code allows for construction noise during the hours of 8 a.m. to 5 p.m. Monday through Friday. All construction would occur during these hours and would not conflict with the noise standards in the municipal code. The Marin Countywide Plan requires preparation of a noise reduction plan for projects generating significant construction noise. Installation of floodwalls and construction of eleven larger fish pools in lower Unit 3 and Unit 2 would proceed along the channel in a linear fashion. While the overall duration for installation of the three segments of floodwall and construction of fish pools would last several weeks, construction in each area would last a few days. The impacts from floodwall installation and fish-pool construction noise would be less than significant due to the very short duration of construction near each sensitive receptor.

Stormwater Pump Station

The proposed stormwater pump station would be located approximately 100 feet from the nearest residential structure or College of Marin buildings. Construction of the stormwater pump station would occur between 8 a.m. and 5 p.m. Monday through Friday and would not conflict with the noise requirements in the Marin County Municipal Code. Noise levels from stormwater pump station construction would be approximately 75.9 dBA L_{eq} at a distance of 100 feet during daytime construction hours (8 a.m. to 5 p.m.). Ambient noise levels at the stormwater pump station are likely slightly less than at Lagunitas Road (62.9 dBA L_{eq}) because the stormwater pump station is removed form Frederick Allen Park but is subject to traffic, including traffic to the adjacent College of Marin. Construction of the stormwater pump station would result in a substantial increase in ambient noise levels (greater than 10 dBA) at nearby sensitive receptors during daytime hours for up to six weeks. The increase in noise would be significant. Because the Countywide Plan requires implementation of a noise reduction plan for projects that generate significant construction noise, and the project would generate significant

construction noise, the impact would be significant. The District would implement **Mitigation Measure 3.10-1: Construction Noise Reduction Plan** to reduce noise levels and impacts. Mitigation Measure 3.10-1 requires preparation of a noise reduction plan that includes notification of nearby residents and use of noise barriers to reduce noise levels at adjacent sensitive receptors. Preparation of the noise reduction plan consistent with Mitigation Measure 3.10-1, would reduce significant construction noise and would comply with the Countywide Plan. The impact from temporary construction noise generation at the stormwater pump station would, therefore, be less than significant with mitigation.

Lower College of Marin ~~Corte Madera Creek~~ Concrete Channel Removal

The concrete channel removal in Unit 2 would require construction for up to six weeks. Dewatering would require installation of sheet piles. The sheet piles would be installed with a silent piler that would generate noise levels up to 62 dBA. The nearest sensitive receptors are located approximately 500 feet from the construction area. Construction activities in the area could generate noise up to 63 dBA L_{eq} at the nearest receptors on Sir Francis Drake Boulevard. The temporary noise at sensitive receptors would be similar to ambient noise levels from traffic on Sir Francis Drake Boulevard, and the project would not cause a substantial increase in noise levels; therefore, the impact would be less than significant.

Construction Traffic Noise

In addition to on-site construction noise, off-site hauling and material deliveries associated with construction activities would occur along designated truck routes within the project vicinity. This increase in truck traffic compared to existing conditions would contribute incrementally to traffic noise along local streets. Truck noise levels depend on vehicle speed, load, terrain, and other factors. The effects of off-site truck noise would depend on the existing level of background noise at a particular sensitive receptor. It is anticipated that a maximum day of truck traffic from the project area would result in 93 one-way trips per day during fish-pool construction and activities at Frederick Allen Park. Several phases have overlapping construction time periods that could result in a higher number of peak daily truck trips of up to approximately 413 one-way trips accessing the project area. Worker travel to and from the construction site would account for a maximum of 20 one-way trips per day. Accounting for the overlap of construction phases, peak one-way worker trips could be up to 112 per day.

Haul truck routes would likely occur along U.S. Highway 101, Sir Francis Drake Boulevard, and other local roadways in the immediate vicinity of the project area. Noise associated with a single truck pass-by can be approximately 80 dBA at 50 feet (FHWA, 2006). However, it takes a doubling of traffic to increase average noise levels by only 3 dB, which is considered barely perceptible to the average person (Caltrans, 2013a). Since U.S. Highway 101 and the majority of Sir Francis Drake Boulevard experience elevated traffic levels, the worst-case worker and haul truck traffic of 525 one-way trips per day would not double traffic volume along these roadways and would therefore not result in a perceptible increase in traffic noise at existing sensitive receptor locations. The impact associated with traffic noise would be less than significant.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed stormwater pump station and testing of the new backup generator. Typical activities include sediment and debris removal, vegetation management, and regular inspection and as-needed repair of floodwalls or other structures. These activities may include the use of offroad equipment such as lawn mowers, backhoes, and loaders. The pumps for the stormwater pump station would be installed underground and are not anticipated to create perceptible noise at the nearest receptor. The pumps would only be operational during and immediately following storm events when creek levels exceed the height of the outfall pipe and the stormwater pump station is needed to avoid flooding. Power for the stormwater pump station will primarily be provided by a connection to the grid. A generator would also provide emergency backup power in the case of power failure when the stormwater pump station needs to operate. Operation of the backup generator would only occur during emergencies and during testing of the generator. Operation and maintenance activities for the project would be temporary and occur infrequently throughout the year and would not result in a permanent increase in noise; therefore, impacts would be less than significant.

Mitigation: Implement Mitigation Measure 3.10-1.

Mitigation Measure 3.10-1: Construction Noise Reduction Plan. The District would adhere to this requirement and develop a construction noise reduction plan in compliance with local regulations to include measures to reduce construction noise impacts. These measures shall include, but not be limited to, the following:

1. Distribute to the potentially affected residences and other sensitive receptors within 200 feet of project construction boundary a "hotline" telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise-disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant's name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project area of the construction schedule.
2. All construction equipment shall have intake and exhaust mufflers recommended by the manufacturers thereof. Further, pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof. In lieu of or in the absence of manufacturers' recommendations, the Director of Public Works shall have the authority to prescribe such means of accomplishing maximum noise attenuation as he deems to be in the public interest, considering the available technology and economic feasibility.

3. Maintain maximum physical separation between noise sources (construction equipment) and sensitive noise receptors. Separation may be achieved by locating stationary equipment to minimize noise impacts on the community.
4. Impact tools (e.g., jack hammers) used during construction activities will be hydraulically or electrically powered where feasible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used.
5. Use construction noise barriers such as paneled noise shields, barriers, or enclosures adjacent to noisy stationary equipment such as generators, air compressors, jackhammers, etc. Noise control shields shall be made featuring a solid panel and a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.

Significance after Mitigation: Implementing Mitigation Measure 3.10-1 would comply with the Town of Ross General Plan and Countywide Plan. The mitigation would reduce construction noise levels by requiring use of equipment that would reduce noise generation and use of sound barriers to reduce noise at sensitive receptors. The impact would be less than significant after mitigation.

	Significance Determination
Impact 3.10-2: The project would not result in generation of excessive groundborne vibration or groundborne noise levels.	**Construction: Less than Significant with Mitigation** **Operation and Maintenance: Less than Significant**

Overview

The Marin Countywide Plan and Town of Ross General Plan and relevant municipal codes do not address vibration or provide numerical thresholds for identifying groundborne vibration impacts. In the absence of local standards for construction equipment vibration, the evaluation presented below uses the vibration thresholds presented in Table 3.10-9 to assess the significance of groundborne vibration and noise impacts. For risk of architectural damage to historic buildings and structures, this analysis applies a threshold of 0.12 in/sec PPV (Caltrans, 2013b). The only historic structures located in proximity to the project include Lagunitas Bridge and Ross Town Hall, north of the Unit 4 construction area and beyond the limits of vibration effects from the project. A threshold of 0.3 in/sec PPV is used for all other buildings. The FTA provides an equation that may be used to estimate vibration at different distances based on a reference PPV of 25 feet (Table 3.10-10) for various construction equipment. Using the FTA equation, the distances at which vibration-generating construction equipment would be lower than the damage thresholds were calculated and compared to potential distances to receiving buildings.

Table 3.10-9 Vibration Thresholds

	Maximum Peak Particle Velocity (PPV), inches per section (in/sec)
Historic buildings and structures	0.12
All other structures	0.3

Note:

The vibration criteria are based on continuous or frequent intermittent sources, including impact pile drivers, compactors, crack and seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: (Caltrans, 2013b).

Table 3.10-10 Vibration Velocities for Construction Equipment

Equipment	Reference PPV at 25 feet (in/sec)	PPV at 5 feet (in/sec)	PPV at 30 feet (in/sec)
Large bulldozer[a]	0.089	0.523	0.073
Small bulldozer[b]	0.003	0.018	0.002
Jackhammer	0.035	0.206	0.029
Hoe ram	0.24	1.41	0.196
Loaded Trucks	0.076	0.446	0.062
Caisson Drilling	0.089	0.523	0.073
Silent piler[c]	0.05	0.294	0.041

Notes:

[a] Large bulldozer is used to represent vibration velocity for a medium excavator.

[b] Small bulldozer is used to represent vibration velocity for a small excavator.

[c] No vibration data are available for silent piler. Vibration data from the Fundex Tubex piling system were used to model vibration level as a "worst-case scenario" of pile installation vibration.

Source: (FTA, 2006).

Construction

Temporary sources of groundborne vibration during construction would result from operation of conventional heavy construction equipment such as an excavator, loaded haul trucks, and a jackhammer or hoe ram.

The nearest structures to the project are located approximately 30 to 60 feet from the project elements, with the exception of buildings located directly west of Frederick Allen Park. The nearest structure at Frederick Allen Park is located approximately three feet to the west of proposed floodwall. Table 3.10-10 summarizes typical vibration levels generated by heavy equipment applicable to the project at five feet and 30 feet distances. Assuming that a large

bulldozer[1] would be used during project construction, structures would be exposed to a vibration level of 0.029 in/sec at 30 feet from construction area. Structures in all project elements, except adjacent to Frederick Allen Park, would not be exposed to vibration levels that would exceed the established building damage threshold (0.3 in/sec) since the nearest structures are located at least 30 feet away from the construction area.

Grading activities and construction of the short floodwall in Frederick Allen Park could occur at as close as three feet from buildings. A large bulldozer would produce a PPV of 0.523 at five feet, and a loaded truck would produce a PPV of 0.446 at five feet (Table 3.10-10); these vibration levels exceed the threshold of 0.3 PPV, and the vibration impact is therefore significant. **Mitigation Measure 3.10-2 Vibration Reduction Measures** would reduce potentially significant impacts by requiring vibration monitoring during construction activities in Frederick Allen Park adjacent to buildings and requiring notification to residents and property owners of vibration-generating activity and potential consequences. Because the mitigation requires monitoring and specifies procedures to avoid exceeding the vibration threshold, groundborne vibration impacts would be less than significant with mitigation.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator, including sediment and debris removal, vegetation management, and regular inspection and as-needed repair of floodwalls or other structures. These activities would be temporary and may include the use of off-road equipment such as lawn mowers, backhoes, and loaders. These activities would occur at a greater distance from the nearest sensitive receptors than the construction. It is anticipated the vibration levels that occur during operation and maintenance activities would not exceed the established adverse human reaction threshold or the building damage threshold; therefore, this would result in a less-than-significant impact.

> **Mitigation:** Implement Mitigation Measure 3.10-2.
>
> **Mitigation Measure 3.10-2: Vibration Reduction Measures.** The District shall design the project to avoid intense vibration activities within five feet of the structures at Frederick Allen Park (e.g., avoid use of large bulldozer, jackhammer, hoe ram, or loaded trucks). If intense vibration generating activities cannot be avoided in proximity to structures, vibration monitoring shall be conducted during grading and floodwall construction activities in Frederick Allen Park to confirm vibration levels do not exceed vibration thresholds at the nearest receptors. If vibration levels approach the threshold of 0.3 PPV at the nearest structure, then construction practices shall be modified (i.e., use

[1] Vibration data are not available for excavator. Vibration data from bulldozer were used to model vibration level for excavator.

smaller types of construction equipment, operate the equipment in a manner to reduce vibration, or use alternate construction methods) so that the threshold is not exceeded.

Significance after Mitigation: Implementing Mitigation Measure 3.10-2 would reduce significant vibration impacts to a less-than-significant level by requiring the District implementation to avoid intense vibration in proximity to structures.

3.10.8 References

Caltrans. (2013a, September). Technical Noise Supplement to the Traffic Noise Analysis Protocol.

Caltrans. (2013b, September). Transportation and Construction Vibration Guidance Manual.

Cavanaugh, W. J., Tocci, G. C., & Wilkes, J. A. (2009, November 2009). Architectural Acoustics: Principles and Practice . John Wiley & Sons.

FHA. (2017, August 24). *Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors*. Retrieved September 25, 2020, from https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm

FHWA. (2006, January). Roadway Construction Noise Model User's Guide.

FHWA. (2017, June 28). *Roadway Construction Noise Model - RCNM*. Retrieved from https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/

FTA. (2006, May). Transit Noise and Vibration Impact Assessment .

FTA. (2006, May). Transit Noise and Vibration Impact Assessment .

Giken. (n.d.). *Silent Piler F101 for U Sheet Piles 400mm wide*. Retrieved October 15, 2020, from https://www.giken.com/en/wp-content/uploads/silentpiler_f101.pdf

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Town of Ross. (2007, June). Town of Ross General Plan.

USACE. (2010, December). Corte Madera Creek Flood Control Study Baseline Report .

3.11 Public Services

3.11.1 Introduction

This section describes existing public services in the vicinity of the project and evaluates the potential impacts of the project on public services (including fire and emergency, police and criminal justice, and public education services). Potential effects on parks as a public service are addressed in Section 3.12 Recreation. Similarly, Section 3.13 Transportation and Circulation, evaluates potential impacts regarding emergency access during construction. No scoping comments relevant to evaluation of public services were provided during the public scoping period.

3.11.2 Scoping Comments

Comments related to public services impacts were received during the public scoping process. These comments and the location where they are addressed in the public services analysis are provided in Table 3.11-1.

Table 3.11-1 Public Services Scoping Comments

Agency/Entity	Comment	Location in Public Services Section that Comment is Addressed
Garrill Page	Biking has become more and more popular form of recreation and for some people, of transportation. Unfortunately, the increase in popularity has meant increases in heedless behavior, traffic violations and increased speed that endangers pedestrians. Upgrading the multi-use path encourages greater use and abuse, requires more regulation, increased supervision, and added demands on Town staff and services as well as less privacy for town residents. The lengthy period of construction for the FAP Riparian corridor increases traffic disruption and inconvenience for Ross residents and drivers on SFD.	Section 3.11.6, Impact 3.11-1

3.11.3 Environmental Setting

Fire Protection and Emergency Services

The project is located within the Town of Ross and unincorporated Kentfield and would be serviced by the Ross Valley Fire Department (RVFD), Kentfield Fire Protection District (KFPD), and Marin County Fire Department. Unit 4 and upper Unit 3 are located in the Town of Ross and serviced by the RVFD. Lower Unit 3 and Unit 2 are located in unincorporated Kentfield and serviced by KFPD and the Marin County Fire Department. All RVFD and KFPD fire stations

could respond to fire and other needs for emergency services in either jurisdictional area, as needed.

Ross Valley Fire Department

The RVFD service area encompasses the Towns of San Anselmo, Ross, and Fairfax as well as the unincorporated Sleepy Hollow community. The Department provides fire suppression, emergency medical services, fire prevention and inspection, community education, hazardous material spill response, specialized rescue, and vehicle collision response and disaster response to its service area and neighboring areas of Marin County (RVFD, 2020)**.**

The RVFD has four fire stations within approximately 2.5 miles of the project. Fire Station 18 is located at 33 Sir Francis Drake Boulevard in Ross, approximately 0.2 mile from the project area. The historic Ross Fire Station was built by the Town of Ross in 1926. Fire Station 18 houses the Ross Valley Paramedic Authority transport ambulance, Medic 18, staffed with two paramedic firefighters. The station houses one structural firefighting engine and a reserve fire engine, which can be staffed by off-duty and volunteer personnel as needed (RVFD, 2020).

Kentfield Fire Protection District

The KFPD is a special district formed under the authority of the California Health and Safety Code. The KFPD services the communities of unincorporated Greenbrae, Del Mesa, Kentfield proper and Kent Woodlands, which includes lower Unit 3 and Unit 2 (KFPD, 2019)..

The KFPD Station is located at 1004 Sir Francis Drake Boulevard, approximately 0.5 mile from the project area. The KFPD is a member of the California Inter- County Mutual-Aid Plan and the Marin County Automatic and Mutual-Aid Plan, covering emergencies and disasters such as fires, floods, mass-casualty incidents, and earthquakes. All KFPD personnel are certified Hazardous Materials First Responders and Emergency Medical Technicians. The KFPD provides paramedic service through the Ross Valley Paramedic Authority Joint Powers Agreement (KFPD, 2020).

Marin County Fire Department

The Marin County Fire Department serves the unincorporated portion of Marin County's 521 square miles, including lower Unit 3 and Unit 2 which lie within the community of Kentfield (Marin County Fire Department, 2020). The nearest station is the Marin City Station at 850 Drake Avenue, Marin City, approximately 5 miles southeast from the project site (County of Marin, 2020).

Police and Criminal Justice Services

The Town of Ross Police Department and Marin County Sheriff Department provide police protection services to the project area. Both the Town of Ross Police Department and Marin County Sheriff Department could respond to situations in either jurisdictional area, as needed.

Town of Ross Police Department

The Town of Ross Police Department is located at 33 Sir Francis Drake Boulevard, which is along the left bank of Unit 4 and north of Lagunitas Road. The Department provides police services to the Town of Ross and unincorporated Kentfield (Town of Ross, 2020).

Marin County Sheriff Department

The Marin County Sheriff Department serves the unincorporated portion of Marin County's 521 square miles, including lower Unit 3 and Unit 2 which lie within the community of Kentfield (Marin County Sheriff's Office, 2020). The Marin County Sheriff Department headquarters are located at 3501 Civic Center Drive in San Rafael and has three substations located in Kentfield, Point Reyes, and Marin City. The closest substation is at 831 College Avenue in Kentfield, approximately 0.5 mile from the project area. Each substation's area is divided into patrol subareas, which are served by uniformed deputies in marked patrol units. Additional patrol units are assigned during high activity periods as needed.

Public Education Services

The College of Marin Kentfield Campus is located at 835 College Avenue, Kentfield, directly adjacent to the left and right bank of Unit 2 and adjacent to the left bank of Unit 3 along Corte Madera Creek. The College of Marin is a public community college and had an enrollment of 13,460 students for the 2018-2019 academic year (College of Marin, 2019).

Kent Middle School is located at 800 College Avenue, with the school's athletic fields located adjacent to Unit 2. Kent Middle School serves grades 5 through 8, with an enrollment of 560 students in the 2019-2020 academic year (Kent Middle School, 2020).

Ross School is located at 9 Lagunitas Road, approximately 0.25 mile from the right bank of Unit 4. Ross School serves grades K through 8 with an enrollment of 394 students in the 2018-2019 academic year (Education Data Partnership, 2020).

There are two public libraries in the project vicinity. The Jose Moya del Piño Library is in the Octagon House at the Marin Art and Garden Center at 30 Sir Francis Drake Boulevard in Ross, approximately 400 feet from the left bank of Unit 4. San Anselmo Public Library, located at 110 Tunstead Avenue, San Anselmo, is located approximately 1 mile north of the project area.

3.11.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

Although there are multiple federal laws, statutes, and regulations on public services that would generally apply to the project, the federal government and its agencies have delegated

the authority to implement and satisfy public service requirements to the state of California and its agencies, as discussed below.

State Regulations

California Master Mutual Aid Agreement
The California Master Mutual Aid Agreement is a framework agreement between the State of California and local governments for aid and assistance by the interchange of services and facilities, including but not limited to fire, police, medical and health, communication, and transportation services and facilities to cope with the problems of rescue, relief, evacuation, rehabilitation, and reconstruction. The California Master Mutual Aid Agreement provides funding for public services in the project area.

Regional and Local Regulations

Marin County Municipal Code
Chapter 16.16 Uniform Fire Code of the Marin municipal code establishes requirements for storage of flammable liquids and materials as well as the duties of the fire prevention bureau of the Marin County Fire Department.

Marin Countywide Plan
The following goals and policies in the Marin Countywide Plan are relevant to the public services that are serving the project area (Marin County , 2007).

Public Facilities and Services
Goal PFS-1: Adequate Public Facilities and Services. Provide basic public facilities to accommodate the level of development planned by cities and towns and the County.

Public Safety
Goal PS-1: Safe Neighborhoods. Ensure that county neighborhood remains safe places to live.

Goal PS-3: Effective Emergency and Disaster Preparedness. Provide proper emergency and disaster preparedness services through effective and coordinated emergency management plans and procedures.

> ***Policy PS-3.1: Plan Thoroughly for Emergencies.*** Ensure that the County, its citizens, businesses, and services are prepared for effective response and recovery in the event of emergencies or disasters.

3.11.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it would:

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
   i. Fire protection
   ii. Police protection
   iii. Schools
   iv. Parks
   v. Other public facilities

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to public services for the project. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.11.6 Impact Discussion

Impacts Analyzed

Impact 3.11-1: The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services. i. Fire protection ii. Police protection iii. Schools iv. Parks v. Other public facilities	**Significance Determination**
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

Police and Fire Protection

Project construction would occur over a period of up to seven months and would employ an average of 8-10 construction workers per day. Construction workers likely would come from within Marin County and other Bay Area counties. Construction workers who are residents of Marin County are currently being served by the existing county and individual city/town services, and thus would not represent an increase in demand for these services. While it is possible that some workers might temporarily relocate from other areas, the project is not expected to result in a substantial increase in the local population (as described in Section 3.16 Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics) and thus not expected to result in increased response times such that new or physically altered facilities would be required to maintain service. Incidents requiring law enforcement, fire protection, or emergency medical services could occur during construction. However, construction of the flood risk reduction project is not expected to generate a substantial increase in demand for these services. The construction would not require construction of new or physically altered facilities to maintain service. Therefore, the impact of project construction on fire and police services would be less than significant.

Schools

Temporary construction of the project would occur near schools in the project area, including immediately adjacent to the College of Marin and Kent Middle School and within 0.25 mile of Ross School. As described above, the project would not generate additional permanent employees or residents in the project area. Project construction is short-term in nature; therefore, it would not indirectly affect local schools as a result of employees moving into the area to work on the project. The concrete channel removal in lower Unit 2 would widen the channel and relocate and informal access path located on the left bank of Corte Madera Creek. The relocated access path would pass through a small portion of undeveloped land within College of Marin property. The relocated access path would not impact any College of Marin buildings or affect College of Marin operations because the relocated path would be located in an undeveloped area adjacent to the creek channel. Therefore, impacts to schools are considered less than significant.

Parks

As discussed in Section 3.12 Recreation, construction of the project would involve the temporarily closure of Frederick Allen Park including the Bike Route 20 within Unit 3. The public would not be able to access the park or pathway through the park during the construction period (up to seven months); however, access to the tennis courts would remain open. Bicyclists and walkers on the pathway would be redirected onto adjacent streets and detoured around the construction area. The detour would potentially reduce use of the pathway and temporarily increase use of other facilities. However, the detour would be short-term and pedestrian access would be restored following construction. Construction of the

project would not generate a need for new park facilities. The impact of project construction on parks would be less than significant.

Other Public Facilities

Project construction is short-term in nature; therefore, it would not indirectly affect nearby libraries as a result of employees moving into the area to work on the project. Construction of the project would not result in the need to construct new libraries or other public facilities and no impacts would occur. Therefore, impacts on other public facilities are considered less than significant.

Operation and Maintenance

Police and Fire Protection

The project does not involve the construction of residences or businesses and would not result in a permanent increase in the local population. During operation, project facilities would be unmanned and would not require a permanent workforce. The project is located in proximity to (and already served by) public services and would be constructed in accordance with all applicable current fire codes and public safety standards. Therefore, operation of the proposed project would not substantially increase the service population (or the number of service calls) within the area and would not necessitate the construction of a new police or fire station or alteration of an existing one in order to meet performance objectives. The project involves improvements along Corte Madera Creek to increase the capacity of the channel and reduce flooding in the Town of Ross and Kentfield areas. The project would also realign the Bike Route 20 multi-use path through Frederick Allen Park to provide access to the creek. Usage of Bike Route 20 is expected to be similar to existing conditions because the multi-use path is an existing pathway. Incidents requiring law enforcement or emergency services, or Town of Ross staff, are not expected to change compared to existing conditions. However, implementation of the proposed flood reduction measures (installing flood walls, stabilizing creek slopes, widening and removal portions of the concrete channel) would enhance safety along Corte Madera Creek and would likely reduce the number of service calls related to flooding emergencies, resulting in a beneficial impact to public services. Overall, the impact of project operation on fire and police services would be less than significant.

Schools

As discussed above, the project would not generate permanent employment and would not cause an increase in local population that would cause increased demand for local schools. The concrete removal in lower Unit 2 would create a new access path at the College of Marin. The new access path would be maintained by the Marin County Flood Control and Water Conservation District (District) and would not put additional demand on public schools. The impact would be less than significant.

Parks

The project includes modifications and alterations to Frederick Allen Park. The modifications to Corte Madera Creek and Frederick Allen Park would not generate additional demand for parks. The modified park would provide seating areas and a realigned pathway for continued

recreational use. The modified park would also allow for additional interaction with the creek through creek viewing areas and a pathway to the creek. The District would provide maintenance of the creek and pathway over the project life. The project would, therefore, not generate additional demand for park services or maintenance of park facilities; therefore, the impact would be less than significant.

Other Services

The project is proposed to provide enhanced flood risk reduction and stormwater management benefits to the communities of Kentfield and Ross. The project would have a beneficial impact on public stormwater and flood control services. The project would have no adverse effect on other public services.

Mitigation: None required.

	Significance Determination
	Construction: Less than Significant
Impact 3.11-2: The project would not result in the need for increased maintenance of public facilities, including roads.	**Operation and Maintenance: Less than Significant**

Construction

As described above in Impact 3.11-1, the project would not result in population growth and associated increased use of public facilities during construction. Construction of the project would last up to seven months and would employ an average of 8 to 10 construction workers per day who would not be expected to generate use or maintenance of public facilities. Heavy trucking activity is expected to occur during the material hauling and demolition phase of construction but would temporarily occur over the span of seven months. The haul trucks would not exceed the capacity of area roadways and would not have a long-term impact on the quality of the surrounding roadways. Impacts to public facilities and roads would be less than significant.

Operation and Maintenance

The project involves the construction of a new floodplain area within Frederick Allen Park, realignment of the pathway through the park, and construction of new retaining wall and floodwall segments along either side of the channel and at the margin of the park. The project elements that will be constructed are considered public facilities. The new floodplain area and realigned Corte Madera Creek are being designed to be sustainable. Limited maintenance other than vegetation management and inspections and maintenance of any erosion repairs is anticipated. The District is currently responsible for maintenance of the concrete channel and pathway within the park. The proposed concrete removal and channel modifications will be more resilient to seismic events and less at risk of long-term damage that would risk structural failure. The project will reduce the long-term risk of major maintenance actions to replace the concrete or other major structural maintenance such as reconstruction over time. The long-term impact from maintenance of the public facility will be less than significant.

Mitigation: None required.

3.11.7 References

College of Marin. (2019, December). Fast Facts Academic Year 2018-2019.

County of Marin. (2020). Marin City Fire Station. Retrieved July 6, 2020, from https://www.marincounty.org/depts/fr/divisions/operations/stations/marin-city

Education Data Partnership. (2020). Ross Elementary. Retrieved July 6, 2020, from https://www.ed-data.org/district/Marin/Ross-Elementary

Facebook. (2020). Kentfield Fire Protection District. Retrieved August 31, 2020, from https://www.facebook.com/pages/category/Fire-Station/Kentfield-Fire-Protection-District-358454077591717/

Kent Middle School. (2020). About Us. Retrieved July 6, 2020, from https://kent.kentfieldschools.org/about-us/

KFPD. (2019). *District Boundary*. Retrieved November 18, 2020, from Kentfield Fire Protection District Administration: http://www.kentfieldfire.org/administration/district-boundary

KFPD. (2020). Kentfield Fire Protection District. Retrieved from http://www.kentfieldfire.org/administration/about

Marin Catholic High School. (2020). At a Glance. Retrieved July 6, 2020, from https://www.marincatholic.org/about/at-a-glance

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

Marin County Fire Department. (2020). Marin County Fire Department District 3 Report. Retrieved July 6, 2020

Marin County Sheriff's Office. (2020). About Us. Retrieved September 21, 2020, from https://www.marinsheriff.org/about-us

RVFD. (2020). About Us. Retrieved July 1, 2020, from https://www.rossvalleyfire.org/about

Town of Ross. (2020). Personnel. Retrieved from https://www.townofross.org/police/page/personnel

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3.12 Recreation

3.12.1 Introduction

This section presents and discusses the potential for the project to adversely impact recreational facilities and activities in the project area. This section provides an overview of the environmental and regulatory setting that applies to recreational resources within the project area and presents and discusses potential project impacts and appropriate mitigation measures, as necessary.

3.12.2 Scoping Comments

Comments related to recreation impacts were received during the public scoping process. These comments and the location where they are addressed in the recreation analysis are provided in Table 3.12-1.

Table 3.12-1 Recreation Scoping Comments

Agency/Entity	Comment	Location in Recreation Section that Comment is Addressed
Michael Wanger	Will the pedestrian path between (a) the Flood Control access at the end of Locust Avenue and (b) the Kentfield Hospital Bridge be preserved?	Section 3.12.6, Impact 3.12-1
Michael Wanger	Will the foot path on the south side of the creek, which currently runs downstream from the Stadium Way footbridge, connect to the downstream section of the path as it does now? This is a major access way.	Section 3.12.6, Impact 3.12-1
Jeff Abend	Bike path is a critical artery for many people in the area. How will the bike path be impacted? Will it be closed at all?	Section 3.12.6, Impact 3.12-1
Marta Osterloh	What are the plans for recreational opportunity?	Section 3.12.6, Impact 3.12-1
Garril Page	Ross is distinguished by its trees: the high canopy overlays the town, creating a unique character immediately evident on entering Ross' shaded streets. FAP is Ross' urban forest, adjacent to a major arterial, yet a peaceful and relatively serene oasis on even the hottest days.	Section 3.12.6, Impact 3.12-3

3.12.3 Environmental Setting

Regional Setting

The project includes improvements to Corte Madera Creek within the Town of Ross and unincorporated Kentfield within Marin County.

The project is located within the Corte Madera Creek watershed, in which a varied range of recreational opportunities is available, including hiking, biking, picnicking, wildlife viewing,

sightseeing, field sports, and other public enjoyment opportunities. Recreational resources within the watershed serve Marin County and the greater Bay Area.

There are dozens of public parks in the watershed, including neighborhood parks, community parks and school playgrounds as well as over 5,700 acres of open space managed by the Marin County Open Space District and Marin Municipal Water District.

The Marin County Parks Department supports recreational opportunities at 34 open space preserves, four regional parks, and 27 community park facilities; three paved multi-use paths; a system of fire-protection roads and trails; recreational programs; environmental education programs; and volunteer programs. Parks in Marin County receive over two million visitors annually (Marin County Parks and Open Space Department, 2008).

Project Setting

Table 3.12-2 presents a list of parks and recreational facilities within these areas. Figure 3.12-1 shows the locations of the major parks, open space, and recreational facilities.

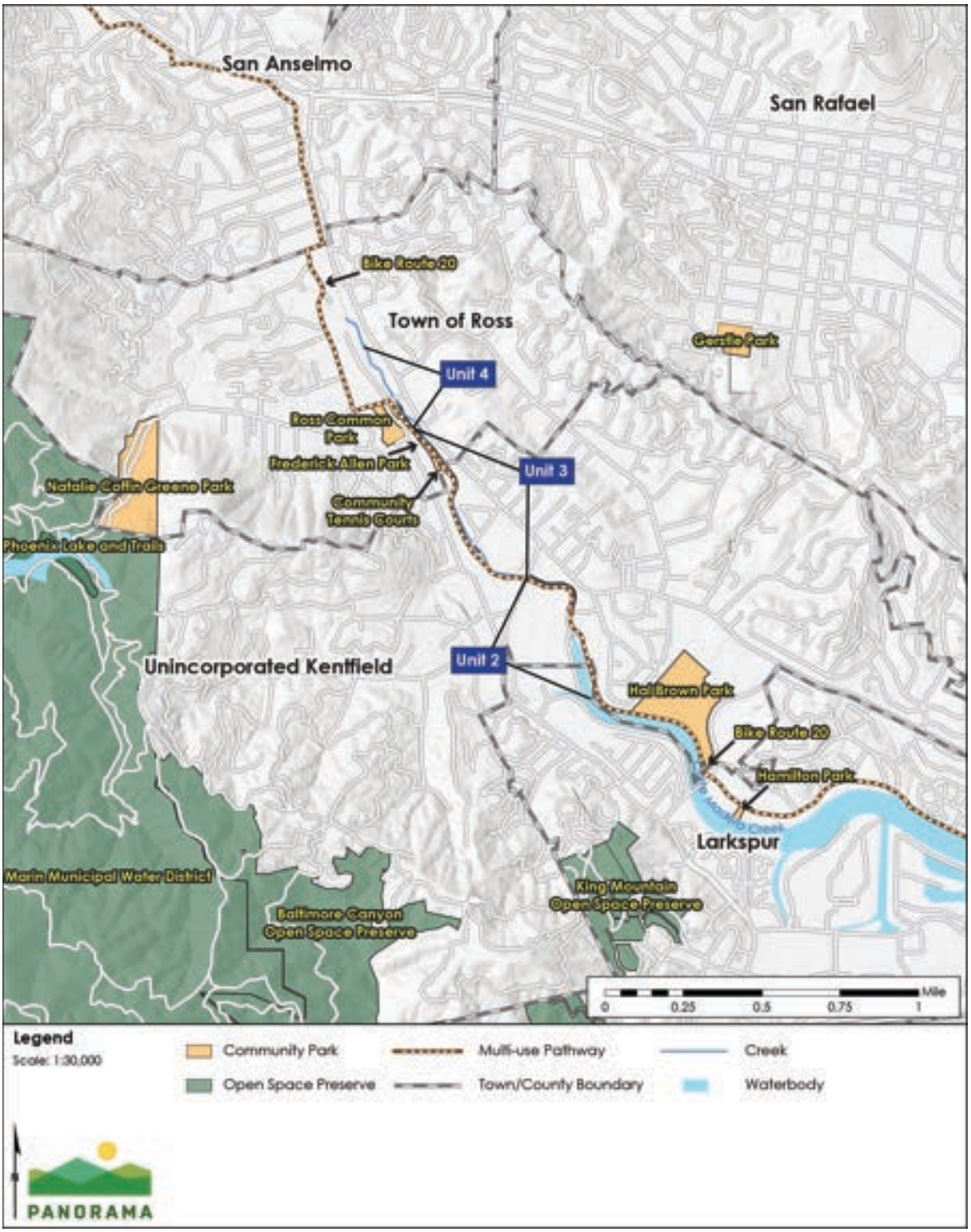
Town of Ross (Units 4 and 3)

Parks

Recreational facilities in the Town of Ross in the immediate vicinity of Units 4 and 3 are shown in Figure 3.12-2. Frederick Allen Park is located within the project area at the upper end of Unit 3. Frederick Allen Park is a linear park, located just south of the post office, owned and maintained by the Town of Ross. Within the project area, Frederick Allen Park contains trees, a pedestrian pathway, and benches for seating. Tennis courts, managed by the Town of Ross, are located within Frederick Allen Park on the right bank of the creek. Frederick Allen Park is used by bicyclists and walkers traveling along Bike Route 20. Corte Madera Creek is within a concrete channel adjacent to the park and is separated from the park by a fence that generally screens views of the concrete channel from the park.

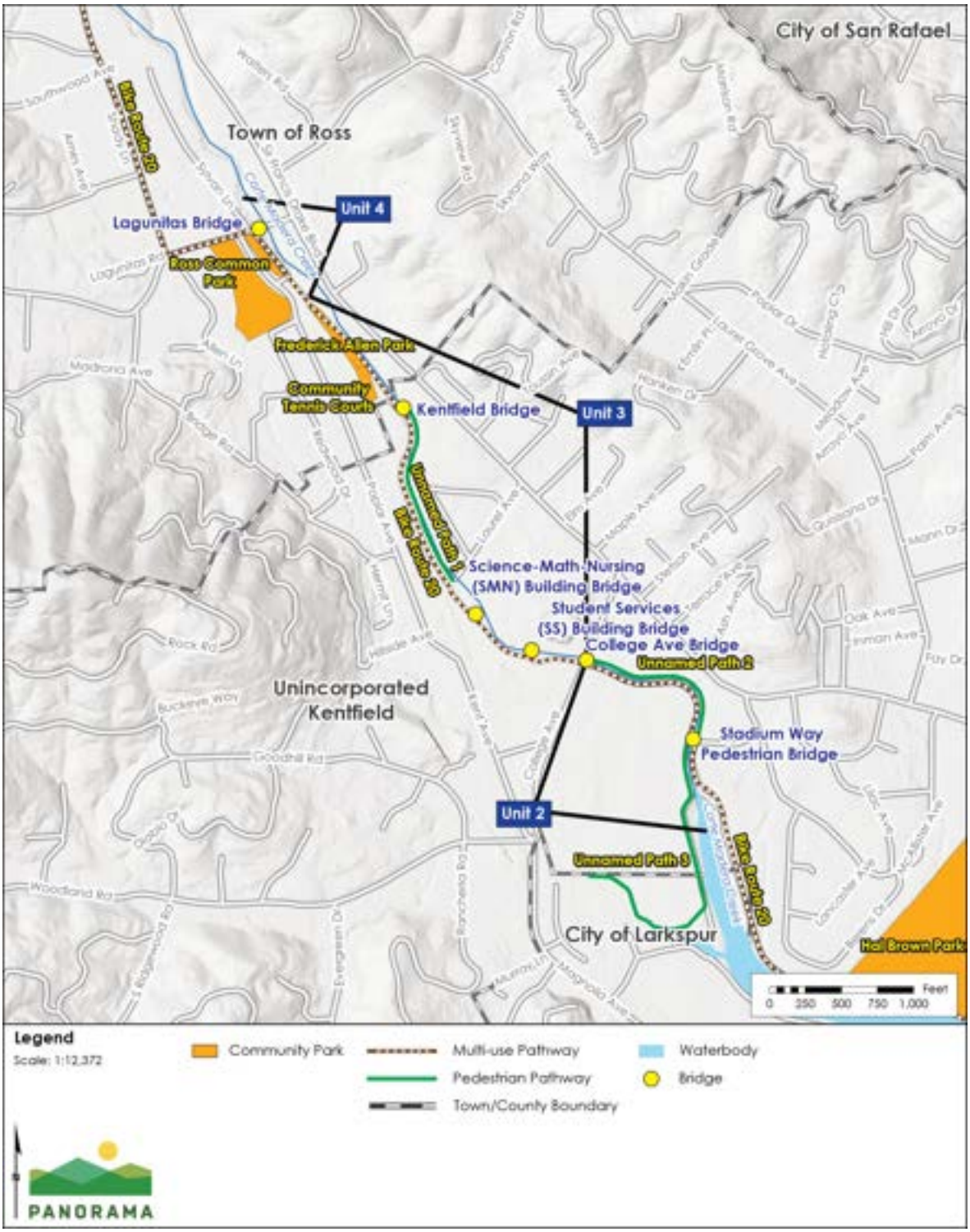
Ross Common Park is a 5-acre park with open space and recreational fields. Ross Common Park is located approximately 150 feet west of Corte Madera Creek. The Town of Ross conducts numerous community events throughout the year within Ross Common Park.

Figure 3.12-1 Recreational Facilities



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Local, State and Federal Government Agencies and Special Districts in Marin County California 2017, Local Governments in Marin County, California 2019, US Geological Survey 2013)

Figure 3.12-2 Parks and Recreational Facilities in the Project Area



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Golden Gate National Parks Conservancy 2018, Local, State and Federal Government Agencies and Special Districts in Marin County California 2017, Local Governments in Marin County, California 2019)

Table 3.12-2 Parks and Recreational Facilities Located near the Town of Ross and Kentfield Area

Name of Park or Facility	Park Type	Managing Agency
Baltimore Canyon Open Space Preserve	Open space preserve	County Open Space District
Bike Route 20	Multi-use pathway	County Parks
Frederick Allen Park	Community park	Town of Ross
Gerstle Park	Community park	City of San Rafael
Hal Brown Park	Community park	County Parks
Hamilton Park	Community park	City of Larkspur
King Mountain Preserve	Open space preserve	County Open Space District
Marin Municipal Water District open space	Open space preserve	Marin Municipal Water District
Natalie Coffin Greene Park	Community park	Town of Ross
Phoenix Lake and Trails	Open space preserve	Marin Municipal Water District
Ross Common Park	Community park	Town of Ross
Community tennis courts	Tennis courts	Town of Ross

Sources: (Marin County Parks and Open Space Department, 2008; ESA, 2018)

Bicycle and Pedestrian Paths

Bike Route 20 (also known as Corte Madera Creek Pathway) is located adjacent to Frederick Allen Park and the Corte Madera Creek channel within the Town of Ross. Bike Route 20 is a biking and pedestrian pathway that runs from Larkspur Ferry Terminal to the Town of Fairfax (Marin County Bicycle Coalition, 2008). The segment of Bike Route 20 adjacent to Frederick Allen Park in the project area consists of an off-street paved multi-use path. Bike Route 20 transitions from an off-street multi-use path to an on-street bikeway adjacent to Unit 4.

Unincorporated Kentfield (Units 3 and 2)

Parks

Hal Brown Park is located approximately 0.25 mile south of the terminus of Unit 2, directly adjacent to the left bank of Corte Madera Creek. The park is a 27-acre community park and includes walking paths along Corte Madera Creek, picnic tables, a playground, an amphitheater, and large turf fields.

Bicycle and Pedestrian Paths

Bike Route 20 consists of an off-street paved multi-use path adjacent to Units 2 and 3. Bike Route 20 is located on the right bank of Corte Madera Creek from the Town of Ross through Kentfield. Bike Route 20 crosses over Corte Madera Creek to the left bank at the Stadium Way pedestrian bridge and continues along the left bank as an off-street paved multi-use path to Bon

Air Road. Bike Route 20 within Units 2 and 3 is heavily trafficked by pedestrians and bicyclists, including commuters.

Several unofficial pedestrian paths are located adjacent to Corte Madera Creek, opposite Bike Route 20. While the unofficial pedestrian paths are not publicly maintained recreational facilities, they are used by the local community for walking and running and are therefore considered as recreational resources in the area. The unnamed pedestrian paths are shown on Figure 3.12-2. An unnamed pedestrian path is located between Kentfield Hospital and the terminus of Laurel Avenue (unnamed path #1) and also between the southwest intersection of College Avenue and the creek and the Stadium Way Pedestrian Bridge (unnamed path #2). An additional unnamed trail begins on the left bank of the Stadium Way Pedestrian Bridge and continues south where it loops south of the College of Marin football field and veers north to the parking area (unnamed path #3). While these are not official paths, they are utilized by pedestrians.

Public Education Recreational Areas
The Adaline E Kent Middle School and the College of Marin include recreational areas located adjacent to the right bank of Corte Madera Creek in the community of Kentfield. The middle school has a school playground, including basketball courts. The College of Marin has soccer fields, a running track, tennis courts, and volleyball courts.

3.12.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

No federal laws or regulations for recreation are applicable to the project.

State Regulations

No state laws or regulations for recreation are applicable to the project.

Regional and Local Regulations

Marin Countywide Plan
The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007).

Goal PK-1: A High-Quality Parks and Recreation System. Provide park and recreation facilities and programs to meet the various needs of all county residents.

> ***Policy PK-1.1: Conduct and Coordinate Park Planning.*** Develop park and recreation facilities and programs to provide active recreation, passive enjoyment, and protection of natural resources as a complement to local, state, and national parks and open space in Marin County.

Policy PK-1.2: Consider User Needs, Impacts, and Costs. Plan and develop any needed new park and recreation facilities and programs to meet the desires of the community and protect environmental resources.

Policy PK-1.3: Protect Park Resources from Impacts of Climate Change. Identify strategies to protect park resources from the effects of climate change, such as violent weather, plant loss, or change due to moisture and temperature changes and sea level rise.

Town of Ross General Plan

The following recreational goals, policies, and action in the Town of Ross General Plan are relevant to the project (Town of Ross, 2007).

Goal 1: An Abundance of Green and Healthy Natural Systems

Goal 8: A Beautiful, Safe and Close-Knit Community

Policy 8.4 Downtown and Ross Common. Maintain the Town-owned Ross Common areas linked to uses and activities at Ross School, and linked to the Town's downtown area as the central recreation, gathering and local shopping area of Ross. Maintain the downtown area as an attractive, pedestrian-friendly, small retail/business area. Encourage smaller-scale housing units mixed with commercial uses.

Policy 8.6 Gathering Places. Encourage and enhance community gathering places such as downtown, the Ross Common and the post office. Support the activities of Ross Recreation, Ross School, and the Marin Art & Garden Center.

Action 8.A Prepare a Downtown Area Plan. Develop a plan for the Downtown area as a "Special Planning Area" (see Land Use Plan) to include the Downtown commercial area, parking area through the post office to Lagunitas Avenue, and Ross Common. The plan would include: (1) street design improvements;(2) parking; (3) potential uses, including opportunities for limited housing; (4) design guidelines; (5) pedestrian and bicycle access—including access to Frederick Allen Park and Kentfield Rehabilitation Hospital; and, (6) outdoor gathering areas.

Kentfield/Greenbrae Community Plan

A major goal of the Kentfield/Greenbrae Community Plan is to preserve the physical and cultural characteristics of the major institution uses in the Kentfield/Greenbrae Community Plan, which includes open space parks.

The project is located within Subarea H Public Facilities of the Kentfield/Greenbrae Community Plan. The following conservation development standards in the Kentfield/Greenbrae

Community Plan, Subarea H, are relevant to recreation (Kentfield/Greenbrae Community Planning Group and Marin County Planning Department, 1987):

6. The vacant land east of Stadium Way bordered by McAllister Avenue and the Corte Madera Creek Channel should be considered for use as a community park. The portion of the upland south of the fenced ecology area is a seasonal wetland with large stands of pickleweed. This entire area should be protected in public open space with no destruction of wetlands or the vegetation bordering the creek. Passive community use (benches, etc.) should be confined to the grassy area adjacent to the bike path and people use of the densely vegetated area should be confined to walking the existing paths that meander through the trees. This area borders the left bank of the creek in Unit 2.

3.12.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
b. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Given the specific location and design of the project, impacts are analyzed in this section relative to the following additional threshold, which is not listed in Appendix G:

c. Affect existing recreational opportunities.

Approach to Impact Analysis

The following analysis discusses the potentially significant impacts of the project on recreation. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.12.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.12-1: The project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

Construction of the project would be short term (less than seven months) and would not induce population growth and associated increase in the use of existing parks or other recreational facilities such that physical deterioration of the facilities would occur or be accelerated. Construction of the project would involve the temporary closure of Frederick Allen Park, the segment of Bike Route 20 adjacent to Frederick Allen Park, and unnamed paths #1, #2, and #3 during construction of project components. These impacts are discussed in detail below.

Unit 4 Fish Ladder Removal and Grading

No recreational facilities are located within the project area of disturbance in Unit 4; therefore, no recreational facilities would be affected by project construction in Unit 4.

Unit 3 Frederick Allen Park

Some temporary impacts would occur to Bike Route 20 during construction as portions of the paths would be used for construction access. The Bike Route 20 segment within Frederick Allen Park would be temporarily closed during project construction, for a period of approximately seven months. Where the pathway is closed within Frederick Allen Park, a detour would be established to divert bicyclists onto Kent/Poplar Avenue from the College of Marin parking lot to Ross Common, as shown on Figure 3.12-2. The tennis courts and pedestrian access to the tennis courts at Frederick Allen Park would remain open throughout the duration of construction. While construction would temporarily remove portions of the pathway available to the public, users could utilize the detoured route. Path usage is expected to remain the same during construction. Temporary closures of the pathway are not expected to shift existing recreational use of the pathway to other nearby recreational facilities. Access along Bike Route 20 through Frederick Allen park would be restored to the realigned pathway once construction of Frederick Allen Park is complete.

The project involves removal of the concrete channel and widening of the channel within Frederick Allen Park. Temporary closure of the park for a period of approximately seven months would make the park unavailable to the public. Under existing conditions, Bike Route 20 through the park is heavily trafficked. While there are benches within the park, many users are pedestrians and bicyclists passing through on Bike Route 20 who do not linger in the park. Temporary closure of the park is not expected to result in higher use of nearby recreational facilities to a level that could cause physical deterioration of those facilities. Bicyclists and pedestrians using Bike Route 20 would be able to use the detoured route instead

of the pathway, and access to the tennis courts south of the park would be maintained. Following construction, Frederick Allen Park would reopen to the public.

Units 3 and 2 Floodwall Segments and Stormwater Pump Station
Temporary impacts would occur along unnamed and unofficial paths #1 and #2 during construction as portions of the path would be closed during construction of the floodwalls and for construction access. Users would be able to use the majority of Bike Route 20 and a detour route during construction closures of the unnamed paths #1 and #2, and access along Corte Madera Creek is expected to be maintained during construction. Temporary closure of unnamed path #1 and #2 would shift the existing recreational use of the path to Bike Route 20 and the associated detour route; however, due to the temporary closure, unofficial nature of the paths, and the lower number of users in comparison to Bike Route 20, any temporary increase in the use of Bike Route 20 would be negligible. The increase in use would not cause substantial physical deterioration of Bike Route 20, and impacts would be less than significant.

Unit 2 Lower College of Marin Concrete Channel Removal
A portion of unnamed and unofficial path #3 located within the construction work area would be closed during the six-week construction period for the concrete channel removal in lower Corte Madera Creek. Users would be able to use Bike Route 20 during construction.

The shift in users from unnamed path #3 to Bike Route 20 would not be substantial given that these paths are unofficial and do not see a high volume of users. The minimal potential increase in use of Bike Route 20 as a result of the six-week construction closure of unofficial path #3 would not cause substantial physical deterioration of Bike Route 20; therefore, the construction impact from Unit 2 concrete channel removal on recreational facilities would be less than significant.

Operation and Maintenance
The proposed project would upgrade existing flood-control infrastructure to reduce the risk of flooding along Corte Madera Creek, which is not a land use that would draw people to the area or increase the use and associated physical deterioration of recreational facilities. The proposed project would not create any permanent employment and is not expected to induce population growth that would in turn increase the use of the existing parks or other recreational facilities such that physical deterioration of the facilities would occur or be accelerated. Impacts from increased use of existing facilities would be less than significant. The analysis below is focused on the changes to the existing recreational facilities that would occur as a result of the project and the potential for those modifications to cause physical deterioration of recreational amenities.

Unit 4 Fish Ladder Removal and Grading
No recreational facilities are located within Unit 4; therefore, no recreational facilities would be affected by project operation in Unit 4.

Unit 3 Frederick Allen Park

Project elements within Frederick Allen Park include the removal of the existing concrete channel and construction of a new, wider earthen channel and floodplain, habitat enhancement through planting of riparian vegetation, and access steps from the pathway to the creek bank for passive recreation. The changes to the park are not expected to substantially increase use of the park because Bike Route 20, the focal point of the park, is an existing pathway. Access via Bike Route 20 would be restored, and usage is expected to be similar to existing conditions. The use of Frederick Allen Park would change following construction to allow recreationists to have increased viewing and access to the creek. The environmental impact of the new access to the creek is discussed under Impact 3.12-2 below. The realigned Bike Route 20 multi-use path through Frederick Allen Park would abut the top of the channel and floodplain. A new split-rail fence would be installed at the top of the bank, and signage would be placed along the pathway to educate the public about the project and stream as well as habitat improvements and reduce encroachment into the new riparian habitat areas along the creek. The fencing and educational signage would reduce travel into areas that would cause physical deterioration of the park; therefore, the impact from physical deterioration would be less than significant.

Units 3 and 2 Floodwalls and Stormwater Pump Station

As described in the Project Description, the floodwall would be built on top of the existing concrete channel wall or set back from the existing wall. If the floodwall is set back from the existing wall, it would be sited on the east side of unnamed and unofficial paths #1 and #2 and would not affect access along the path. Access along both paths would be maintained during project operation, and the number of users of the paths would be similar to existing conditions. Substantial physical deterioration to unnamed paths #1 and #2 would not occur.

Unit 2 Lower College of Marin Concrete Channel Removal

Access along unnamed path #3 would be restored once the concrete channel removal construction is complete. A new informal path segment would be constructed on the right side of the creek to replace the segment of unnamed path #3 affected by the concrete-channel-removal construction. The new path segment would connect to the existing unnamed path #3 located south of the concrete-channel-removal work area, restoring access along unnamed path #3. Access would be maintained during project operations, and the number of path users would be similar to existing conditions. Substantial physical deterioration to unnamed path #3 would not occur.

Mitigation: None required.

	Significance Determination
Impact 3.12-2: The project would include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Overview

The fish-ladder removal and grading in Unit 4, new floodwall segments, and stormwater pump station in Unit 3 would not include recreational facilities or require the construction or expansion of recreational facilities that would have an adverse effect on the environment, and there would be no impact from construction or operation and maintenance of these facilities. The Frederick Allen Park and lower College of Marin concrete-removal project components include modifications to existing recreational facilities and recreational access. The impact of these recreational facilities is discussed below.

Construction

Construction of the project is not expected to induce substantial population growth that would in turn generate new recreational demand, requiring the construction or expansion of recreational facilities.

Unit 3 Frederick Allen Park

The project would include construction of new and relocated recreation elements within Frederick Allen Park, including new access to the creek and relocation and realignment of Bike Route 20. These changes to recreational elements within Frederick Allen Park could have adverse physical effects on the environment. These features are a part of the overall project, and impacts associated with implementing these features are analyzed throughout this document. The impacts that would result during construction of the realigned Bike Route 20 and the new creek access include tree removal and potential erosion from the grading and earth disturbance. Implementation of the planting plan included in Appendix B and compliance with the Construction General Permit through preparation of a project-specific Stormwater Pollution Prevention Plan would reduce impacts from the realigned pathway and new recreational elements in the park. Impacts from construction of recreational features at Frederick Allen Park would be less than significant.

Lower College of Marin Concrete Channel Removal

The project would include construction of an informal recreational path segment on the right side of the creek within a disturbed area on the College of Marin property to replace the segment of unnamed path #3 affected by the concrete-channel-removal construction. The new path segment would connect to the existing unnamed path #3 located south of the concrete-channel-removal work area. The new informal path segment would be located in a disturbed area, and the construction of the new path would not have significant impacts on the environment. The impact would be less than significant.

Operation and Maintenance
As discussed above, the project is not expected to induce substantial population growth that would in turn generate new recreational demand, requiring the construction or expansion of recreational facilities.

Unit 3 Frederick Allen Park
The project would involve improvements to Frederick Allen Park, including a new pedestrian pathway and adjacent tree planting for shade, relocation of the existing Bike Route 20 along the western edge of the park, and resting areas with seating and signage. These improvements are not expected to substantially change the use of the park from existing conditions, as recreationalists would continue to use the pathway and benches within the park similar to existing conditions.

Improvements also include installation of rocks, a split-rail fence to prevent encroachment into riparian habitats during the plant establishment period, and an opening in the split-rail fence that would allow for pedestrians to access the natural creek channel via an informal path. This improvement constitutes a new recreational feature as access to the bank of the creek does not currently exist. Allowing access to the creek bank could result in potential impacts to vegetation along the creek bed and to the water quality of the creek. The project would include installation of educational signage to support public education about streamflow processes and riparian corridors. Signs would also be installed to ask people to "keep out of restoration areas" during the plant establishment period. Due to the installation of fencing and educational signage, the impacts of the new informal path providing recreational access to Corte Madera Creek would be less than significant.

Unit 2 Lower College of Marin Concrete Channel Removal
The project would include construction of an informal recreational path segment on the right side of the creek within a disturbed area on the College of Marin property in Unit 2. Use of the new path is not expected to result in adverse physical effect on the environment because it would be replacing a segment of the existing unnamed path #3 that would be removed by the concrete channel removal project element. The new path would connect to an unaffected segment of unnamed path #3 located downstream of the concrete channel removal work area. The new path would be located outside of the restored channel and would have beneficial effects on the environment by reducing the risk that recreationists create their own footpaths within the newly restored habitats, which could cause erosion. The new informal footpath would not have an adverse physical effect on the environment, and impacts would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.12-3: The project could affect existing recreational opportunities.	**Construction: Less than Significant with Mitigation** **Operation and Maintenance: Less than Significant with Mitigation**

Construction

Construction of the project would involve the temporary closure of Frederick Allen Park, the segment of Bike Route 20 adjacent to Frederick Allen Park, and unnamed paths #1, #2, and #3 during construction of project components. Temporary closure of these recreational facilities during construction are discussed in Impact 3.12-1.

Frederick Allen Park

Access to the tennis courts at Frederick Allen Park would be maintained throughout the construction period. The recreational experience at the tennis courts would be affected by noise and dust during construction; however, the tennis courts would remain open for recreational use and the impact on the recreational opportunity would be less than significant.

Closure of Frederick Allen Park north of tennis courts and the segment of Bike Route 20 adjacent to Frederick Allen Park would be a temporary loss of recreational opportunity for up to seven months. The temporary impact on recreational opportunity due to closure of a segment of Bike Route 20 would be significant because Bike Route 20 is a significantly used recreational resource for the community. **Mitigation Measure 3.13-1: Traffic Management** requires use of flaggers to safely detour and redirect bicycle and pedestrian traffic around the construction area to safely connect access to Bike Route 20 around the work area. Mitigation Measure 3.13-1 also requires advance notification about the construction activities and impact on the Bike Route 20 multi-use pathway. Because the mitigation measure would provide safe detours for recreationists which would allow recreationists to continue to use Bike Route 20, and there are sufficient park spaces available for recreational use during the construction period, the impact on recreational opportunities during construction would be less than significant with mitigation.

Unnamed Paths

The project would require temporary closure of unnamed paths #1~~,~~ and #2~~, and #3~~ during construction of floodwalls and temporary closure of unnamed path #3 during removal of the concrete channel and habitat enhancement in Unit 2. The closures would last a few weeks. As described in Impact 3.12-1, access would be restored once construction is complete. Due to the limited and unofficial use of the unnamed paths and the ability to redirect recreational use to the official pathway at Bike Route 20, the impacts to recreational opportunity from temporary closure of unnamed paths #1, #2, and #3 during construction would be less than significant.

Operation and Maintenance

The analysis below focuses on the changes to the existing recreational facilities that would occur as a result of the project and the potential for those modifications to affect existing recreational opportunities.

Unit 4 Fish Ladder Removal and Grading

No recreational facilities are located within Unit 4; therefore, no recreational opportunities would be affected by project operation in Unit 4.

Unit 3 Frederick Allen Park

The project would involve changes to Frederick Allen Park, including removal of the existing concrete channel and construction of a new, wider earthen channel and floodplain, realignment of Bike Route 20, planting of riparian vegetation, and addition of rocks from Bike Route 20 down to the creek bank for passive recreation. The proposed rocks creating new access to the creek bank would create a new recreational opportunity by providing access to the creek, which does not currently exist. The new access to the creek and educational opportunities afforded through increased creek and habitat viewing would have a beneficial impact on the recreational experience in Frederick Allen Park.

Following construction, Bike Route 20 would be realigned along the edge of the park and at the top of the newly constructed creek channel. The multi-use pathway would drop gradually in elevation from the tennis courts to the widest area of the channel meander and rise gently back to the area adjacent to the connection with Unit 4. The realigned pathway would be designed to meet Americans with Disabilities Act requirements and the minor change in grade (less than 5 percent) along the pathway would not affect public access most of the year. The change in elevation of the pathway and removal of the concrete floodwall on the creek side of the pathway would result in increased flooding of the pathway as discussed in Section 3.9 Hydrology and Water Quality. The increased flooding would affect commuter and recreationist access to the pathway during flooding when the park is closed to protect public safety. The closure of the park due to flooding would not be routine and would only occur during major storm events when people are much less likely to be bicycle riding or recreating due to extreme weather conditions. Bicyclists and pedestrians would also have access to sidewalks and bike lanes on adjacent streets and other recreational areas outside the floodplain during the short periods when Frederick Allen Park is closed due to flooding. Because of the very infrequent and short duration of temporary park closures due to flooding and because recreationists are less likely to use outdoor recreational areas during extreme weather events, the impact from increased flooding in Frederick Allen Park would be less than significant.

The project construction would involve removal of trees within Frederick Allen Park, and the project includes planting of riparian vegetation within the park to account for this tree removal and for habitat enhancement. However, there would be a loss of vegetation cover and shade in the years immediately following construction and before the tree canopy is fully established. The tree canopy and associated shade on Bike Route 20 would be reduced for approximately 10 years following construction. The planting plan includes planting of larger trees to provide

some immediate shade for those seated at the benches and walking along the pathway, especially during the summer; however, there would still be a reduction in shade during the first 10 years following construction compared to existing conditions. The reduced shade would affect the recreational experience of the park until the tree canopy has re-established and the park would be shaded similar to existing conditions. The impact on the recreational experience would be most severe for elderly recreationists that use Frederick Allen Park due to protection from the sun and proximity to elderly care centers. The impact on the recreational opportunity from the reduction in shade during the first 10 years after revegetation would be significant. The District would implement **Mitigation Measure 3.1-3: Large Tree Planting** and **Mitigation Measure 3.12-3: Temporary Shade Structures** to reduce the effect from reduction in shade while trees establish post-construction. Mitigation Measure 3.1-3 includes planting with larger box trees to provide more shade following landscaping. Mitigation Measure 3.12-3 includes installation of temporary shade structures along the pathway to provide additional temporary shade during the plant establishment period. The shade structures would be designed and placed in coordination with the Town of Ross to locate shade at locations that best suit the community and select shade structures that fit within the landscape visual context of Frederick Allen Park. Due to planting of larger trees and installation of temporary shade structures, the impact on the recreational opportunity from temporary reduction in shade would be less than significant with mitigation.

Units 3 and 2 Floodwalls and Stormwater Pump Station

As described in Impact 3.12-1, unnamed paths #1 and #2 would be unaffected by operation of the floodwalls and stormwater pump station in Units 3 and 2; therefore, no recreational opportunities would be affected, and there would be no impact.

Unit 2 Lower College of Marin Concrete Channel Removal

As described in Impact 3.12-1, a new recreational path would be constructed to replace a segment of the existing unnamed path #3 that would be removed during the concrete-channel removal. Access along the realigned unnamed path #3 would be maintained, and the recreational opportunity would remain during project operation; therefore, the impact would be less than significant.

> **Mitigation:** Implement Mitigation Measure 3.1-3: Large Tree Planting; Mitigation Measure 3.12-3: Temporary Shade Structures; and Mitigation Measure 3.13-1: Traffic Management.
>
> **Mitigation Measure 3.12-3: Temporary Shade Structures.** The District shall coordinate with the Town of Ross to select the type and location for installation of temporary shade structures in Frederick Allen Park. The temporary shade structures shall be located along the edge of the Bike Route 20 multi-use path and at seating areas as needed to provide shade during the vegetation establishment period. The temporary shade structures shall be removed when the tree canopy has sufficiently established to provide afternoon shade of the pathway and as determined through coordination with the Town

of Ross. The District will submit a draft plan for the shade structures to the Town of Ross no less than 60 days prior to construction.

Significance after Mitigation: Traffic management mitigation would reduce the impact on recreational opportunities during construction to a less-than-significant level because recreational access on Bike Route 20 would be rerouted using detours. Mitigation measures for larger tree planting and shade structures would reduce the impact from temporary loss of shade to a less-than-significant level because the larger trees and shade structures would replace the recreational opportunity for individuals seeking shaded recreation.

3.12.7 References

ESA. (2018, August). San Anselmo Flood Risk Reduction Project Final EIR.

Kentfield/Greenbrae Community Planning Group and Marin County Planning Department. (1987, May). Kentfield/Greenbrae Community Plan.

Kentfield/Greenbrae Community Planning Group and Marin County Planning Department. (1987, May). Kentfield/Greenbrae Community Plan. Retrieved from https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/communityandareaplans/kentfield_greenbrae_community_plan_1987.pdf

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

Marin County. (2007, November 6). *Marin Countywide Plan*. Retrieved from https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/cwp_2015_update_r.pdf?la=en

Marin County Bicycle Coalition. (2008). Countywide Bicycle Route System. Fairfax, California.

Marin County Parks and Open Space Department. (2008, June). *Marin County Parks and Open Space Strategic Plan*. Retrieved from https://www.marincountyparks.org/-/media/files/sites/marin-county-parks/projects-and-plans/guiding-documents/guidingdocuments_strategicplan2008.pdf?la=en

Natural Resources Agency. (2018). Exhibit A Final Statements of Reasons for Regulatory Action Amendments to the State CEQA Guidelines OAL Notice File No. Z-2018-0116-12.

Town of Ross. (2007). *General Plan 2007-2025*.

Town of Ross. (2007). Town of Ross General Plan 2007-2025.

Town of Ross. (n.d.). Municipal Code. Retrieved from https://www.townofross.org/administration/page/municipal-code

3.13 Transportation and Circulation

3.13.1 Introduction

This section addresses environmental conditions relevant to roadways, transportation resources, and traffic circulation in areas that could be potentially affected by the project in and near the Town of Ross and in unincorporated Marin County and examines whether the project could have a significant impact on transportation and circulation. This section provides an overview of the existing conditions and the regulatory setting that apply to transportation and circulation within the project area. It then presents and discusses the potential project impacts and appropriate mitigation measures, as necessary.

3.13.2 Scoping Comments

Comments related to transportation, traffic, and circulation impacts were received during the public scoping process. These comments and the location where they are addressed in the transportation and circulation analysis are provided in Table 3.13-1.

Table 3.13-1 Transportation and Circulation Scoping Comments

Agency/Entity	Comment	Location in Transportation Section that Comment is Addressed
Garril Page	A realigned multi-use pathway encourages speeding bikes that endanger pedestrians, small children and pets enjoying walks along the path.	Section 3.13.6, Impact 3.13-2
Garril Page	Biking has become more and more popular form of recreation and for some people, of transportation. Unfortunately, the increase in popularity has meant increases in heedless behavior, traffic violations and increased speed that endangers pedestrians. Upgrading the multi-use path encourages greater use and abuse, requires more regulation, increased supervision, and added demands on Town staff and services as well as less privacy for town residents. The lengthy period of construction for the FAP Riparian corridor increases traffic disruption and inconvenience for Ross residents and drivers on SFD. The proposed FAP Riparian Corridor is maximum disruption for minimal gain.	Section 3.13.6, Impact 3.13-3

3.13.3 Environmental Setting

Overview

The project area is served by a roadway network of freeways (e.g., U.S. Highway 101 [Highway 101] and Interstate 580 [I-580]), arterial roadways (e.g., Sir Francis Drake Boulevard), and local streets.

Regional Access

Primary regional access to the project area is via Highway 101 and I-580. Highway 101 is highly congested, particularly during commute hours, because it is the primary link connecting the north Bay Area to the City of San Francisco. The highway also intersects with other important highways, such as I-580, which provides important inter-county and inter-regional links to the East Bay and Sacramento. Highway 101 is also vital in connecting communities within the county for everyday activities such as shopping, school, and recreation. Highway 101 has an annual average daily traffic volume of 147,000 (northbound) and 167,000 (southbound) vehicles at the interchange of Sir Francis Drake Boulevard southeast of the project area (Caltrans, 2016).

Northbound and southbound traffic on Highway 101 exits onto westbound Sir Francis Drake Boulevard, a major Marin County thoroughfare that extends from I-580 just west of the Richmond–San Rafael Bridge to the Point Reyes Lighthouse. Sir Francis Drake Boulevard is the primary east–west corridor in Marin County and is included as an arterial in the Marin County Congestion Management Program (CMP) from Toussin Avenue to College Avenue (lower Unit 3) and from College Avenue to Wolfe Grade (Unit 2) (TAM, 2019). Sir Francis Drake Boulevard is primarily a four-lane rural highway, which widens to six lanes approaching Larkspur Landing east of Highway 101 and narrows to two lanes as it extends west beyond Fairfax. Sir Francis Drake Boulevard in areas parallel to Unit 2 and extending up to College Avenue consists of two travel lanes in each direction, with a left turn lane at intersections. Sir Francis Drake Boulevard in areas parallel to Unit 3 and 4 north of College Avenue consists of one travel lane in each direction, with a center turn lane. The daily traffic volume on Sir Francis Drake Boulevard varies, ranging from 22,500 vehicles on the two-lane section between Town of Ross and Elm Avenue, to 31,500 vehicles on the four-lane section between Elm Avenue and McAllister Avenue (LSA, 2018).

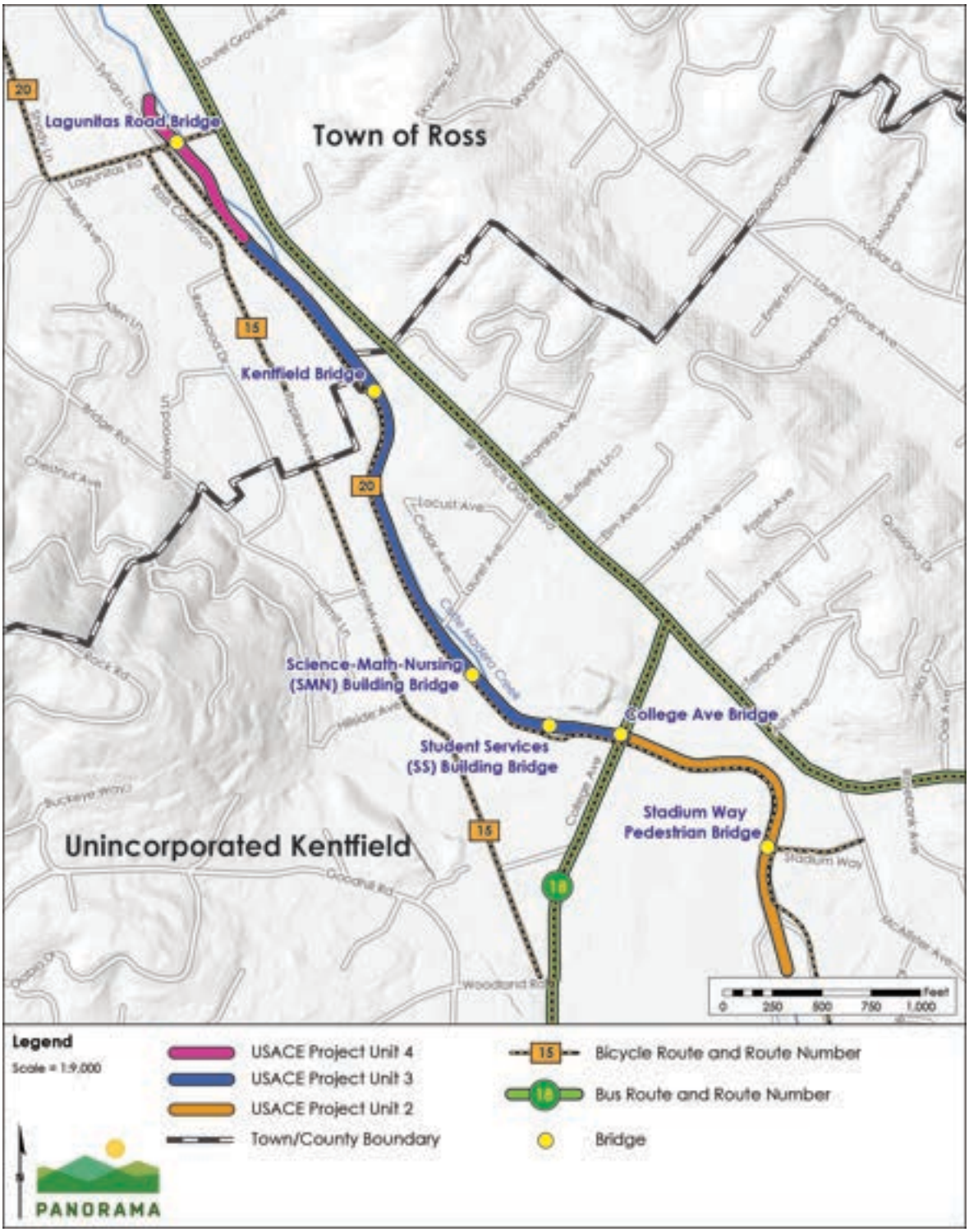
Local Transportation Network

The local transportation network in the project vicinity is shown on Figure 3.13-1. The local transportation network includes roads used for vehicle access, public transit, bikeways, and pedestrian access.

Vehicle Access

Sir Francis Drake Boulevard provides the main access to the project area from Highway 101 (Figure 2.6-5). Sir Francis Drake Boulevard is a main emergency or evacuation route for communities in West Marin (Marin County , 2019). Unit 4 and upper Unit 3 of Corte Madera Creek are accessible from Sir Francis Drake Boulevard, Lagunitas Road, and Ross Commons. Lagunitas Road extends from the Marin Art and Garden Center at Sir Francis Drake Boulevard through central Ross, past Ross School, residences, and the Lagunitas Country Club and terminates at Natalie Coffin Greene Park. Lagunitas Road crosses Corte Madera Creek at the Lagunitas Road Bridge in Unit 4. The Lagunitas Road Bridge was replaced in 2010.

Figure 3.13-1 Local Transportation Network



Sources: (Marin Transit , 2020; Golden Gate Bridge Highway and Transportation District, 2020)

The right bank of lower Unit 3 can be accessed from Poplar Avenue/Kent Avenue. Poplar Avenue/Kent Avenue is a local two-lane roadway that is parallel to Corte Madera Creek from College Avenue to Lagunitas Road. The left bank of Unit 3 can be accessed from Laurel Avenue and Cedar Avenue. Laurel Avenue and Cedar Avenue are two-lane local roads that provide local residential and College of Marin access from Sir Francis Drake Boulevard.

College Avenue crosses Corte Madera Creek at the College Avenue Bridge. College Avenue extends from Sir Francis Drake Boulevard and provides access to Kent Middle School and College of Marin properties on the right bank of Unit 2. The left bank of Unit 2 can be accessed from Stadium Way.

Transit Service

Golden Gate Transit and Marin County Transit District (Marin Transit) provide public transit service within the project area. Golden Gate Transit is a public transportation system serving the North Bay region and provides bus service along Sir Francis Drake Boulevard and College Avenue in the project area via Routes 18, 24, 24c, 24x, and 25 (Golden Gate Bridge Highway and Transportation District, 2020). Marin Transit provides local transit service within Marin County. Routes 22 and 228 are Marin County Transit routes along Sir Francis Drake Boulevard in the project area (Marin Transit , 2020). Bus stops in the project vicinity include bus stops along Sir Francis Drake Boulevard and College Avenue that also serve the College of Marin and Kent Middle School near the project area.

Bikeways/Pedestrian Circulation

Bikeways

Two countywide bike routes (Bike Route 15 and Bike Route 20) are located within and near the project area on the right bank of the Corte Madera Creek. Bike Route 15 is an on-street bikeway (shared roadway with motor vehicles) that runs along Ross Common, Poplar Avenue, and Kent Avenue from Lagunitas Road to Woodland Road.

Bike Route 20, a biking and pedestrian pathway, follows ~~the right bank of~~ Corte Madera Creek ~~and runs~~ from the Larkspur Ferry Terminal to the Town of Fairfax (Marin County Bicycle Coalition, 2008). ~~Bike Route 20 is a biking and pedestrian pathway.~~ Downstream from Stadium Way, the bike route follows the left bank of the creek. Moving upstream, the bike route crosses from the left bank to the right bank of the creek at the Stadium Way bridge. The bike route continues along the right bank as an off-street paved multi-use path, across College Avenue, to the beginning of Unit 4. The bike route then transitions to an on-road bike path adjacent to Unit 4. ~~The segment of Bike Route 20 within the project area consists of an off-street paved multi-use pathway adjacent to Corte Madera Creek Units 2 and 3. Bike Route 20 transitions to an on-road bike path adjacent to Unit 4. Bike Route 20 crosses over Corte Madera Creek from the right bank to the left bank at the Stadium Way pedestrian bridge and continues along the left bank as an off-street paved multi-use path to Bon Air Road.~~ Bike Route 20~~, within Units 3 and 2,~~ is heavily trafficked by pedestrians and bicyclists, including commuters.

Pedestrian Circulation
Sidewalks are located on Ross Common, Poplar Avenue, Kent Avenue, and College Avenue throughout the project area. Pedestrian access is also available on the Bike Route 20 multi-use pathway on the right bank of Units 3 and 2.

Two pedestrian bridges cross Corte Madera Creek in the College of Marin campus upstream of the College Avenue Bridge. These bridges include the pedestrian/maintenance access bridge connecting the West Campus parking area to the Student Services Building (SS Bridge) and the pedestrian bridge that connects the same parking area to the Science-Math-Nursing Building (SMN Bridge). The SS Bridge is located approximately 350 feet upstream from College Avenue, and the SMN Bridge is located approximately 500 feet upstream from the SS Bridge. A third pedestrian bridge crosses the creek at the end of Stadium Way in lower Unit 2.

Several unofficial pedestrian paths are located adjacent to Corte Madera Creek, opposite Bike Route 20. An unnamed pedestrian path is located between Kentfield Hospital and the terminus of Laurel Avenue (unnamed path #1) and between the southwest intersection of College Avenue and the creek and the Stadium Way Pedestrian Bridge (unnamed path #2). An additional unnamed trail begins on the left bank of the Stadium Way Pedestrian Bridge and continues south, where it loops south of the College of Marin football field and veers north to the parking area (unnamed path #3). While these are not official paths, they are utilized by pedestrians. Refer to Section 3.12 Recreation for more information on these unofficial pedestrian paths.

3.13.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

No federal laws or regulations for recreation are applicable to the project.

State Regulations

California Department of Transportation
California Department of Transportation (Caltrans) has jurisdiction over state highways and sets maximum load limits for trucks and safety requirements for oversized vehicles that operate on highways. Caltrans developed a "Guide for the Preparation of Traffic Impact Studies" (Caltrans, 2002) to provide guidance in determining if and when a traffic impact study is needed and requirements for producing a study. Caltrans prepares Transportation Concept Reports for each of its facilities. A Transportation Concept Report is a long-term planning document that each Caltrans district prepares for every state highway for long-range corridor planning processes.

Senate Bill 743
Senate Bill (SB) 743, passed in 2013, requires Office of Planning and Research (OPR) to develop new CEQA guidelines that address traffic metrics under CEQA. As stated in the legislation, upon adoption of the new guidelines, "automobile delay, as described solely by LOS or similar

measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to this division, except in locations specifically identified in the guidelines, if any." The December 28, 2018, update to CEQA Guidelines included Section 15064.3 to determine the significance of transportation impacts. Section 15064.3 does not include specific metrics for evaluating construction impacts but states, "For many projects, a qualitative analysis of construction traffic may be appropriate." It is the responsibility of the lead agency to determine the most appropriate metric to disclose transportation impacts.

Regional and Local Regulations

The project would only generate construction-related vehicle traffic. The goals and policies presented below are relevant to the analysis of construction-related traffic.

Marin Countywide Plan

The following traffic-related goals and policies presented in the Marin Countywide Plan are applicable to the project (Marin County Community Development Agency, 2~~015~~ 2007):

Goal TR-1: Safe and Efficient Movement of People and Goods. Provide a range of transportation options that meet the needs of residents, businesses, and travelers.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related to transportation are applicable to the project (Town of Ross, 2020).

Chapter 12.04 Excavations

> **12.04.010 Permit Required.** It is unlawful for any person to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare, or other public property within the town, for the purpose of laying, replacing or repairing any pipe, conduit or sewer therein, or for any other purpose whatsoever, without first obtaining a permit therefor and making a deposit with the superintendent of streets (Prior code §7100).
>
> **12.04.020 Notification to superintendent of streets.** Any person desiring to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare or other public property within the town, for the purpose of laying, replacing or repairing any pipe, conduit or sewer therein, or for any other purpose whatsoever, shall, before proceeding with the work, notify the superintendent of streets of the character and extent of the work proposed to be done and obtain from the superintendent of streets a permit to proceed with the work as the same shall be described in the permit (Prior code §7101).

Chapter 12.08 Encroachments in the Public Right-of-Way or Other Public Property

> **12.08.030 Permit Required.** No person shall create or maintain an encroachment, without obtaining and keeping in force and effect a permit as required by this chapter (Ord. 638 (part), 2013; Prior codes §3400, §3401, §3402, §3403).
>
> **12.08.040 Exceptions.** The following shall be exempt from the provisions of section 12.08.030 of this chapter:

b. Town officers, employees, or independent contractors serving the role of Town officials, or agents acting in the discharge of their official duties.

c. Any work being performed by any person pursuant to a contract with the Town.

Town of Ross General Plan

The following policies of the Ross General Plan related to transportation are applicable to the project (Town of Ross, 2007).

Goal 7. Safe, Connected and Well-Maintained Streets, Pedestrian and Bicycle Routes

7.5 Pavement Management. Maintain acceptable pavement management on all public streets and mitigate roadway impacts due to construction activities for aesthetic, structural and acoustical reasons. Hold developers responsible for pavement degradation caused by construction vehicles.

7.8 Bicycle and Pedestrian Travel. Encourage travel via bicycle and walking by providing and maintaining safe pedestrian and bicycle routes along main arteries in Ross. Consider links with Town destinations, surrounding area destinations and regional trails and bicycle systems. Participate in the Safe Routes to Schools Program.

Kentfield/Greenbrae Community Plan

The following goal of the Kentfield/Greenbrae Community Plan related to transportation is applicable to the project (Kentfield/Greenbrae Community Planning Group and Marin County Planning Department, 1987).

IV. Circulation Policy 1. The Kentfield/Greenbrae community desires a circulation system which allows safe movement and ready mobility for non-motorized traffic and for motor vehicles while preserving the community character.

3.13.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it would:

a. Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities;
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b);
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
d. Result in inadequate emergency access.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to transportation and circulation. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.13.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.13-1: The project could conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Vehicle Trips and Access Routes

Project construction would generate additional vehicle travel on area roadways from construction-worker vehicles and truck trips associated with delivery of equipment and materials and removal of excavated material and waste. Construction is assumed to begin in April 2022 with several overlapping phases. Construction of the project is anticipated to take approximately seven months (152 total workdays) at Frederick Allen Park and less time in other areas. Truck-trip estimates are provided in Table 2.6-5 in Chapter 2 Project Description. Several construction phases have overlapping construction time periods that could result in higher peak daily truck trips. Construction would generate a maximum of 509 one-way vehicle trips (417 trucks trips and 92 worker vehicle trips) per day during an up to two-week period. This would be expected to only occur for a short period during peak import and export of material for construction. The maximum average vehicle trips that would more typically occur during this two-week period would be far lower; 94 total one-way trips (42 truck trips and 52 worker trips). Project-related vehicle traffic would be even lower during the remainder of construction.

Vehicles would travel on Sir Francis Drake Boulevard to access all work areas. Vehicles traveling to Unit 4 and Frederick Allen Park would travel on Lagunitas Road and Ross Common. Vehicles traveling to Unit 3 floodwalls, fish-pool construction, and stormwater pump station would travel on Locust Avenue, Cedar Avenue, and Laurel Avenue. Vehicles traveling to the Unit 2 floodwall would travel on College Avenue and Stadium Way. Vehicles traveling the ~~l~~Lower College of Marin ~~concrete channel removal~~ area would travel on ~~Woodland Road~~ College Avenue and into the College of Marin campus at the entrance to parking lot 12. Limited vehicle access would also occur on segments of Bike Route 20 within Unit 3 and on an informal path within the District's easement on the left bank. During peak construction, vehicles would be dispersed through the local road network because access to each work area would be provided from different access roads, with the exception of Lagunitas Road and Ross

Commons, which provide access to Frederick Allen Park and Unit 4, and Laurel Avenue, which provides access to the stormwater pump station and a segment of new floodwall.

Road, Bicycle, and Pedestrian Route Closures
Lane closures would occur on College Avenue for up to two days during dewatering. The end of Laurel Avenue could be closed for up to one month during stormwater pump station construction. The segment of Bike Route 20 adjacent to Frederick Allen Park would be closed to pedestrian and bicycle access for up to seven months.

Operation and Maintenance
Following construction, Bike Route 20 would be re-opened, and the bike route would be located along the western limits of the park. The bike route would have the same capacity as existing conditions. The project would not require regular worker trips for operation. The frequency of inspection and maintenance of the Corte Madera Creek channel and floodwalls would be the same as under existing conditions. The stormwater pump station would require annual testing of the generator.

Plan, Program, and Policy Consistency Analysis
The project is located in the Town of Ross and Kentfield in unincorporated Marin County. Access to the project would be provided on Sir Francis Drake Boulevard, which is subject to the Marin Congestion Management Program. Bike and pedestrian routes occur in the project area and vicinity. Programs, plans, policies, and ordinances that are applicable to the circulations system in the project area include the following:

- Town of Ross General Plan
- Kentfield/Greenbrae Community Plan
- Marin Countywide Plan
- Marin Congestion Management Program
- Marin County Unincorporated Area Bicycle and Pedestrian Facility Master Plan (Alta Planning + Design, 2018)

Table 3.13-2 lists the programs, plans, and policies relevant to the circulation system in the project area and provides an evaluation of whether the project construction operation and maintenance would conflict each requirement.

Table 3.13-2 Applicable Transportation Programs, Plans, and Policies

Local Transportation Program or Plan	Policy	Analysis
Town of Ross General Plan	**7.5 Pavement Management.** Maintain acceptable pavement management on all public streets and mitigate roadway impacts due to construction activities for aesthetic, structural, and acoustical reasons. Hold developers responsible for	The project would not involve the use of heavy-duty tracked construction equipment that would damage pavement on local roadways surrounding the project area. The short-term project construction traffic would be dispersed on local roadways, and the short-term additional truck trips on local roads would not cause pavement

Local Transportation Program or Plan	Policy	Analysis
	pavement degradation caused by construction vehicles.	degradation. The project would not conflict with this policy.
	7.8 Bicycle and Pedestrian Travel. Encourage travel via bicycle and walking by providing and maintaining safe pedestrian and bicycle routes along main arteries in Ross. Consider links with Town destinations, surrounding area destinations, and regional trails and bicycle systems. Participate in the Safe Routes to Schools Program.	**Construction.** The project would result in closure of Bike Route 20 within Frederick Allen Park for up to seven months. The temporary closure of the bike route could result in temporarily unsafe travel conditions for bicyclists and pedestrians if bicyclists and pedestrians were not safely routed to bike and pedestrian safe routes during closure of Bike Route 20. The potential for unsafe conditions during construction is a potential conflict with the policy. Mitigation Measure 3.13-1 requires traffic management and rerouting bicycle and pedestrian traffic safely onto streets that support bicycle and pedestrian uses. The conflict with the policy would be less than significant with mitigation. **Operation.** The project would realign Bike Route 20 within Frederick Allen Park. The realigned multi-use pathway would maintain the safe pedestrian and bicycle route within Ross. The project would not conflict with this policy.
Kentfield/Greenbrae Community Plan	**IV. Circulation Policy 1.** The Kentfield/Greenbrae community desires a circulation system which allows safe movement and ready mobility for non-motorized traffic and for motor vehicles while preserving the community character.	The project would realign Bike Route 20 and allow for continued use of the multi-path trail for bicyclists and pedestrians post-construction. As described in Impact 3.14-3, the realigned pathway would be regraded with a one- to two-percent change in slope from existing grade. This minor change in grade from the existing condition would not change lines of sight or increase bicycle speeds to an extent where it would create a hazard to pedestrians. The project does not include any new design features or alterations for existing local roadways that would affect motor vehicle circulation. The project would not conflict with this policy.

Local Transportation Program or Plan	Policy	Analysis
Town of Ross Municipal Code	**12.04.010 Permit Required.** It is unlawful for any person to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare, or other public property within the town for the purpose of laying, replacing, or repairing any pipe, conduit, or sewer therein, or for any other purpose whatsoever, without first obtaining a permit therefor and making a deposit with the superintendent of streets (Prior code §7100).	The project would not open, excavate, or tear up any streets for the purpose of laying, replacing, or repairing any pipelines. There would be no conflict.
	12.08.030 Permit Required. No person shall create or maintain an encroachment, without obtaining and keeping in force and effect a permit as required by this chapter (Ord. 638 (part), 2013; Prior codes §3400, §3401, §3402, §3403).	The project would obtain a permit for construction within Town property at Frederick Allen Park, as needed. There would be no conflict with this policy.
Marin Congestion Management Program	If a general plan update or amendment, or major development proposal, is projected to generate a net increase of 100 vehicle trips during the PM (afternoon) peak hour, information is to be forwarded to TAM for comment and is subject to a CMP analysis. Local jurisdictions are responsible for determining which projects meet these criteria. The PM peak hour is most appropriate for this determination given that, for most roadway segments, traffic levels of service are worse during the PM peak hour than during the AM peak hours. Examples of projects that typically meet the 100-trip threshold include 100 single-family homes, 150 apartment units, 5,000 square feet of retail space, or 40,000 square feet of office space.	The project is not a development proposal that would generate new permanent peak-hour trips. Construction of the flood-control project would generate a maximum of 56 peak-hour worker trips traveling on Sir Francis Drake Boulevard during the peak of construction for up to two weeks. The project would generate 94 average daily trips during the construction period. Truck deliveries would be distributed throughout the nine-hour work day and would not generate trucks trips that would exceed the 100-trip threshold. The truck trips would also be temporary and limited to the short duration of construction. The proposed flood control project would not generate new peak-hour trips during operation. Because the project would not generate permanent traffic and the number of peak-hour trips would not exceed 100, there would be no conflict with the CMP.
Marin County Unincorporated Area Bicycle and Pedestrian Facility Master Plan	**Goal 2 Bicycle Transportation.** Make the bicycle an integral part of daily life in Marin County, particularly for trips of less than	The project will include realignment of Bike Route 20 in Frederick Allen Park. The realigned bikeway would maintain the bicycle network. The realigned bikeway

Local Transportation Program or Plan	Policy	Analysis
	five miles, by implementing and maintaining a bikeway network, providing end-of-trip facilities, improving bicycle/transit integration, encouraging bicycle use, and making bicycling safer and more convenient for people of all ages and abilities.	would maintain convenient and safe bicycle travel throughout the operational life of the project. The project would not conflict with this goal.
	Objective D Maintain and improve the quality, operation, and integrity of bikeway and walkway network facilities Objective D policy actions include: 1. Undertake routine maintenance of bikeway and walkway network facilities, such as sweeping bicycle lanes and sidewalks, as funding and priorities allow. 2. Ensure that repair and construction of transportation facilities minimizes disruption to the bicycling and walking environment to the extent practical. 3. Ensure that new bicycle and pedestrian improvements do not have a net negative impact on the environment. 4. Maximize opportunities to ensure that the pedestrian walkway network is accessible to, and usable by, persons with disabilities.	**Construction.** Construction of the project would temporarily disrupt bicycle and recreational access on Bike Route 20 within Frederick Allen Park for a period of seven months. The disruption to the bicycle and walking environment is a significant impact. Mitigation Measure 3.13-1 requires detours for bicyclists and pedestrians to continue to provide safe bicycle and pedestrian access from Ross Commons to the College of Marin while the multi-use pathway is closed. The impact would be less than significant with mitigation. **Operation and Maintenance.** The District will provide routine maintenance of the realigned pathway as part of the project. The realigned multi-use pathway would not have a negative impact on the environment, as analyzed in Section 3.12 Recreation. The realigned pathway would drop gradually in grade and would meet Americans with Disabilities Act requirements. The pathway would be accessible to and usable by persons with disabilities. The project would not conflict with the policy actions.

As discussed in Table 3.13-2, the project could conflict with policies for maintaining safe bicycle and pedestrian travel and minimizing disruption to the bicycling and walking environment during construction while Bike Route 20 is closed and reconstructed within Frederick Allen Park. These potential conflicts would be a significant impact. Because **Mitigation Measure 3.13-1: Traffic Management** requires safe detours for bicyclists and pedestrians to avoid conflicts with the policies and plans, the impact would be less than significant with mitigation.

Mitigation: Implement Mitigation Measure 3.13-1.

Mitigation: Mitigation Measure 3.13-1: Traffic Management

Prior to initiation of construction, the Project contractor(s) shall use a qualified traffic engineer to prepare a Traffic Management Plan (TMP). The TMP shall be developed on the basis of detailed design plans. The TMP shall be reviewed and approved by the District and agencies with jurisdiction over roadways affected by project construction activities prior to construction. Once approved, the TMP shall be incorporated into the contract documents specification. The TMP shall include, but not necessarily be limited to, the elements listed below:

- Develop a detour plan for bicycle and pedestrian traffic that shows the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin Parking lot to Ross Common.
- Post temporary Bike Route 20 detour and associated signage that meets all the accessibility requirements stated under the Americans with Disabilities Act and CBC Title 24.
- Post signs providing public notice of detours at least ~~14~~ 20 days prior to temporary bike route closure.
- Provide flaggers at the tennis courts within Frederick Allen Park to provide safe pedestrian access to the tennis courts.
- Control and monitor construction-vehicle movements by enforcing standard construction specifications through periodic on-site inspections.
- Install traffic-control devices where traffic conditions warrant, as specified in the applicable jurisdiction's standards (e.g., the California Manual on Uniform Traffic Control Devices; Part 6: Temporary Traffic Control); flaggers would be used, when warranted, to control vehicle movements.
- Implement a public information program to notify interested parties of the impending construction activities using means such as print media, radio, and/or web-based messages and information.
- Comply with roadside safety protocols to reduce the risk of accidents.
- Maintain access for emergency vehicles at all times. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways.
- Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner as to minimize obstruction to traffic.

Significance after Mitigation: Because Mitigation Measure 3.13-1 would safely reroute pedestrian and bicycle traffic onto adjacent safe routes with bicycle and pedestrian facilities, the project would avoid conflicts with policies and the impact would be less than significant with mitigation.

	Significance Determination
Impact 3.13-2: The project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

During construction, materials would be delivered to the project area using haul trucks. Construction would generate an average of 46 one-way trips per day over the construction period, with a maximum average of up to 94 one-way trips. The project would result in a temporary increase in the amount of truck trips. Guidance from OPR suggests that "new development projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact." (Office of Planning and Research, 2018) The average number of trips that would be generated during construction is both temporary and less than 110 trips per day. Because the number of temporary vehicle trips generated during construction is below the numeric threshold at which a vehicle miles traveled (VMT) is considered potentially significant, the VMT impact during construction would be less than significant.

Operation and Maintenance

Once constructed, the project would require vehicle travel for maintenance activities including vegetation management, sediment and debris removal, stormwater pump station annual testing, and annual inspections. The District currently conducts routine maintenance and inspections of the flood control channel. The frequency of inspection and maintenance activities for the project would be similar to the District's inspection and maintenance for the existing flood control channel. The project would induce minimal VMT during the operation and maintenance phase, and therefore impacts would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.13-3: The project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Frederick Allen Park

The Bike Route 20 segment within Frederick Allen Park would be temporarily closed during project construction, for a period of approximately seven months. Closure of a segment of Bike Route 20 could create hazardous conditions for bicyclists, pedestrians, and vehicles if bicyclists and pedestrians were routed to Sir Francis Drake Boulevard, which does not have safe bicycle and pedestrian facilities. The use of the multi-use path by construction equipment could also create hazardous conditions for bicyclists if the construction vehicles were not properly isolated

from the bicycle traffic. The impact from increased hazards would be significant. **Mitigation Measure 3.13-1: Traffic Management** specifies requirements for detours of bicycle and pedestrian traffic to safely route bicyclists and pedestrians to Poplar and Kent Avenues and use flaggers to avoid conflicts between construction vehicles and bicyclists. Because Mitigation Measure 3.13-1 provides approaches to safely detours bicyclists and pedestrians during construction, the impact on bicycle safety from temporary closure of Bike Route 20 would be less than significant with mitigation.

Stormwater Pump Station and Unit 3 Dewatering

Project construction would require the temporary closure of one lane on College Avenue for up to two days during dewatering. A segment at the end of Laurel Avenue would also be closed for up to one month during construction of the stormwater pump station. The construction area for the stormwater pump station would be configured to allow access to the College of Marin around the construction area and not block travel to any residential streets. The lane closures could cause increased traffic hazards, which would be a significant impact. **Mitigation Measure 3.13-1: Traffic Management** requires use of flaggers and illuminated signs to safely detour and redirect traffic around the work areas. Because the mitigation defines procedures for traffic safety during lane closures, the impact of lane closure on traffic hazards would be less than significant with mitigation.

Operation and Maintenance

After construction, the project would realign Bike Route 20 through Frederick Allen Park along the western edge of the park. The realigned pathway would be regraded with a one- to two-percent change in slope from existing grade. This minor change in grade and alignment from the existing condition would not noticeably change lines of sight or increase bicycle speeds. The alignment and change in grade would be very gradual as shown in the visual simulations provided in 3.1 Aesthetics. The realigned multi-use path would not create a hazard for bicyclists or pedestrians. Impacts would be less than significant.

> **Mitigation:** Implement Mitigation Measure 3.13-1: Traffic Management.
>
> **Significance after Mitigation:** Because the traffic management plan includes requirements for safe detours and use of flaggers to maintain pedestrians', bicyclists', and vehicle safety during bike-lane and traffic-lane closures, the impact would be less than significant with mitigation.

	Significance Determination
Impact 3.13-4: The project would not result in inadequate emergency access.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

Construction-related truck traffic has the potential to occur during weekday peak hours, and therefore it could temporarily impede traffic flow, including for emergency service providers. The construction of the project site may require construction-vehicle use along nearby

roadways, including Sir Francis Drake Boulevard, which is a main emergency or evacuation route for communities in West Marin (refer to Section 3.8 Hazards and Hazardous Materials for additional information). The project would not cause any lane or road closure on Sir Francis Drake Boulevard and would therefore not affect emergency evacuation, if needed.

Construction activities could result in temporary closure of one lane on College Avenue at the overcrossing of the Corte Madera Creek during installation of dewatering infrastructure. Temporary lane closure on College Avenue would occur for up to two days during installation and removal of the cofferdam (one day each). College Avenue is a four-lane road at the overcrossing of Corte Madera Creek. Vehicle access would remain open in both directions during single lane closure. The project would therefore not result in inadequate emergency access. The impact would be less than significant.

The end of Laurel Avenue, south of Cedar Avenue, may be closed for up to one month during construction of the stormwater pump station. Emergency vehicles would be able to travel around the work area at the end of Laurel Avenue to access the College of Marin or allow for emergency evacuation from the College of Marin. The project would not result in inadequate emergency access because emergency vehicles would maintain ingress and egress access around the work area through construction. The impact on emergency access would therefore be less than significant.

Operation and Maintenance
The project would not include any alterations of existing roadway features that would cause a permanent change in access for emergency vehicles. Therefore, there would be no impact.

Mitigation: None required.

3.13.7 References

Alta Planning + Design. (2018). *Marin County Unincorporated Area Bicycle and Pedestrian Facility Master Plan.* Marin County.

Caltrans. (2002, December). Guide for the Preparation of Traffic Impact Studies .

Caltrans. (2016). 2016 Traffic Volumes on California State Highways .

Golden Gate Bridge Highway and Transportation District. (2020). Find Your Route & Stop. Retrieved July 7, 2020, from https://www.goldengate.org/bus/riding-the-bus/find-your-route-stop/

Kentfield/Greenbrae Community Planning Group and Marin County Planning Department. (1987, May). Kentfield/Greenbrae Community Plan.

Lagunitas Road Bridge Replacement Project Draft Environmental Impact Reort. (Town of Ross 2009, in USACE 2010). *Corte Mandera Creek Flood Control Study Baseline Report*.

LSA. (2018, March). Sir Francis Drake Boulevard Rehabilitation Project Final EIR Volume.

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Marin County . (2019, April 18). Wildfire Preparedness A New Approach .

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

Marin County Bicycle Coalition. (2008). Countywide Bicycle Route System. Fairfax, California.

Marin County Community Development Agency. (~~2015~~ 2007). *Marin Countwide Plan: Transportation Element.*

Marin Transit . (2020, September). Local Service (Marin Transit System Map).

Office of Planning and Research. (2018). *Technical Advisory in Evaluating Transportation Impacts in CEQA.*

OPR. (2020). SB 743 Frequently Asked Questions. Retrieved September 22, 2020, from https://opr.ca.gov/ceqa/updates/sb-743/faq.html

TAM. (2019). 2019 CMP Update.

Town of Ross. (2007, June). Town of Ross General Plan.

Town of Ross, 2009. (in USACE 2010). Corte Madera Creek Flood Control Study Baseline Report.

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3.14 Tribal Cultural Resources

3.14.1 Introduction

This section addresses the tribal cultural resources located within the project area. This section provides an overview of the environmental and regulatory settings that apply to the project. Also discussed in this section are the significance criteria used for determining environmental impacts, potential impacts associated with the project, and, where applicable, mitigation measures that would reduce those impacts to a less-than-significant level.

3.14.2 Scoping Comments

Comments related to tribal cultural resources impacts were received during the public scoping process. These comments and the location where they are addressed in the tribal cultural resources analysis are provided in Table 3.14-1.

Table 3.14-1 Tribal Cultural Resources Scoping Comments

Agency/Entity	Comment	Location in Tribal Cultural Resources Section that Comment is Addressed
Garril Page	I combine these two headings [Cultural Resources/Tribal Cultural Resources] as I have commented extensively on these subjects in prior EIR, and EIR/EIS opportunities. Having been told the USACE and County have collected such materials for inclusion in the current EIR, I herewith incorporate those Comments by reference. If, in fact, the current consultants have found and read my prior Comments, they have been advised regarding historical, cultural and tribal resources in Ross from 1960-2018. I assume the Town of Ross has mentioned relevant reports and resources for which Ross has contracted separately.	Section 3.14.3 (see also Section 3.4 Cultural Resources, 3.4.3 Environmental Setting, Project Setting, Record Search)
Garril Page	I will add that the FAP Riparian Corridor proposes excavation and land disturbance in areas of early tribal settlements. The Project lead agency must exercise extreme diligence in honoring artifacts uncovered in the project area.	3.14.4 Regulatory Setting, Regional and Local Regulations

3.14.3 Environmental Setting

Project Setting

The project area is located in the ancestral territory of the Habasto tribelet of the Coast Miwok. Ethnographic information on the Coast Miwok is provided in Subsection 3.4.3 Ethnographic Context of Section 3.4 Cultural Resources.

Native American Consultation

A request was made to the Native American Heritage Commission (NAHC) on June 15, 2020, to review its files for the presence of sacred sites at or near the project location. The NAHC replied on June 16, 2020, stating that a search of their files did not identify the presence of significant tribal resources in or near the project area.

The District sent project-notification letters to two tribes (see Table 3.14-2) for the purpose of consultation as required by Public Resources Code (PRC) Section 21080.3.1. The letters were sent via U.S. Certified Mail with a return receipt on June 23, 2020. Follow-up emails were sent on August 5, 2020. The Federated Indians of Graton Rancheria (FIGR) responded in an emailed letter dated August 6, 2020, in which they formally requested consultation on the project. Per their request, confidential record-search information was forwarded to the tribe on August 21, 2020. The Ione Band of Miwok Indians did not respond to the notification letter or follow-up email. All correspondence related to PRC Section 21080.3.1 is presented in Appendix E.

Table 3.14-2 Native American AB 52 Consultation

Contact	Tribe	Letter Date	Email Follow-up Date	Next Steps
Buffy McQuillen Tribal Heritage Preservation Officer	Federated Indians of Graton Rancheria	June 23, 2020	August 5, 2020	August 6, 2020: FIGR responded in an emailed letter. August 21, 2020: Confidential record search information was forwarded to the tribe. October 21, 2020; District sent a follow-up email to the Tribe to ask if they wished to consult further on the project. December 3, 2020; District sent follow-up email to the Tribe to request review of Mitigation Measure 3.4-2. December 8, 2020: FIGR accepted Mitigation Measure 3.4-2.
Sara D. Setshwaelo, Chairperson	Ione Band of Miwok Indians	June 23, 2020	August 5, 2020	No response received as of the date of this Draft EIR.

The District entered into formal consultation with the FIGR on August 21, 2020. However, the District has not yet received any information from the tribe regarding tribal cultural resources. The District wrote to the FIGR in an email on December 3, 2020, providing them with the mitigation measure for review and requesting conclusion of consultation if the tribe has no comments. FIGR responded in email on December 8, 2020, accepting the mitigation measure and concluding consultation on the project.

3.14.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

National Historic Preservation Act

Federal law does not address tribal cultural resources; however, a tribal cultural resource may qualify as a traditional cultural property (TCP) and be considered a historic property as eligible for listing in the National Register of Historic Places (NRHP) (see Section 3.4 Cultural Resources for full discussion). TCPs are locations of cultural value that are historic properties. A place of cultural value is eligible as a TCP "because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker & King, 1990). A TCP must be a tangible property, meaning that it must be a place with a referenced location, and it must have continually been a part of the community's cultural practices and beliefs for the past 50 years or more. Unlike tribal cultural resources, TCPs can be associated with communities other than Native American tribes although the resources are usually associated with tribes. By definition, TCPs are historic properties; that is, they meet the eligibility criteria as a historic property for listing in the NRHP. Therefore, as historic properties, TCPs must be treated according to the implementing regulations found under Title 36 CFR § 800, as amended in 2001.

State Regulations

California Register of Historical Resources

PRC Section 5024.1 is a listing of those properties that are to be protected from substantial adverse change, and it includes properties that are listed, or have been formally determined to be eligible for listing, in the NRHP, State Historical Landmarks, and eligible Points of Historical Interest (see Section 3.4 Cultural Resources for a full description).

Assembly Bill 52

The California State Legislature passed Assembly Bill (AB) 52, which added language to the PRC regarding the evaluation of impacts on tribal cultural resources under CEQA, and which requires consultation with California Native American tribes with a traditional and cultural affiliation with a project area. AB 52 requires lead agencies to analyze project impacts on tribal cultural resources separately from archaeological resources (PRC Sections 21074, 21083.09). AB 52 defines tribal cultural resources in a new section of the PRC (Section 21074). AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC Sections 21080.3.1, 21080.3.2, 21082.3).

Specifically, PRC Section 21084.3 states the following:

1. Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.
2. If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in

the consultation process provided in Section 21080.3.2, the following are examples of mitigation measures that, if feasible, may be considered to avoid or minimize the significant adverse impacts:

a. Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
    i. Protecting the cultural character and integrity of the resource.
    ii. Protecting the traditional use of the resource.
    iii. Protecting the confidentiality of the resource.
c. Permanent conservation easements or other interests in real property, with culturally
d. Appropriate management criteria for the purposes of preserving or utilizing the resources or places.
e. Protecting the resource.

In addition, the Office of Planning and Research updated Appendix G of the CEQA Guidelines to provide sample questions regarding impacts on tribal cultural resources (PRC Section 21083.09).

Public Ressources Code

PRC Section 21074

Tribal cultural resources have the following meaning under PRC Section 21074(a):

1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    a. Included or determined to be eligible for inclusion in the CRHR.
    b. Included in a local register of historical resources as defined in PRC Section 5020.1(k).
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). In applying the criteria set forth in PRC Section 5024.1(c), the lead agency shall consider the significance of the resource to a California Native American tribe.
3. A cultural landscape that meets the criteria of PRC Section 21074(a) if the landscape is geographically defined in terms of the size and scope.
4. A historical resource as described in PRC Section 21084.1, a unique archaeological resource as defined in PRC Section 21083.2, or a non-unique archaeological

resource as defined in PRC Section 21083.2 may also be a tribal cultural resource if it meets the criteria of PRC Section 21074(a).

PRC Section 5020.1

According to CEQA Guidelines Section 15064.5, the term "historical resources" includes resources that are listed in a local register. As defined in PRC Section 5020.1(k), "local register of historical resources" means a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution.

PRC Section 5024.1

A Lead Agency, in its discretion and supported by substantial evidence, may determine a resource to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. As defined in PRC Section 5024.1, a resource may be listed as an historical resource in the California Register if it meets any of the following NRHP criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

PRC Sections 5097.98-5097.991

PRC Sections 5097.98-5097.991 discuss the procedures to follow up on the discovery of Native American human remains. They also establish that it is a felony to obtain or possess Native American artifacts or human remains taken from a grave or cairn (see Section 3.4 Cultural Resources for a full description).

California Native American Graves Protection and Repatriation Act

The California Native American Graves Protection and Repatriation Act of 2001 is the State repatriation policy for Native American remains (see Section 3.4 Cultural Resources, for a full description).

Regional and Local Regulations

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project:

> **HAR-1.1: Preserve Historical and Archaeological Resources**. Identify archaeological and historical resource sites.
>
> **HAR-1.2: Document Historical Information**. Provide documents, photographs, and other historical information whenever possible to be catalogued in the Anne T. Kent California Room in the Marin County Free Library.

HAR-1.3: Avoid Impacts to Historical and Archaeological Resources. Ensure that human activity avoids damaging cultural resources, where feasible.

Marin County Development Code

Marin County has the following code section to ensure that the construction of new development and the establishment of new and modified uses contribute to the maintenance of a stable and healthy environment, that new development is harmonious in character with existing and future development, and that the use and enjoyment of neighboring properties are protected, as established in the Countywide Plan.

22.20.040: Archaeological and Historic Resources. In the event that archaeological or historic resources are discovered during any construction, construction activities shall cease, and the Agency shall be notified so that the extent and location of discovered materials may be recorded by a qualified archaeologist, and disposition of artifacts may occur in compliance with State and Federal law. The disturbance of an Indian midden may require the issuance of an Excavation Permit by the Department of Public Works, in compliance with Chapter 5.32 (Excavating Indian Middens) of the County Code.

Town of Ross General Plan

The following policies of the Town of Ross General Plan related to tribal cultural resources are applicable to the project (Town of Ross, 2007).

Goal 4. Protecting Historic Places and Resources

4.5 Archaeological Resources. Implement measures to preserve and protect archaeological resources. Whenever possible, identify archaeological resources and potential impacts on such resources. Provide information and direction to property owners in order to make them aware of these resources. Require archaeological surveys, conducted by an archaeologist who appears on the Northwest Information Center's list of archaeologists qualified to do historic preservation fieldwork in Marin County, in areas of documented archaeological sensitivity. Develop design review standards for projects that may potentially impact cultural resources.

3.14.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it would:

a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to changes in tribal cultural resources impacts in the project area. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section.

3.14.6 Impact Discussion

Impact Analyzed

Impact 3.14-1: The project could cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i. **Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or** ii. **A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.**	**Significance Determination**
	Construction: Less than Significant with Mitigation
	Operation and Maintenance: No Impact

Construction

As discussed in Section 3.4 Cultural Resources, there are no known historical resources that are listed or eligible for listing in the CRHR in the project area. The project would not impact any known tribal cultural resource that is listed or eligible for listing in the CRHR. However, construction of the project could discover archaeological deposits that local tribes deem to be tribal cultural resources, as defined under PRC Section 21074(a); this is particularly applicable to

the discovery of human remains. The discovery of tribal cultural resources could result in significant impacts on the resources if they were not properly managed.

Archaeological resources discovered during construction would be subject to **Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources**, which requires stopping work within 50 feet of uncovered archaeological resources, and requiring examination of the finds by a qualified archaeologist. The discovery of a Native American resource, which could be determined to be a tribal cultural resource, would require the involvement of a Native American representative. The mitigation measure, furthermore, requires that tribal cultural resources be treated according to PRC 21084.3, by considering all preservation options that include avoidance and preservation in place or otherwise treating the resource with culturally appropriate dignity.

By following the procedures in Mitigation Measure 3.4-2, the District would avoid substantial adverse changes in the significance of an archaeological resource that are also tribal cultural resources; therefore, the impact on tribal cultural resources would be less than significant with mitigation.

Operation and Maintenance

Operation and maintenance of the project will not involve ground-disturbing activities. The proposed project elements include a more natural channel in Frederick Allen Park and within the lower College of Marin reach in Unit 2. Operation and maintenance of the project would have no impact on tribal cultural resources.

> **Mitigation:** Implement Mitigation Measure 3.4-2.
>
> **Significance after Mitigation:** Mitigation Measure 3.4-2 specifies procedures to avoid adverse effects to archaeological resources by stopping work when archaeological materials are discovered, evaluating the significance of the find, and developing appropriate treatment to protect the site or mitigate impacts. Should the archaeological resource also be determined to be a tribal cultural resource, the mitigation measure requires application of treatments under PRC 21084.3. Avoidance and preservation in place would be the preferred option, followed by other measures preserves or restores the cultural character and integrity of a tribal cultural resource. As a result, the impact on archaeological resources would be less than significant with mitigation.

3.14.7 References

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

Parker, P. L., & King, T. F. (1990). Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Publication 38. National Park Service, Washington, DC. Revised 1998.

Town of Ross. (2007, June). Town of Ross General Plan.

3.15 Utilities and Service Systems

3.15.1 Introduction

This section describes existing utilities and service systems in the vicinity of the project, including water supply, wastewater management services, solid waste management services, electricity, and natural gas. The analysis is based on review of available maps of the project area and vicinity. This section also includes relevant regulations, a discussion of potential project impacts, and appropriate mitigation measures, where necessary. No scoping comments relevant to evaluation of utilities and service systems were provided during the public scoping period.

3.15.2 Environmental Setting

Water Supply

The Marin Municipal Water District (MMWD) is a public agency that serves approximately 191,300 customers in south and central Marin County. The MMWD provides water to the project area for domestic, commercial, and firefighting use. The MMWD facilities include seven reservoirs, ~~four~~ three water-treatment plants, and various storage tanks, pumps, and distribution mains (MMWD, 2020). The water supply comes from a network of seven local rain-fed reservoirs. The MMWD estimated that the operational yield of their reservoirs is about 20,000-acre feet per year (MMWD, 2016), which is equivalent to 6.5 billion gallons per year.[1] Non-potable water is available from local groundwater wells located in the Town of Ross (Marin County, 2005). There are three groundwater basins that are at least partially within the MMWD's service area. These three basins include Ross Valley, San Rafael Valley, and part of the Novato Basin.

Several stormwater lines and MMWD water ~~and stormwater~~ lines are located within the project area. There are water supply and stormwater lines that cross the creek just upstream of Lagunitas Road Bridge in Unit 4. Water pipelines are also adjacent to the southern end of Unit 4 and parallel parts of Bike Route 20. Two stormwater lines are located near the proposed storm drain pump station in Unit 3. Smaller stormwater lines are scattered throughout Unit 3 and Unit 2. One water pipeline crosses the creek aboveground at Stadium Way in Unit 2. See Figure 3.15-1 to Figure 3.15-3 for locations of water pipelines in the project area.

Wastewater Management Services

The Ross Valley Sanitary District (RVSD) is the oldest sanitary district in California. The RVSD operates and maintains approximately 200 miles of collection sewer lines and 19 pumping stations, which collect, pump, and transport approximately four million gallons of wastewater

[1] One acre-foot is equivalent to 325,851 gallons of water.

per day to the Central Marin Sanitation Agency for treatment. The RVSD boundaries include 26.75 square miles of the Ross Valley watershed, including the project area. The RVSD also serves wastewater collection systems in Murray Park (RSVD, 2020).

RVSD sanitary sewer lines run beneath Corte Madera Creek in a northwest/southeast direction within the project area from the southern end of Unit 4 near the fish ladder to near the end of Unit 2. The sewer lines cross beneath Corte Madera Creek at the approximate location of the fish ladder and at Stadium Way in Unit 2 (refer to Figure 3.15-1 to Figure 3.15-3). The sewer line that crosses Corte Madera Creek at the end of Stadium Way passes beneath the concrete channel in a siphon structure adjacent to the pedestrian bridge. ~~An aboveground sewer pipe crosses the creek on the pedestrian bridge at the end of Stadium Way (Figure 3.15-3).~~

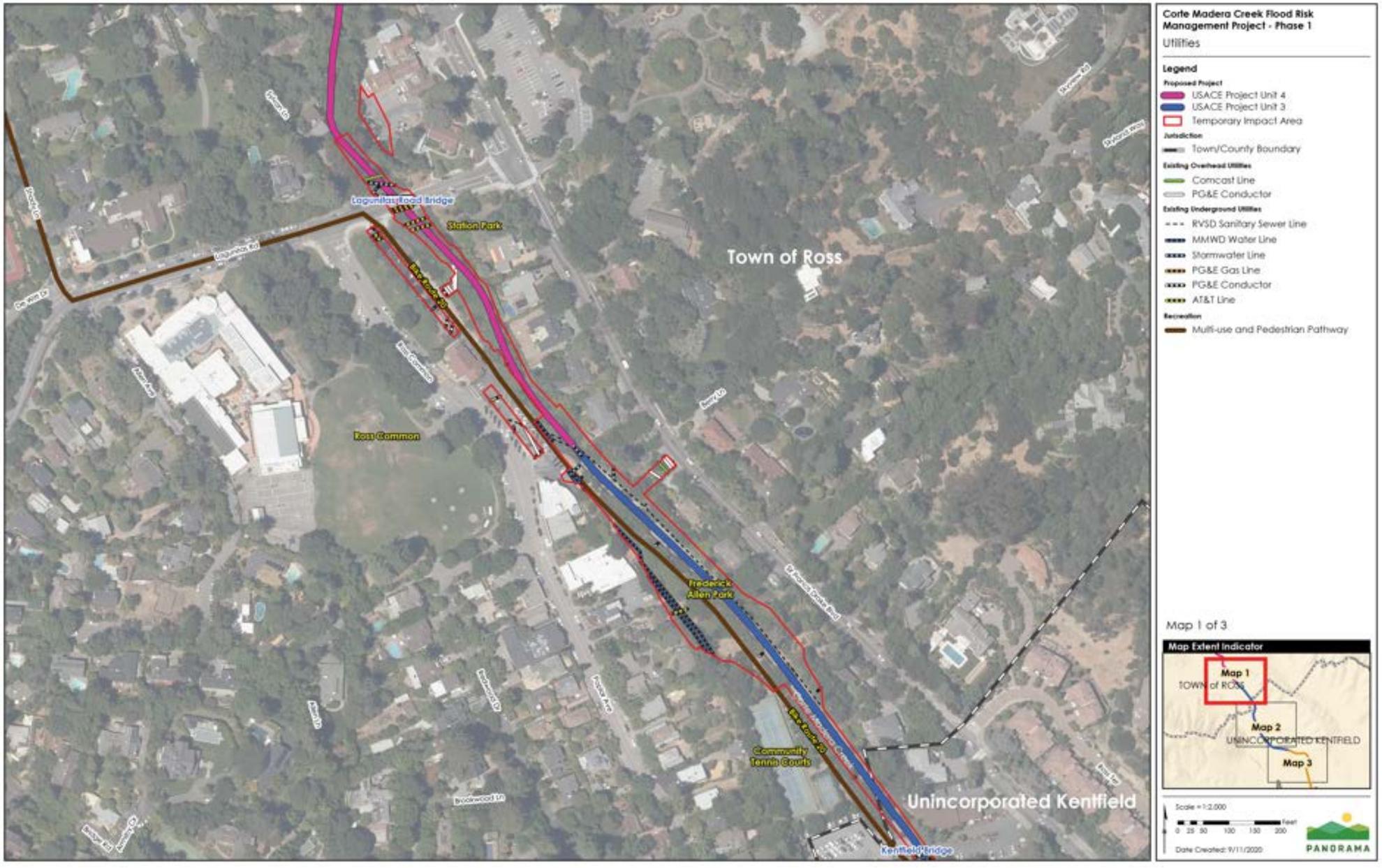
Solid Waste Management Services

The Marin Sanitary Service is responsible for solid waste disposal in central Marin County. It serves more than 32,000 residential and commercial accounts in San Rafael, San Anselmo, Fairfax, Ross, Corte Madera, Larkspur, and other unincorporated areas of Marin County (Marin Sanitary Service, 2020). The Marin Sanitary Service operates the Resource Recovery and Recycling Plant and a transfer station where waste from commercial collectors is collected then transported by truck to Redwood Landfill (USACE, 2010). The Redwood Landfill, operated by Waste Management, located in northern Marin County (projected to close in 2039), is the primary landfill for residential and commercial wastes generated in the vicinity of and within the project area. The current permitted capacity of the landfill is 19.1 million cubic yards, with a permitted daily disposal rate of 2,310 tons (Waste Management, 2020).

Electricity and Natural Gas

Pacific Gas and Electric (PG&E) provides electricity and natural gas services for all of Marin County. PG&E obtains its energy supplies from power plants and natural gas fields in northern California and from energy purchased outside its service area, which is delivered through high-voltage transmission lines and pipelines. Much of the County's electricity comes from geothermal plants in the nearby Geysers region. There are no power plants located in Marin County. Marin Clean Energy procures renewable sources of electricity and partners with PG&E to deliver electricity.

Figure 3.15-1 Utilities and Service Systems in the Project Area (Map 1 of 3)



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Golden Gate National Parks Conservancy 2018, Marin County Flood Control and Water Conservation District 2015, PG&E 2020)

Figure 3.15-2 Utilities and Service Systems in the Project Area (Map 2 of 3)

Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Golden Gate National Parks Conservancy 2018, Marin County Flood Control and Water Conservation District 2015, PG&E 2020)

Figure 3.15-3 Utilities and Service Systems in the Project Area (Map 3 of 3)

Sources *(Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Golden Gate National Parks Conservancy 2018, Marin County Flood Control and Water Conservation District 2015, PG&E 2020)*

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The PG&E utility system in the project area consists of underground gas lines and conductors crossing the creek at Lagunitas Road Bridge; overhead and underground conductors adjacent to the Unit 4 grading area; overhead conductors within proposed staging areas along Unit 4 and Unit 3, underground conductors at Kentfield Bridge, and an overhead conductor near Locust Avenue; underground gas lines adjacent to the proposed stormwater pump station at the end of Laurel Avenue; and an underground conductor at the lower end of Unit 2. See Figure 3.15-1 to Figure 3.15-3 for locations of PG&E utility infrastructure in the project area.

Communication System

Existing communication services (including cable, telephone, and internet services) in the project area are provided by Comcast and AT&T. Overhead Comcast lines cross the creek upstream of Lagunitas Road Bridge, within the proposed staging area south of Berry Lane, and within the proposed staging area at Locust Avenue. AT&T lines run underground and cross the creek at Lagunitas Road Bridge in Unit 4, Frederick Allen Park in Unit 3, College Avenue Bridge at the lower end of Unit 3, and along Unit 2. See Figure 3.15-1 to Figure 3.15-3 for locations of the communication system in the project area.

College of Marin Infrastructure

The College of Marin (COM) has its own underground utility network serving the College of Marin Kentfield Campus, located directly adjacent to the left and right bank of Unit 2 and adjacent to the left bank of Unit 3 along Corte Madera Creek. The existing COM utility lines cross the creek at one location just north of the SMN Building Bridge. They also parallel both sides of the creek within proposed staging areas near the SMN Building Bridge and the proposed stormwater pump station. Several lines are also located along the left bank of the creek flanking both sides of College Avenue Bridge.

3.15.3 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

Although there are multiple federal laws, statutes, and regulations that would generally apply to the project, the federal government and its agencies have delegated the authority to implement and satisfy those requirements relevant to utilities and service systems to the state of California and its agencies, as discussed below.

State Regulations

California's Integrated Waste Management Act of 1989

The California Integrated Waste Management Act of 1989 (Public Resources Code, Division 30), enacted through Assembly Bill 939 and modified by subsequent legislation, requires all California cities and counties to implement programs to reduce, recycle, and compost at least 50 percent of wastes by the year 2000 and establishes the goal of diverting at least 75 percent of

generated waste (based on per capita disposal rates) by 2020.[2] A jurisdiction's diversion rate is the percentage of the total waste that a jurisdiction diverts from disposal through reduction, reuse, and recycling programs.

The law requires all California counties in coordination with their respective cities to develop and implement integrated waste management plans. As part of their integrated waste management plans, counties must ensure that a minimum of 15 years of disposal capacity is available to serve the county and its cities. Since 2007, the achievement of waste-diversion rates has been measured based on per-capita disposal rates, expressed in pounds per person per day of wastes disposed of in landfills. To achieve the target waste-diversion rates, the California Department of Resources Recycling and Recovery (CalRecycle) established a target disposal rate of 7.6 pounds per person per day in Marin County in 2018 (CalRecycle, 2018).

Regional and Local Regulations

Marin Hazardous and Solid Waste Management Joint Powers Authority

The Marin Hazardous and Solid Waste Management Joint Powers Authority, referred to as Zero Waste Marin, ensures Marin County's compliance with state recycling mandates and provides residents and businesses with information on household hazardous waste collection, recycling, composting, and waste disposal (Zero Waste Marin, 2020a). Zero Waste Marin was formed by the County of Marin and its incorporated cities and towns (Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Novato, Ross, San Anselmo, San Rafael, Sausalito, Tiburon). It was formed in 1996 to ensure the County's compliance with the waste-diversion disposal goals mandated by California's Integrated Waste Management Act. Zero Waste Marin worked in partnership with County agencies, private waste haulers, and facility operators to develop and implement the Integrated Waste Management Plan to comply with state mandates (Zero Waste Marin, 2020a).

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007).

Public Facilities and Services

Goal PFS-1: Adequate Public Facilities and Services. Provide basic public facilities to accommodate the level of development planned by cities and towns and the County.

> ***Policy PFS-1.1: Require Cost-Sharing.*** Require new development to pay for the infrastructure it requires and the public services it receives.

[2] California Public Resources Code Division 30, Sections 40000-49620.

Policy PFS-1.2: Plan Effectively to Minimize Costs. Plan public facilities in cooperation with service providers to minimize short- and long-term construction, operation, and maintenance costs.

Policy PFS-1.3: Discourage Privatization and Commercialization. Encourage public ownership of utilities and public service facilities by not authorizing privatization of water, sewer, law enforcement, emergency service, school, and other essential services. Consider prohibiting corporate sponsorship and commercially driven naming rights of public facilities and lands as a means to fund maintenance and improvements.

Policy PFS-1.4: Reduce Demand on Public Facilities. Reduce per capita and total demand for water and wastewater treatment, and enhance stormwater management through integrated and cost-effective design, technology, and demand reduction standards for new development and redevelopment.

Goal PFS-2: Sustainable Water Resources. Assure a reliable, sustainable water supply for existing and future development while protecting the natural environment.

Policy PFS-2.1: Conserve Water and Utilize Sustainable Sources. Promote conservation to increase the responsible use and reliability of water supplies. Reduce the waste of potable water through efficient technologies, design, and management practices, and through better matching of the source and quality of water to the user's needs.

Policy PFS-2.2: Mitigate Increased Water Demand in New Development. Work with local water agencies to mitigate increases in water demand due to new development by supporting water efficiency programs that decrease demand by a similar amount.

Policy PFS-2.3: Manage Water Resources Sustainably. Manage water resources to ensure equitable amounts of clean water for all users, to support wildlife habitat, and to preserve natural resources within the sustainable limits of water supplies (See also the Natural Systems and Agriculture Element, Water Resources Section of the Marin Countywide Plan).

Goal PFS-3: Reduction, Safe Processing, and Reuse of Wastewater. Continue to enhance the Alternative Onsite Wastewater Monitoring Program. This program ensures the proper operation of alternative and innovative wastewater system designs. Continue to work with manufacturers, designers, installers, end users, and the Regional Water Quality Control Board to evaluate the effectiveness and capabilities of these alternatives to traditional septic system designs. Work with stakeholders to periodically update design guidelines and regulations in light of evolving best practices.

Policy PFS-3.1: Reduce Toxics in Wastewater. Minimize the potential for pollution to water and other resources from sewage treatment.

Policy PFS-3.2: Promote Alternative Wastewater Systems. Enhance water quality through use of alternative wastewater treatment methods.

Policy PFS-3.3: Reduce Stormwater Volume. Implement appropriate upstream water saving technologies to reduce stormwater volumes and increase percolation. Increase permeable surfaces and encourage onsite percolation to reduce stormwater volume and potential overflow of wastewater treatment facilities.

Goal PFS-4: Efficient Processing and Reduced Landfill Disposal of Solid Waste. Minimize, treat, and safely process solid waste materials in a manner that protects natural resources from pollution while planning for the eventual reuse or recycling of discarded material to achieve zero waste.

Policy PFS-4.1: Reduce the Solid Waste Stream. Promote the highest and best use of discarded materials through redesign, reuse, composting, and shared producer responsibility. Emphasize a closed-loop system of production and consumption.

Policy PFS-4.2: Protect Environmental Health. Require the use of waste processing and disposal techniques that prevent the contamination or other impairment of natural resources.

Policy PFS-4.3: Plan for Waste Transformation or Disposal. Plan for the transformation or elimination of waste materials that cannot be reduced, recycled, or composted.

Policy PFS-4.4: Promote Regulatory Efforts. Support state legislative or regulatory efforts that will aid in achieving zero waste.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related utilities and service systems are applicable to the project (Town of Ross, 2020).

Chapter 12.04 Excavations

12.04.010 Permit Required. It is unlawful for any person to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare, or other public property within the town, for the purpose of laying, replacing or repairing any pipe, conduit or sewer therein, or for any other purpose whatsoever, without first obtaining a permit therefor and making a deposit with the superintendent of streets (Prior code §7100).

12.04.020 Notification to superintendent of streets. Any person desiring to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare or other public property within the town, for the purpose of laying, replacing or repairing any pipe, conduit or sewer therein, or for any other purpose whatsoever, shall, before proceeding with the work, notify the superintendent of streets of the character and extent of the work proposed to be done and obtain from the superintendent of streets a permit to proceed with the work as the same shall be described in the permit (Prior code §7101).

3.15.4 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects;
b. Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that is has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; or
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to utilities and service systems for the project. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. The analysis assesses whether the project would require the construction of new utility infrastructure or relocation of existing infrastructure, the implementation of which may result in adverse environmental effects. For landfill capacity and compliance with solid waste regulations, the analysis compares the quantity of solid waste that would be generated, adjusted to reflect applicable waste-diversion regulations, with available landfill capacity. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.15.5 Impact Discussion

Impact Analyzed

Impact 3.15-1: The project would not require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

Water Facilities

Water facilities near the Corte Madera Creek channel include MMWD water lines and COM utility lines, which may include water. Project construction would require water for the purpose of dust control and soil stabilization. Water trucks would apply water to the site as necessary to control dust. The estimated construction water demand is 642,366 gallons of water. The project water demand would be well below the MMWD operational yield of 6.5 billion gallons of water. The operational water use would also be temporary and would not create a need for additional water treatment capacity.

As described in Section 3.15.2, there are existing water supply lines that cross the creek at Lagunitas Road Bridge and Stadium Way and along Bike Route 20 in Unit 4 and Frederick Allen Park. The locations of these water lines are incorporated into the project design and would be avoided during construction. Clear instructions would be provided to work crews to allow the project to proceed in areas around existing utilities without causing inadvertent damage. If it is determined at any point that an existing infrastructure is at risk, the project would be modified in the final design to avoid the damage existing water lines. The impacts would be less than significant.

Wastewater Treatment and Storm Water Drainage Facilities

Wastewater would be generated during construction from worker sanitary facilities and from process-related use. The minimal amount of wastewater generated by workers and process wastewater generated during construction would not exceed the treatment capacity of the RVSD facilities.

RVSD sanitary sewer lines and MMWD stormwater lines are located within and near the project area. RVSD sewer lines parallel the majority of Corte Madera Creek along Units 4, 3, and 2 and cross Corte Madera Creek at the transition between Unit 4 and 3. MMWD stormwater lines cross the creek just upstream of Lagunitas Road Bridge in Unit 4, at the proposed stormwater pump station in Unit 3, and at several locations throughout Unit 3 and Unit 2. The existing RVSD sewer pipelines locations have been identified and incorporated into the project design. The District will obtain RVSD approval for the design where the creek channel crosses RVSD facilities at the transition from Unit 4 to Unit 3. Locations of sewer and stormwater pipelines are well documented, and construction would be planned around these features. Clear instructions would be provided to work crews to allow the project to proceed in areas around existing utilities without causing inadvertent damage. If it is determined at any point that an existing

infrastructure facility is at risk, the project would be modified in the final design to avoid the danger. The impacts on stormwater and wastewater pipelines would be less than significant.

The project includes construction of a new stormwater facility, the stormwater pump station in the Granton Park area. The stormwater pump station is part of the project, and the impacts from construction of the pump station are addressed in this EIR. Construction of the stormwater pump station will not adversely affect the existing stormwater facilities in the area.

Electric Power, Natural Gas, and Communication System Facilities

Electric power, natural gas, and communication-system facilities near the Corte Madera Creek channel include gas pipelines, electrical lines, and communications and power conduits. As described in Section 3.15.2, the PG&E utility system in the project area consists of underground gas lines and electric conductors crossing and paralleling the creek along various locations in Units 4, 3, and 2. Existing communication services (including cable, telephone, and internet services) in the project area are provided by Comcast and AT&T. The existing power, gas, and communication lines in the project area have been documented. The project has been designed to avoid electric power, natural gas, and communications lines in the area. Prior to construction, the location of utilities will be marked in the field to ensure that workers avoid inadvertent damage to buried electrical, natural gas, and communications lines. If it is determined at any point that an existing utility structure is at risk, the project would be modified to avoid the danger. No electric power, natural gas, or communication-system facilities would be removed or decommissioned. The project would require a new tap to the PG&E electrical line at the stormwater pump station. The electrical line extension would be a few feet from the existing line at Cedar Avenue. Construction of the new electrical connection would not cause any significant environmental effects. The impact on electric power, natural gas, and communications lines would be less than significant for the reasons described above.

Operation and Maintenance

Project operation would not create any permanent employment that could indirectly result in demand for utilities. Operation of the new project components would not require water or generate wastewater. Operation of the project would require a small amount of power to generate the new stormwater pump station and supply of fuel as backup power for the emergency generator. The stormwater pump station would only operate a few days per year (up to 66) during and following storm events when the pump station is needed to avoid flooding in the Granton Park area. The amount of power required for the pump station would not require construction or expansion of any electrical or gas facilities because PG&E has sufficient electrical supply to power the pump station, and the impact would be less than significant.

Operation and maintenance of the project would not create any permanent employment that would indirectly cause new utility demand or indirectly require relocation or construction of new utilities. Therefore, there would be no indirect impact on utility construction, expansion, or relocation.

Mitigation: None required.

	Significance Determination
Impact 3.15-2: The project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

The MMWD supplies water within Marin County, including the project area. The water supply comes from a network of seven local, rain-fed reservoirs. Non-potable water is available from local groundwater wells located in the Town of Ross (Marin County, 2005).

Project construction would require water for the purpose of dust control and soil stabilization. It is estimated that these construction activities could require 642,366 gallons of water during the seven-month construction period. Water trucks would apply water to the site as necessary to control dust. Construction would also use relatively small amounts of potable water for some site needs such as drinking water, hand washing, and other on-site sanitary needs. The increase in water demand would be temporary and limited to the seven-month construction period. Water supplies are planned such that short-term spikes in potable use can be accommodated, and there would be no need for new or expanded water supplies or water-treatment facilities. The MMWD estimated that the operational yield of their reservoirs is about 20,000 acre-feet per year (MMWD, 2016), which equivalent to 6.5 billion gallons per year.[3] The anticipated 642,366 gallons of water needed for project construction in one year would be a fraction of MMWD's capacity. Construction of the proposed project would not require more potable water supply than would be available during normal, dry, or multiple dry years because of the limited amount of water required and short-term nature of the project demand; therefore, the impact on water supplies would be less than significant.

Operation and Maintenance

Operation of the project would not require water and would not create demand for additional water supplies; therefore, no impact on water supplies would occur.

Mitigation: None required.

	Significance Determination
Impact 3.15-3: The project would not result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

During project construction, new sources of wastewater discharges would include wastewater resulting from sanitary needs of construction workers. As described in Chapter 2 Project

[3] One acre foot if 325,851 gallons, water enough to cover one acre to a depth of one foot.

Description, the maximum construction workforce would be approximately 10 workers per day. Assuming that each worker would generate 1.28 gallons per day of wastewater,[4] the total increase in wastewater volumes would be less than 0.001 million gallons per day, an increase well within the dry-weather capacity of the RVSD; therefore, the impact on wastewater treatment capacity would be less than significant.

Operation and Maintenance

The project would not generate wastewater during operations, and no staffed operational facilities are proposed as part of the project. There would be no impact on wastewater treatment capacity during operation and maintenance.

Mitigation: None required.

	Significance Determination
Impact 3.15-4: The project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

As described in Chapter 2 Project Description, demolition and total project earthwork would generate approximately 23,130 cubic yards of demolition debris and soil. Of the 23,130 cubic yards of soil that is excavated, approximately 7,585 cubic yards may be beneficially reused in the project as fill material. The excess excavated soil materials (15,145 cubic yards) would be removed from the site. The demolition debris and soil, including the concrete, is anticipated to be recycled at the Marin Resource Recovery Center. The construction debris that can be reused will not be sent to the landfill and will be recycled or reused on other projects. Materials that cannot be recycled or reused will be sent to the Redwood Landfill and Recycling Center.

Redwood Landfill accepts construction and demolition debris, including concrete, and has a remaining capacity of 26 million cubic yards, which is more than adequate to meet the project's needs (CalRecycle, 2020); therefore, the project would have a less-than-significant impact on solid waste facilities.

Operation and Maintenance

Project operation and maintenance would include sediment removal and vegetation management. Sediment would continue to be removed from portions of the Corte Madera Creek channel including, the new fish pools. The project is designed to restore natural stream processes and would not cause increased sediment removal (see Section 3.9 for further detail). Vegetation and trash removed during routine maintenance would be similar to exiting vegetation and trash removal from Corte Madera Creek. The maintenance activities would

generally be the same as existing conditions (removal of sediment from fish pools) except for in Frederick Allen Park and lower Unit 2 where native vegetation and landscaping would be installed. The native vegetation and landscaping would not be a substantial source of waste that would be sent to a landfill and would not generate increased volume of debris. Materials removed from the site would be composted or beneficially reused to the extent feasible. The impact on landfill capacity would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.15-5: The project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction, Operation, and Maintenance

As discussed in Section 3.15.3, the California Integrated Waste Management Act of 1989 requires municipalities to divert at least 50 percent of all solid waste generated by the year 2000 and establishes the goal of diverting at least 75 percent of generated waste (based on per capita disposal rates) by 2020. In addition, Zero Waste Marin ensures Marin County's compliance with state recycling mandates and provides residents and businesses with information on household hazardous waste collection, recycling, composting, and waste disposal (Zero Waste Marin, 2020b). Once the project is operational, it would generate no measurable volume of solid waste above the amounts that are already removed from creek channels as part of routine maintenance. Trash and debris removed during routine channel maintenance would be sent to permitted landfills for disposal (Marin County Flood Control and Water Conservation District, 2018). This disposal would not result in an inconsistency with or violation of permit conditions at these facilities because the facilities are permitted and have adequate capacity to accept these non-hazardous wastes.

Recycling construction and demolition debris helps local jurisdictions meet state and local waste-diversion goals. As discussed in Impact 3.8-2 in Section 3.8 Hazards and Hazardous Materials, all waste would be transported and disposed of in accordance with all applicable federal, state, and location laws regarding soil and hazardous waste disposal. The project's construction and operation would be subject to applicable statutes and regulations related to solid waste. In addition, all landfills identified by the District for disposal and recycling of construction and demolition debris are permitted for the types of waste generated by project construction and operation and are required to meet federal, state, and local solid waste regulations. The project would comply with applicable federal, state, and local solid waste regulations; therefore, the impact would be less than significant.

Mitigation: None required.

3.15.6 References

California Independent System Operator. (2020). Understanding the ISO. Retrieved June 28, 2020, from https://www.caiso.com/about/Pages/OurBusiness/Default.aspx

CalRecycle. (2018). *Countywide, Regionwide, and Statewide Jurisdiction Diversion / Disposal Progress Report*. Retrieved August 7, 2020, from calrecycle.ca.gov: https://www2.calrecycle.ca.gov/LGCentral/AnnualReporting/DiversionDisposal

CalRecycle. (2020). *Redwood Landfill (21-AA-0001)*. Retrieved November 17, 2020, from SWIF Facility/Site Activity Details: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/3054?siteID=1727

CEC. (2003, May 8). State of California Energy Action Plan. Retrieved June 28, 2020, from https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/2003%20Energy%20Action%20Plan.pdf

CEC. (2008, February). 2008 Update Energy Action Plan. Retrieved June 28, 2020, from https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/2008%20Energy%20Action%20Plan%20Update.pdf

CPUC. (2020, June). About the California Public Utilities Commission (CPUC). Retrieved June 28, 2020, from https://www.cpuc.ca.gov/aboutus/

ESA. (2018). *San Anselmo Flood Risk Reduction Project Final Environmental Impact Report.*

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

Marin County. (2005, November). Hydrology and Water Wuality Technical Background Report for Marin Countywide Plan .

Marin County Flood Control and Water Conservation District. (2018). *Marin County Stream Maintenance Manual.*

Marin Sanitary Service. (2020). Marin Sanitary Service. Retrieved October 2, 2020, from https://marinsanitaryservice.com/

MMWD. (2016, June). Urban Water Management Plan .

MMWD. (2016, June). Urban Water Management Plan 2015 Update.

MMWD. (2020). Marin Water District Fact Sheet. Retrieved July 6, 2020, from https://www.marinwater.org/DocumentCenter/View/296/Meet-MMWD-Informational-Booklet?bidId=

RSVD. (2020). About Us. Retrieved July 14, 2020, from https://rvsd.org/27/About

Town of Ross. (2007, June). Town of Ross General Plan.

USACE. (2010, December). Corte Madera Creek Flood Control Study Baseline Report.

Waste Management. (2020). Redwood Landfill. Retrieved from https://redwoodlandfill.wm.com/index.jsp

Zero Waste Marin. (2020a). What is Zero Waste? Retrieved October 5, 2020, from https://zerowastemarin.org/who-we-are/what-is-zero-waste/

Zero Waste Marin. (2020b). *Zero Waste Marin*. Retrieved from https://zerowastemarin.org/

3.16 Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics

3.16.1 Introduction

This section presents the environmental setting and impact analysis for agriculture and forestry resources, mineral resources, land use and planning, population and housing, and wildfire in the project area. Included in this section is a description of existing conditions as well as an evaluation of the potential effects on agriculture and forestry resources, mineral resources, land use and planning, population and housing, wildfire, and socioeconomics from implementation of the project.

3.16.2 Environmental Setting

Agricultural Resources

In Marin County, farms and ranches account for approximately 50 percent of the land, or 167,000 acres, with dairies and livestock ranches dominating (University of California Cooperative Extension, 2011). However, within the Town of Ross and unincorporated Kentfield, there are no zoned agricultural lands (MarinMap, 2020). The project involves improvements to Corte Madera Creek, which is located in an urban area of Marin County. The California Department of Conservation's Farmland Mapping and Monitoring Program designates the project area as Urban and Built-Up Land. These areas are defined as "…land [that] is occupied by structures with a building density of at least 1 unit to 1.5 acres… Common examples include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures." No portion of the project area is under a Williamson Act contract (DOC, 2020).

Forestry Resources

Marin County, including Ross Valley, is widely known for its diverse natural beauty, including forested landscapes. While there is no timber production within Ross Valley, there is a mixture of forested vegetation that provides aesthetic, recreational, and environmental benefits. The project area is not zoned for forest land or timberland uses. No national or state forest lands are mapped in the watershed. Frederick Allen Park contains over 100 trees that provide a dense tree canopy. While Frederick Allen Park contains trees, the area is a public park and has been landscaped as a park. The trees within Frederick Allen Park are not subject to commercial harvesting or other forest uses. No commercial harvesting of forestry resources occurs within Frederick Allen Park or any portion of the project area.

Mineral Resources

Eight sites within Marin County are designated by the State as having significant mineral resources, and four additional sites are Marin County permitted resource sites (Marin County Community Development Agency , 2007). Based on review of Map 3-5, Location of Mineral Resource Preservation Sites, from the 2007 Marin Countywide Plan, there are no State of California Designated Mineral Resources Sites or Marin County Permitted Mineral Resource Sites in the project area. Further, the project area is mapped by the California Department of Conservation Division of Mines and Geology as Mineral Resource Zone 1 (MRZ-1), indicating that substantial mineral resources do not occur within these areas (DOC, 2020f).

Land Use and Planning

The Town of Ross is the second smallest of Marin's communities, with 1.6 square miles and slightly more than 800 residential parcels (Town of Ross, 2007). Unincorporated Kentfield has a population of approximately 11,854 and totals 3 square miles (Statistical Atlas, 2020).

The project is located in a developed suburban residential and commercial area. On-site land uses consist of the Corte Madera Creek bed, trails and bike paths, public parks and open space, residential uses, and schools and colleges. Frederick Allen Park is a linear park owned and maintained by the Town of Ross and located just south of the Post Office on Ross Common Road. The park is adjacent to Bike Route 20, a bicycle route that runs from the Larkspur Ferry Terminal to Fairfax.

A variety of land uses occur adjacent to Corte Madera Creek. Within Unit 4, adjacent land uses include residential housing (predominantly single-family), parking facilities, a bicycle -pedestrian pathway, Station Park, and Ross Common Park. Ross Town Hall and Ross Valley Fire Department (RVFD) Station 18 abut the creek on the left bank north of Lagunitas Road Bridge. Land uses adjacent to Unit 3 support a mix of residential, commercial, and public uses. Residential uses occur on both sides of the creek to Kentfield Hospital. Downstream of Kentfield Hospital, the concrete channel is bordered by residential uses to the College of Marin. South of College Avenue, the land uses adjacent to the concrete channel include a mix of commercial uses, residential use, Kent Middle School, and College of Marin recreational fields. The land uses and zoning designations adjacent to the project area are described by Unit in Table 3.16-1.

Population and Housing

Regional Setting

In 2020, Marin County's population was approximately 260,831. Marin County's growth rate is projected to decline, and the Town of Ross's growth rate is projected to increase, as shown in Table 3.16-2. Marin County had approximately 112,516 households, with an average of 2.40 persons per household, as shown in Table 3.16-3 (Department of Finance, 2020a). If both vacant and underdeveloped lots were developed, approximately 15,200 new housing units, including both single-family and multi-family, could be added countywide (Marin County Community Development Agency, 2007).

Table 3.16-1 General Plan Land Use Designations and Zoning in Project Vicinity

Unit	Element	Jurisdiction	Zoning	General Plan Land Use Designation
Unit 4	Fish ladder removal and Unit 4 grading	Town of Ross	Single Family Residential, Public and Quasi Public[a]	Public Service, Public Park and Open Space, Low-Density Residential, Medium-Low-Density Residential
Unit 3	Frederick Allen Park	Town of Ross	Single Family Residential, Public and Quasi Public, Flood Control Area	Medium-Low-Density Residential, Multi-Family Residential, Public Park and Open Space
	Fish pools	Town of Ross	Single Family Residential, Public and Quasi Public, Flood Control Area, Public Facilities	Single Family Residential, Public Facilities, Public Park and Open Space
	Floodwall (segment #3)	Town of Ross and Unincorporated Kentfield	Single Family Residential, Public and Quasi Public, Flood Control Area, Public Facilities	Park and Open Space, Medium Low Density Residential
	Stormwater pump station	Unincorporated Kentfield	Single Family Residential, Public Facilities	Public Facilities, Tax Exempt
	Floodwall (segment #2)		Residential Commercial Multiple Planned	Public Facility, Single Family Residential
Unit 2	Floodwall (segment #1)	Unincorporated Kentfield	Public Facilities; Residential Two Family	Neighborhood Commercial Mixed Use
	Lower College of Marin Concrete Channel Removal	Unincorporated Kentfield	Public Facilities; Residential Two Family	Neighborhood Commercial Mixed Use, Public Facility, Multifamily Residential
N/A	Staging areas	Town of Ross and Unincorporated Kentfield	Single Family Residential, Public and Quasi Public, Flood Control, Public Facilities, Residential Commercial Multiple Planned	Tax Exempt, Public Facility, Public Park and Open Space, Residential

Note

[a] Quasi public category is established for land owned by a non-governmental agency that is used as an institution serving the public.

Table 3.16-2 Population and Growth Rates of Marin County and Town of Ross

Region	Population				Growth Rates (%)		
	2010	2015	2020	2050 (Projected)	2010-2015	2015-2020	2020-2050 (Projected)
Marin County	252,409	262,743	260,831	247,437	+4.09	-0.72	-5.13
Town of Ross	2,415	2,544	2,550		+5.34	+0.24	

Source: (Department of Finance, 2020a; Department of Finance, 2020b)

Table 3.16-3 Marin County Housing Demographics

Information Category	1980 Actual	1990 Actual	2000 Actual	2010 Actual	2020 Actual	Theoretical Buildout
Households	88,723	95,006	100,650	103,210	112,516	118,728
Average household size	2.43	2.33	2.34	2.36	2.40	2.36

Note: The Countywide Plan does not include projections that estimate the time by which a certain level of development is projected to occur. Instead, tables of statistics are presented for the County and for each of the seven planning areas; these tables identify four benchmarks by which to measure trends: U.S. Census Bureau counts of population, households, employed residents, and jobs for the years 1980, 1990, and 2000. They also include a projection of development that could occur if land vacant and underutilized in 2004 were fully developed pursuant to the zoning designations of city and County general plans.

Sources: (Marin County Community Development Agency, 2007; US Census Bureau, 1980; US Census Bureau, 1990; Bay Area Census, 2020).

Town of Ross

The Town of Ross is the second smallest of Marin's communities, with 1.6 square miles and slightly more than 800 residential parcels. Between 1990 and 2005, the population grew by 214 people, which is about the same rate of growth as Marin County as a whole. In 2020, the Town of Ross's population was approximately 2,550 (Department of Finance, 2020a). There were 2,498 households, with an average of 3.02 persons per household.

Kentfield

Unincorporated Kentfield within Marin County had a population of approximately 6,485 in 2010 (US Census Bureau, 2019). There were approximately 2,630 households from 2014 to 2018, and 2.62 persons per household.

Wildfire

Wildfire is common in many places around the world, including many of the forested areas of the United States, where the climates are sufficiently moist to allow the growth of trees but feature extended dry, hot periods when fallen branches, leaves, and other material can dry out and become highly flammable (USACE, 2018).

The Town of Ross and unincorporated Kentfield are all listed as wildland–urban interface communities but are not within the very high fire hazard severity zone(FIRESafe MARIN, 2020; CAL FIRE, 2008). A State Responsibility Area (SRA) is immediately adjacent to the project area (Marin County, 2020). Refer to Section 3.8 Hazards and Hazardous Materials for more information on wildfire hazards.

Socioeconomics

The three largest ethnic groups in Marin County are White (Non-Hispanic), White (Hispanic), and Asian (Non-Hispanic). Marin County has a population of 260,831 people in 2020, with median age of 47.4 and median household income of $126,373 (DataUSA, 2018). Approximately eight percent of the population lives below the poverty line in Marin County, which is lower than the national average of 13.1 percent (DataUSA, 2018).

The largest industries in Marin County are professional, scientific and technical services, health care and social assistance, and retail trade. The highest-paying industries are finance and insurance, professional, scientific and technical services, and information (DataUSA, 2018). From 2017 to 2018, employment in Marin County grew at a rate of 5.32 percent. The most common job groups are management occupation, sales and related occupations, and business and financial operations occupations (DataUSA, 2018).

3.16.3 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

State Regulations

Farmland Mapping and Monitoring Program

The Department of Conservation established the Farmland Mapping and Monitoring Program to help assess the location, quantity, and quality of agricultural lands and the conversion of these lands to nonagricultural uses (DOC, 2020). The Farmland Mapping and Monitoring Program uses Natural Resources Conservation Service soil classifications, land inventories, and monitoring criteria to prepare digitized maps of farmland in California. These maps and associated statistics are updated every two years and are used in general plans, regional studies of agricultural land conversion, and in assessing project impacts on farmland.

California Land Conservation Act (Williamson Act)

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is a nonmandated state program administered by counties and cities to preserve agricultural land and discourage the premature conversion of agricultural land to urban uses. The act authorizes local governments and property owners to (voluntarily) enter into contracts to commit agricultural land to specified uses for 10 or more years. Once restricted, the land is valued for taxation based on its agricultural income rather than unrestricted market value, resulting in a lower tax rate for owners. In return, the owners guarantee that these properties remain under agricultural production for an initial 10-year period. The contract is renewed automatically unless the owner files a notice of nonrenewal, thereby sustaining contiguous 10-year contracts.

Participation is on a voluntary basis by both landowners and local governments and is implemented through the establishment of agricultural preserves and the execution of Williamson Act contracts.

California Public Resources Code

Section 4526

This section defines "timberland" as land, other than land owned by the federal government and land designated by the board as experimental forest land, that is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis.

California Government Code

Section 51104(g)

This section defines a "timberland production zone" or "TPZ" as an area that has been zoned pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber or for growing and harvesting timber and compatible uses, as defined in subdivision (h).

Government Code

Section 65300

State law (Government Code, Section 65300) requires that each county and city, including charter cities, prepare and adopt a comprehensive, long-term general plan for future development. This general plan must contain the following seven elements: (1) land use; (2) circulation; (3) housing; (4) conservation; (5) open space; (6) noise; and (7) safety (Government Code, Section 65302). Of these, state law mandates that the land-use element must correlate with the circulation element. In addition to these, state law permits cities and counties to include optional elements in their general plans, thereby providing local governments with the flexibility to address the specific needs and unique character of their jurisdictions. California law also requires that the day-to-day decisions of a city or county follow logically from and be consistent with the general plan. More specifically, Government Code Sections 65860, 66473.5, and 66474, require that zoning ordinances and subdivision and parcel map approvals be consistent with the general plan. Goals, objectives, and programs established for each element of the general plan must meet the existing and future needs and desires of the community. These goals, objectives, and programs are specific, action-oriented, and promoted during the life of the general plan and are applicable to the goals and objectives of the project.

Section 65402(b)

State law (Government Code Section 65402[b]) requires the District to notify cities of its plans to construct projects or acquire extraterritorial property within the city's jurisdiction. Cities then have 40 days to determine project consistency with their general plans. These consistency determinations are advisory to the District rather than binding.

Building and zoning ordinances represent the most specific expressions of general plan goals, objectives, and policies. State law and judicial interpretation of state law (California Government Code, Section 53091 et seq.) mutually exempt cities and counties from complying with each other's building and zoning ordinances.

Defensible Space for Fire Protection

State of California regulations regarding defensible space requirements are contained in section 4291 of the Public Resources Code (PRC) and Section 51182 of the California Government Code. The PRC primarily directs the creation of defensible space in State Responsibility Areas, while the California Government Code sets the fuel-treatment requirements in local responsibility areas that are designated as very high hazard severity zones. Both codes generally include a requirement to maintain defensible space of 100 feet from each side and from the front and rear of structures but not beyond the property line except under specific circumstances, which would be applicable to the project.

State Board of Forestry and Fire Protection – 2018 Strategic Fire Plan

The Board of Forestry and Fire Protection (Board) developed and adopted the Strategic Fire Plan pursuant to the direction provided under Public Resources Codes Sections 4114 and 4130 regarding fire protection plan development. The Board has adopted these Plans since the 1930s and periodically updates them to reflect current and anticipated needs. The 2018 Plan reflects CAL FIRE's focus on (1) fire prevention and suppression activities to protect lives, property, and ecosystem services and (2) natural-resource management to maintain the state's forests as a resilient carbon sink to meet California's climate change goals and to serve as important habitat for adaptation and mitigation. Additionally, the continued inclusive collaboration among local, state, federal, tribal, and private partners remain paramount to effectively manage towards a more fire-resilient wildland–urban interface and natural environment. Through government and community collaboration, the following goals are intended to enhance the protection of lives, property, and natural resources from wildland fire as well as to improve environmental resilience to wildland fire, all of which would apply to this project:

1. Identify and evaluate wildland-fire hazards and recognize life, property, and natural resource assets at risk, including watershed, habitat, social, and other values of functioning ecosystems. Facilitate the collaborative development and sharing of all analyses and data collection across all ownerships for consistency in type and kind.
2. Promote and support local land-use planning processes as they relate to: (a) protection of life, property, and natural resources from risks associated with wildland fire and (b) individual-landowner objectives and responsibilities.
3. Support and participate in the collaborative development and implementation of local, county, and regional plans that address fire protection and landowner objectives.

4. Increase fire-prevention awareness, knowledge, and actions implemented by individuals and communities to reduce human loss, property damage, and impacts to natural resources from wildland fires.
5. Integrate fire and fuels management practices with landowner/land manager priorities across jurisdictions.
6. Determine the level of resources necessary to effectively identify, plan, and implement fire prevention using adaptive management strategies.
7. Determine the level of fire suppression resources necessary to protect the values and assets at risk identified during planning processes.
8. Implement post-fire assessments and programs for the protection of life, property, and natural-resource recovery.

Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 was enacted to encourage the production, conservation, and protection of California's mineral resources (DOC, 2019). Together, the DOC's Office of Mine Reclamation and the State Mining and Geology Board oversee administration of the Act's requirements. The State Mining and Geology Board designates areas of statewide or regional significance. As described above, eight sites in Marin County have been designated as having significant mineral resources.

Regional and Local Regulations

Plan Bay Area – Association of Bay Area Governments

Plan Bay Area is a long-range integrated transportation and land-use/housing strategy through 2040 for the San Francisco Bay Area. On July 26, 2017, the plan was jointly approved by the Association of Bay Area Governments Executive Board and by the Metropolitan Transportation Commission. The plan includes the region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan and represents the next iteration of a planning process that has been in place for decades. Plan Bay Area marks the nine-county region's first long-range plan to meet the requirements of California's landmark 2008 Senate Bill 375, which calls on each of the state's 18 metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas emissions from cars and light trucks. Developed in collaboration with cities and counties, the plan advances initiatives to expand housing and transportation choices, create healthier communities, and build a stronger regional economy (MTC and ABAG, 2017).

Marin Countywide Plan

The following goals and policies related to agriculture and forestry resources, mineral resources, land use and planning, population and housing, wildfire, and socioeconomics in the Marin Countywide Plan are relevant to the project (Marin County, 2007).

Forestry

Goal DES-1.3: Encourage Sustainable Urban Forestry. Promote the use of sustainable urban forestry practices that address long-term forest management, public education, and outreach.

Community Development

Goal CD-2: Balanced Communities. Maintain balanced communities that house and employ persons from all income groups and provide the full range of needed facilities and services.

> ***Policy CD-2.8: Limit Development in Resource or Hazard Areas.*** Discourage development in areas with high natural resource value or threats to life or property, and restrict development in such areas to minimize adverse impacts.

Goal CD-4: Coordinate Planning with Other Jurisdictions. Coordinate implementation of the Countywide Plan with community plans and planning efforts by local cities, towns, and special districts, and adjacent counties, as well as regional, State, and federal agencies.

> ***Policy CD-4.4: Provide a Forum to Monitor Issues of Concern.*** Provide periodic forums with the cities and towns, other local agencies, and members of the public to engage in discussions on issues of mutual concern, such as more-efficient delivery of services, and to promote the sharing of ideas, information, resources, and best practices for Marin.

Goal CD-2: Balanced Communities. Maintain balanced communities that house and employ persons from all income groups and provide the full range of needed facilities and services.

> ***Policy CD-2.8: Limit Development in Resource or Hazard Areas.*** Discourage development in areas with high natural resource value or threats to life or property, and restrict development in such areas to minimize adverse impacts.

Socioeconomics

Goal EC-1: A Vibrant Economy. Establish and Maintain a diverse and sustainable local economy.

> ***Policy EC-1.5: Consider the Impacts of Climate Change.*** Identify strategies to protect the economy from the impacts of seal level rise, natural disasters, and diseases outbreaks.
>
> > *Implementing Programs EC-1.o*: *Incorporate Economic Impacts of Climate Change into Planning.* Consider integrating economic disaster planning into disaster preparedness and mitigation plans, and analyze impacts to the economy from climate change.

Marin County Native Tree Preservation Ordinance

Marin County adopted the Native Tree Preservation and Protection Ordinance (Ordinance No. 3341) in 2002. This ordinance provides for the preservation and protection of native trees in unincorporated portions of Marin County through limiting the removal of protected trees and requiring replacement plantings for trees that are removed.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related to agriculture and forestry resources, mineral resources, land use and planning, population and housing, wildfire, and socioeconomics are applicable to the project (Town of Ross, 2020).

Chapter 12.24 Planting, Alteration, Removal, or Maintenance of Trees

> **12.24.080 Tree Alteration or Removal Permits and Appeals.** The Public Works Director shall review and approve, conditionally approve, or deny a Tree Alteration or Removal Permit application if no other entitlements are required. The Public Works Director shall give written notice to the applicant of his or her decision on the application within 30 days. The Public Works Director may refer an application directly to the Town Council for consideration. If native species are removed, replacement trees shall be of a species native to those lands that now constitute the Town of Ross, or a non-native species approved by town staff based on specific site circumstances. Replacement trees should have the same mature size as the trees that have been removed, unless town staff recommends otherwise based on specific site circumstances. If there is a conflict between arborists regarding the condition or structure of a tree, the town arborist's decision shall control. The Town Council or Public Works Director may reduce the number of replacement trees or the tree replacement ratio, as applicable, if the reduction will not negatively impact the environmental functions and value of the urban forest or the aesthetic values of the community. The applicant shall complete tree replacement within sixty (60) days of tree removal, unless the Town has approved a longer time. Failure to plant required tree replacement may subject the property owner to Administrative Penalties under Chapter 9.70 until the replacement trees are planted.

Chapter 14.04 California Fire Code

Wildland–Urban Interface Fire Area. A geographical area identified by the Town of Ross as a "Fire Hazard Severity Zone" in accordance with the Public Resources Code, Sections 4201 through 4204, and California Government Code, Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires, as designated on the map titled Town of Ross Wildland–Urban Interface, dated August 12, 2018, or any map or future map that is adopted to supersede the current map.

Chapter 15.05 California Building Code

Wildland-Urban Interface Fire Area is a geographical area identified by the state as a "Fire Hazard Severity Zone" in accordance with Public Resources Code Sections 4201 through 4204 and California Government Code, Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires. Within the Town of Ross, the Wildland–Urban Interface Fire Area shall include the areas shown on the Wildland–Urban Interface Map adopted by the Town Council and on file with the Town Clerk.

Town of Ross General Plan
The following policy of the Ross General Plan related to mineral resources, land use and planning, population and housing, wildfire, and socioeconomics is applicable to the project (Town of Ross, 2007).

Housing Element
Housing Goal - Protect and Enhance Existing Housing, Community Character, and Resources. Maintain the high quality of existing housing and community character, and assure energy efficiency in new and existing housing.

Kentfield/Greenbrae Community Plan
The following goal of the Kentfield/Greenbrae Community Plan related to mineral resources, land use and planning, population and housing, wildfire, and socioeconomics is applicable to the project (Kentfield Greenbrae Planning Group and Marin County Planning Department, 1987).

Goal 10: To the greatest extent possible, preserve the natural beauty and view corridors of the planning area. Protect and enhance environmental resources in accordance with policies of the Countywide Plan.

3.16.4 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines the project could have a significant impact if it would:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract;
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220[g]), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104[g]);
d. Result in the loss of forest land or conversion of forest land to non-forest use; or
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.
f. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state;

g. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan;
h. Physically divide an established community;
i. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect;
j. Result in substantial alteration of the character or functioning of the community, or present planned use of an area;
k. Conflict with applicable Countywide Plan designation or zoning standards;
l. Induce substantial unplanned population growth in an area, either directly or indirectly; or
m. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.
n. Increase density that would exceed official population projections for the planning area within which the project site is located as set forth in the Countywide Plan and/or community plan;
o. Displace existing housing, especially affordable housing; or
Result in physical changes which can be traced through a chain of cause and effect to social or economic impacts.

If located in or near State Responsibility Areas or lands classified as very high fire hazard severity zones, the project could have significant impact if it would:

p. Substantially impair an adopted emergency response plan or emergency evacuation plan;
q. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
r. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or
s. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.
Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to land use and planning, population and housing, and wildfire impacts in the project area. This section includes an analysis of potential short-term (construction) and long-term (operation and

maintenance) impacts of the project. Impact evaluations are assessed based on the existing conditions described above. Mitigation measures are identified, as necessary, to reduce significant impacts. The analysis considers the project, Appendix G of the CEQA Guidelines, existing conditions, and applicable regulations, plans, and policies.

3.16.5 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. Criterion **(a):** The project area is designated as Urban and Built-Up Land, and there is no land containing Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, implementation of the project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use, nor would it impair the productivity of prime agricultural land. There would be no impact.
2. **Criterion (b):** Implementation of the project would not conflict with existing zoning for agricultural land or a Williamson Act contract because none of the project area is zoned for agricultural use or includes lands under a Williamson Act contract. No other agricultural resources, operations, or contracts exist. There would be no impact.
3. **Criterion (c):** The project would not conflict with zoning for forestry resources because the project area is not zoned as forest land, timberland, or Timberland Production by the County or Town of Ross.
4. **Criterion (d):** The project would not result in loss of forestland or conversion of forestland to non-forest use because no forestland occurs within the project area. The trees located within the area are part of the urban landscape and do not constitute forestland.
5. **Criterion (e):** The project would not result in any other changes in the existing environment that could result in the conversion of Farmland to non-agricultural use because the project is not located within designated Farmland. The project would not result in any other changes in the environment that would convert forestland to non-forest uses because the flood-risk management project is compatible with forest uses outside of the project area.
6. **Criterion (f):** The project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state because the project area does not contain any known mineral resource sites.
7. **Criterion (g):** The project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land-use plan because the project area does not contain any locally important mineral resource recovery sites.

8. **Criterion (k):** The project would not displace any housing and therefore would not necessitate construction of replacement housing. There would be no impact during construction or operation of the project.
9. **Criteria (q) (r) (s) (t) (u):** The project area is not located in or near a state responsibility area or a very high fire hazard severity zone. The criteria are therefore not applicable to the project. Further, the project lies upon relatively flat ground and within and adjacent to a creek. The project would not expose people to pollutant concentrations from wildfire or the uncontrolled spread of a wildfire and there would be no impact.
10. **Criterion (o):** The project would not displace existing housing or affordable housing. There would be no impact.
11. **Criterion (p):** The project would reduce flood risk and create habitat. The project would not cause other physical changes in the environment that are tied to social or economic impacts. There would be no impact.

Impacts Analyzed

	Significance Determination
Impact 3.16-1: The project would not physically divide an established community.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Overview

Physical division of an established community would typically involve construction of a physical barrier to neighborhood access, such as a new freeway or removal of a means of access, such as a bridge or a roadway, which would not occur under the project. The creek corridor is a physical barrier between neighbors. Paths along the creek provide pedestrians and bicyclists connections through this corridor and impacts to those pathways could be construed as dividing an established community.

Construction

Construction of the project would involve the temporary closure of Frederick Allen Park and the bicycle and pedestrian path through Frederick Allen Park for up to seven months. The project would also require temporary closure of informal walking paths on the left bank during installation of new floodwall segments in Units 2 and 3 as well as temporary closure of an informal levee path during construction of the lower College of Marin concrete channel removal. The informal paths would be closed for up to two months. The bikeway and path closures would be temporary, and access would be restored post construction. In addition, access would be available through the neighborhood and community on existing city streets, which would not be affected by construction; therefore, the project would not physically divide an established community, and impacts would be less than significant.

Operation and Maintenance

The multi-use path through Frederick Allen Park would be realigned, and access would remain through Frederick Allen Park through operation and maintenance of the project. The project would not have long-term impacts on other pathways through the area. No impact would occur.

Mitigation: None required.

Impact 3.16-2: The project would not cause a significant environmental impact due to a conflict with any land-use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	Significance Determination
	Construction: No Impact
	Operation and Maintenance: No Impact

Conflicts with land-use plans, policies, and regulations do not necessarily indicate a significant environmental land-use impact under CEQA unless a project substantially conflicts with a land-use plan or policy that was adopted for the purpose of avoiding or mitigating an environmental effect such that a substantial adverse physical change in the environment related to land use would result. To the extent that physical-environmental impacts may result from such conflicts, the physical impacts are evaluated under the relevant environmental-topic environmental resource sections.

The project is consistent with the goals of Plan Bay Area, the project would reduce flood risk in existing neighborhoods as discussed further in Section 3.9 Hydrology, thereby building a stronger and more functional housing community. The project is subject to the land-use policies contained within the Marin Countywide Plan, Town of Ross General Plan, and Kentfield/Greenbrae Community Plan. Table 3.16-4 lists the relevant policies and provides a rationale and a preliminary determination as to whether the project would conflict with those policies. Whether the project is consistent with particular plans will be determined at the time of project approval by the agency charged with making that consistency determination. The project would not conflict with land-use policies that were adopted for the purpose of avoiding or mitigating an environmental effect. No impact would occur.

Mitigation: None required.

Table 3.16-4 Applicable Land Use Policies Adopted to Avoid or Mitigate an Environmental Effect

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	Marin Countywide Plan	
Goal AIR-1	**Improved Regional Air Quality.** Promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area.	**Consistent.** Long-term operation of the project would not result in an increase in airborne pollutants within the County or the Bay Area. However, short-term particulate emissions would be generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOCs), particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter. As discussed in Section 3.2, Impact 3.2-2, air quality emissions would not exceed any air quality standards set by BAAQMD. In addition, the project would implement the fugitive dust control best management practices consistent with BAAQMD requirements; therefore, the project is consistent with Goal AIR-1 and Policy AIR-1.2.
Policy AIR-1.2	**Meet Air Quality Standards.** Seek to attain or exceed the more stringent of federal or State Ambient Air Quality Standards for each measured pollutant.	
Policy AIR-1.3	**Require Mitigation of Air Quality Impacts.** Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.	**Consistent.** The project is consistent with this policy because the project would not generate a significant level of air pollutants as discussed in Section 3.2, Impact 3.2-2.
Implementing Program AIR-1.g	**Require control measures for construction and agricultural activity.** Require reasonable and feasible measures to control particulate emissions (PM-10 and PM-2.5) at construction sites and during agricultural tilling activity, pursuant to the	**Consistent.** Mitigation Measure 3.2-2 requires implementation of these BAAQMD's fugitive dust Basic Control Measures, which would meet BAAQMD CEQA Air Quality Guidelines requirements for fugitive dust emissions. The project is consistent with this implementing program.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	recommendations in the BAAQMD CEQA Guidelines, which may include the following: • Watering active construction or agricultural tilling areas. • Covering hauled materials. • Paving or watering vehicle access roads. • Sweeping paved and staging areas	
Goal AIR-4	**Minimization of Contributions to Greenhouse Gases**. Prepare policies that promote efficient management and use of resources in order to minimize greenhouse gas emissions. Incorporate sea level rise and more extreme weather information into the planning process.	**Consistent.** Sea level rise was incorporated into the hydrology modeling analysis of the project as discussed in Section 3.9. The project is consistent with this goal.
Implementing Program AIR-4.c	**Reduce Methane Emissions Released from Waste Disposal.** Encourage recycling, decrease waste sent to landfills, require landfill methane recovery, and promote methane recovery for energy production from other sources. (See Goal PFS-3.)	**Consistent.** The project's demolition debris and soil, including concrete, would be recycled at the Marin Resource Recovery Center. Construction materials would be disposed of appropriately to meet recycling requirements. The project is consistent with this implementing program.
Goal BIO-1	**Enhanced Native Habitat and Biodiversity.** Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.	**Consistent.** As documented in Section 3.3, background research and reports have been completed to identify sensitive biological resources in the project area, including wetlands, special-status plants and wildlife, sensitive natural communities, and native trees. Analyses have been conducted to determine the potential for project impacts on these resources and appropriate mitigation measures to minimize the potential for significant impacts. The project is consistent with this goal.
Policy BIO-1.1	**Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife**	**Consistent.** Section 3.3 describes the biological resources in the project area, evaluates the project's potential impacts on

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	Nursery Areas and Movement Corridors. Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local agencies and resource management agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.	those responses, and identifies appropriate mitigation measures to minimize those impacts. Implementation of the mitigation measures identified in Section 3.3 would protect sensitive biological resources, wetlands, migratory species, and wildlife movement corridors. Therefore, the project would be consistent with this policy.
Policy BIO-1.3	**Protect Woodlands, Forests, and Tree Resources**. Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas	**Consistent.** As discussed in Chapter 2 Project Description and Section 3.3, implementing the project would involve removal of 369 trees. In addition, construction activities could indirectly affect native trees by damaging roots, compacting soils, and altering drainage patterns. Mitigation Measure 3.3-2b requires mitigation for tree removal in accordance with this policy and the Native Tree Preservation and Protection Ordinance ; therefore, the project would be consistent with this policy.
Policy BIO-1.6	**Control Spread of Invasive Exotic Plants**. Prohibit use of invasive species in required landscaping as part of the discretionary review of proposed development. Work with landowners, landscapers, the Marin County Open Space District, nurseries, and the multi-agency Weed Management Area to remove and prevent the spread of highly invasive and noxious weeds. Invasive plants are those plants listed in the State's Noxious Weed List, the California Invasive Plant Council's list of Exotic Pest Plants of Greatest Ecological Concern in California, and other priority species identified by	**Consistent.** As discussed in Section 3.3, project construction could introduce invasive species to the project area through weeds on construction equipment or worker boots/waders. Mitigation measures identified in Section 3.3 would require washing of vehicles, cleaning equipment, and defining specific requirements to ensure construction equipment and materials are free of invasive species. Implementing these mitigation measures would prevent introduction of invasive plant species to the project area. Therefore, the project would be consistent with the County's efforts to control spread of invasive plants.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	the agricultural commissioner and California Department of Agriculture.	
Policy BIO-2.3	**Preserve Ecotones.** Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodlands and forests where they transition to grasslands and other habitat types.	**Consistent.** As discussed in Section 3.3, implementation of the project would temporarily impact 0.55 acre of riparian habitat and remove oak trees. The project would result in a net increase in riparian and wetland habitat. Mitigation measure identified in Section 3.3 would ensure successful restoration of riparian areas and replacement of oak woodland habitat. With implementation of mitigation measures, the project would be consistent with this policy.
Policy BIO-2.4	**Protect Wildlife Nursery Areas and Movement Corridors.** Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.	**Consistent.** As discussed in Section 3.3, implementation of the project would remove trees that could provide nesting sites for migratory birds or raptors. The District would implement mitigation measures to define avoidance buffers for tree removal to avoid disruption of bird nesting activities and ensure successful restoration of riparian areas to offset impacts from tree removal. The project would also implement mitigation for tree replacement. Project impacts to nesting habitats would be less than significant with mitigation. Therefore, the project would be consistent with the County's efforts to protect wildlife nursery areas and movement corridors.
Policy BIO-2.5	**Restrict Disturbance in Sensitive Habitat During Nesting Season.** Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should	**Consistent.** Mitigation Measures 3.3-1d and 3.3-2b define procedures to avoid nesting bird impacts consistent with this policy. With the implementation of these mitigation measures, the project would be consistent with County policy to minimize disturbance to sensitive habitat during the nesting season.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	be conducted by a qualified professional when development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.	
Policy BIO-2.8	**Coordinate with Trustee Agencies.** Consult with trustee agencies (the CDFW, USFWS, NOAA Fisheries, USACE, USEPA, RWCQB, and BCDC) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected. Goal BIO-3: Wetland Conservation. Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.	**Consistent.** Prior to preparation of the EIR all trustee agencies received a Notice of Preparation and were asked to submit comments on environmental concerns. As discussed in Section 3.3, the appropriate permits and approvals would be obtained from responsible agencies, including CDFW, RWQCB, NMFS, and USACE. The project is consistent with this policy.
Goal BIO-4	**Riparian Conservation.** Protect and, where possible, restore the natural structure and function of riparian systems.	**Consistent.** The project would result in a net creation of riparian habitat within new floodplain areas. Therefore, the project is consistent with the County's riparian conservation policy.
Policy BIO-4.4	**Promote Natural Stream Channel Function**. Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be	**Consistent.** The proposed project is a flood risk management project that would include project elements to restore Corte Madera Creek within the project area to a more natural state, including replacing the concrete channel in Frederick Allen Park with a wider earthen channel and floodplain and removing the lower College of Marin concrete channel to restore natural creek function. The project would also involve project elements that enhance creek habitat. Habitat enhancement includes increasing the natural condition both in the channel and adjacent to the creek by removing concrete and structures that

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows sufficient capacity and natural channel migration, and allows reestablishment of woody trees and shrubs without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible. (Details in setbacks and other aspects of stream corridors are in Section 2.4 of the Marin Countywide Plan.)	restrict flow, obstruct fish passage, or block natural vegetation establishment. Accordingly, the project is consistent with the County's policy to promote natural stream channel functions.
Policy BIO-4.5	**Restore and Stabilize Stream Channels**. Pursue stream restoration and appropriate channel redesign where sufficient right-of-way exists that includes the following: a hydraulic design, a channel plan form, a composite channel cross-section that incorporates low flow and bankfull channels, removal and control of invasive exotic plant species, and biotechnical bank stabilization methods to promote quick establishment of riparian trees and other native vegetation.	**Consistent.** The project has been designed to include stream restoration and appropriate channel design for portions of Corte Madera Creek within Unit 4, Frederick Allen Park and lower Corte Madera Creek. The project design in Frederick Allen Park incorporates low flow and bankfull channels and biotechnical bank stabilization methods using riparian trees and native vegetation. The project is consistent with this policy.
Policy BIO-4.6	**Control Exotic Vegetation**. Remove and replace invasive exotic plants with native plants as part of stream restoration projects and as a condition of site-specific development approval in a SCA, and include monitoring to prevent reestablishment.	**Consistent.** As described in Chapter 2 Project Description, maintenance activities of the project would include restoring creek habitat by removing invasive nonnative plants and revegetating with native plants. Therefore, the project is consistent with the County's efforts to control exotic vegetation.
Policy BIO-4.7	**Protect Riparian Vegetation.** Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.	**Consistent.** The project design includes net creation of riparian vegetation and habitat in Unit 4 and Frederick Allen Park. The project is consistent with this policy.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Policy BIO-4.8	**Reclaim Damaged Portions of SCAs.** Restore damaged portions of SCAs to their natural state wherever possible, and reestablish as quickly as possible any herbaceous and woody vegetation that must be removed within an SCA, replicating the structure and species composition of indigenous native riparian vegetation.	**Consistent.** The project would involve increasing natural conditions both in the channel and adjacent to the creek by removing concrete and structures that restrict flow, obstruct fish passage, or block natural vegetation establishment. The project would create conditions that promote fish habitat and passage and restore tidal, wetland, and riparian habitat along Corte Madera Creek. Therefore, the project would be consistent with the County's reclaim damaged portions of SCAs policy.
Policy BIO-4.9	**Restore Culverted Streams**. Replace storm drains and culverts in SCAs with natural drainage and flood control channels wherever feasible. Reopening and restoring culverted reaches of natural drainages should be considered part of review of development applications on parcels containing historic natural drainages where sufficient land area is available to accommodate both the reopened drainage and project objectives. Detailed hydrologic analysis may be required to address possible erosion and flooding implications of reopening the culverted reach, and to make appropriate design recommendations. Incentives should be provided to landowners in restoring culverted, channelized, or degraded stream segments. Where culverts interfere with fish migration but replacement is not possible, modify culverts to allow unobstructed fish passage.	**Consistent.** The project would remove the existing concrete storm drains in Unit 2. New vegetated bioretention basins and bio-swales would be constructed to handle stormwater run-off. The project would be consistent with the County's restore culverted streams policy.
Policy BIO-4.15	**Reduce Wet Weather Impacts**. Ensure that development work adjacent to and potentially affecting SCAs is not done during the wet weather or when water is flowing through streams, except for emergency repairs, and that disturbed soils are stabilized and replanted, and areas where woody vegetation	**Consistent.** The project has been scheduled to allow construction only during the dry season when creek flows are at their lowest. The project is consistent with this policy.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	has been removed are replanted with suitable species before the beginning of the rainy season.	
Policy BIO-4.16	***Regulate Channel and Flow Alteration***. Allow alteration of stream channels or reduction in flow volumes only after completion of environmental review, commitment to appropriate mitigation measures, and issuance of appropriate permits by jurisdictional agencies based on determination of adequate flows necessary to protect fish habitats, water quality, riparian vegetation, natural dynamics of stream functions, groundwater recharge areas, and downstream users.	**Consistent.** Construction of the project would occur after completion of environmental review. The project is required to obtain permits and approval from various federal, state and local agencies. The anticipated permits and approvals needed for implementation of the project are identified in Section 2.8 Permits and Approvals. The District is committed to implementing mitigation measures identified in the EIR and requirements identified in appropriate permits. The project would be consistent with the County's regulate channel and flow alternation policy.
Policy BIO-4.19	**Maintain Channel Stability**. Applicants for development projects may be required to prepare a hydraulic and/or geomorphic assessment of onsite and downstream drainage ways that are affected by project area runoff. This assessment should be required where evidence that significant current or impending channel instability is present, such as documented channel bed incision, lateral erosion of banks (e.g., sloughing or landsliding), tree collapse due to streambank undermining and/or soil loss, or severe in-channel sedimentation, as determined by the County. (More details are available in Section 2.4 of the Marin Countywide Plan.)	**Consistent.** Hydraulic modeling and analysis were conducted for the project design and the model results are discussed in Section 3.9. The project is consistent with this policy.
Implementation Policy BIO-4.f	**Identify Potential Impacts to Riparian Systems.** At the time of a development application, evaluate potential impacts on riparian vegetation and aquatic habitat, and incorporate measures to protect riparian systems into the project design and construction. Retain and minimize disturbance to woody and	**Consistent.** Potential impacts to riparian vegetation and aquatic habitat and appropriate mitigation measures to reduce adverse impacts are discussed in Section 3.3. The project will result in a net increase in riparian vegetation due to increased planting of

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	herbaceous riparian vegetation in Stream Conservation Areas and adjacent areas. (Tree growth may be cleared from the stream channel where removal is essential to protect against property damage or prevent safety hazards.)	riparian vegetation in Unit 4 and Frederick Allen Park. The project is consistent with this policy.
Policy CD-2.8	**Limit Development in Resource or Hazard Areas.** Discourage development in areas with high natural resource value or threats to life or property and restrict development in such areas to minimize adverse impacts.	**Consistent.** The project will not introduce new development into the floodplain. The project would effectively provide enhanced levels of flood-risk reduction for existing developments adjacent to the creek. The project would be consistent with this policy.
Goal DES-4	**Protection of Scenic Resources.** Minimize visual impacts of development and preserve vistas of important natural features.	**Consistent.** As discussed in Section 3.1, the project would not have a substantial adverse effect on a scenic vista. The project would not block views of any scenic vista because the project features are located below grade or are low lying. The project includes landscaping and tree planting that is compatible with the natural environment and would create a natural riparian corridor and saltwater marsh areas along portions of Corte Madera Creek. The project would implement landscaping to screen new structures and would employ design features that are compatible with the existing visual context. The proposed floodwall elements in Units 2 and 3 would result in low contrast with the existing floodwall and would minimize visual impacts from the facilities due to the unity with the existing structure in the view. The project is consistent with the goal, policy and implementing programs.
Policy DES-4.1	**Preserve Visual Quality.** Protect scenic quality and views of the natural environment — including ridgelines and upland greenbelts, hillsides, water, and trees — from adverse impacts related to development	
Implementing Program DES-4.a	**Protect Key Public Views.** Work with community groups to identify, map, and protect important view corridors. Establish design standards for development in these areas as part of the design review requirements and individual community plans (see DES-3.b)	
Implementing Program DES-4.b	**Minimize Visual Impacts of Public Facilities.** Amend applicable codes and procedures to require appropriate placement, design, setbacks, and native landscaping of public facilities (including soundwalls, medians, retaining walls, power lines, and water tanks) to reduce visual impacts, and encourage local agencies to adopt similar standards.	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Goal EH-2	**Safety from Seismic and Geologic Hazards.** Protect people and property from risks associated with seismic activity and geologic conditions.	**Consistent.** Mitigation Measure 3.6-1 requires the preparation of a geotechnical investigation report by a professional geotechnical engineer to identity potential geologic hazards in the project area consistent with the implementing program. The mitigation measure also requires the report to meet performance criteria imposed by the California Building Code. The report would be incorporated into the design of the project structures to minimize seismic hazards and ensure structural safety of the proposed structures.
Policy EH-2.1	**Avoid Hazard Areas.** Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.	
Implementing Program EH-2.a	**Require Geotechnical Reports.** Continue to require any applicant for land division, master plan, development approval, or new construction in a geologic hazard area to submit a geotechnical report prepared by a State-certified Engineering Geologist or a Registered Geotechnical Engineer that: • evaluates soil, slope, and other geologic hazard conditions; • commits to appropriate and comprehensive mitigation measures sufficient to reduce risks to acceptable levels, including post-construction site monitoring, if applicable; • addresses the impact of the project on adjacent lands, and potential impacts of off-site conditions; and • meets the requirements of other agency regulations with jurisdiction in the hazard area, such as Bay Conservation and Development Commission requirements for the safety of fills consistent with the Bay Plan.	
Implementing Program EH-2.b	**Require Construction Observation and Certification.** Require any work or construction undertaken to correct slope instability or mitigate other geologic hazard conditions to be supervised and certified by a geotechnical engineer and/or an engineering geologist.	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Implementing Program EN-3.c	**Divert Construction Waste.** Continue to implement and improve the Construction and Demolition Waste Recovery Ordinance, requiring building projects to recycle or reuse a minimum of 50% of unused or leftover building materials.	**Consistent.** The demolition debris, including excavated soil and concrete generated by the project would be recycled at the Marin Resource Recovery Center. Rip-rap and excavated soil would be reused on site where feasible. Inefficient consumption of resources would be avoided through reuse of materials. The project would be consistent with the implementing program.
Policy HAR-1.1	**Preserve Historical and Archaeological Resources**. Identify archaeological and historical resource sites.	**Consistent.** As described in Section 3.4, record searches have been conducted to identify potential cultural resources in the project area. Mitigation Measure 3.4-2 defines procedures to avoid and minimize potential impacts to previously undiscovered resources including protecting resources in place, the project would avoid damaging cultural resources consistent with the policy.
Policy HAR-1.3	**Avoid Impacts to Historical and Archaeological Resources**. Ensure that human activity avoids damaging cultural resources, where feasible.	
Goal No-1	**Protection from Excessive Noise**. Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.	**Consistent.** As described in Section 3.10, project construction would occur during the allowable construction hours within each jurisdiction. Project construction activities would generate noise that would result in a temporary increase in the ambient noise level; however, the noise impacts would be temporary and noise reduction measures would be implemented as defined in Mitigation Measure 3.10-1. The project would be consistent with the goal, policy, and implementing program for noise.
Policy NO-1.3	**Regulate Noise Generating Activities**. Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.	
Implementing Program NO-1.i	**Regulate Noise Sources** - Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement the provisions of the plan.	
Policy OS-2.4	**Support Open Space Efforts Along Streams.** Support efforts to restore, enhance, and maintain natural vegetation and other habitat values along streams in the Baylands and City-Centered corridors. Maintain strict controls and high environmental standards in these zones. Targeted streams and creeks in the Baylands and City-Centered corridors includes Corte Madera Creek.	**Consistent.** The project involves improvements to the Corte Madera Creek channel, including concrete removal, riparian plantings, and fish-passage improvements, which would enhance and maintain natural vegetation and other habitat values. The project would not conflict with this policy.
Goal PFS-1	**Adequate Public Facilities and Services.** Provide basic public facilities to accommodate the level of development planned by cities and towns and the County.	**Consistent.** The project is a flood-risk reduction project that would be owned by the District. The District, a public entity, would own the pump station and flood control facilities. The facilities have been planned to reduce long-term maintenance costs. The project would provide flood risk reduction for existing development. The project would not conflict with these goal and policies.
Policy PFS-1.2	**Plan Effectively to Minimize Costs.** Plan public facilities in cooperation with service providers to minimize short- and long-term construction, operation, and maintenance costs.	
Policy PFS-1.3	**Discourage Privatization and Commercialization.** Encourage public ownership of utilities and public service facilities by not authorizing privatization of water, sewer, law enforcement, emergency service, school, and other essential services. Consider prohibiting corporate sponsorship and commercially driven naming rights of public facilities and lands as a means to fund maintenance and improvements.	
Policy PFS-1.4	**Reduce Demand on Public Facilities.** Reduce per capita and total demand for water and wastewater treatment, and enhance stormwater management through integrated and	**Consistent.** The project includes a stormwater pump station that would have a beneficial effect on the stormwater drainage system. The project would not cause permanent increase in water demand. The project would not conflict with this policy.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	cost-effective design, technology, and demand reduction standards for new development and redevelopment.	
Policy PFS-2.1	**Conserve Water and Utilize Sustainable Sources.** Promote conservation to increase the responsible use and reliability of water supplies. Reduce the waste of potable water through efficient technologies, design, and management practices, and through better matching of the source and quality of water to the user's needs.	**Consistent.** As discussed above, the project would not result in a permanent increase in water demand. Therefore, the project would not conflict with this goal.
Goal PFS-4	**Efficient Processing and Reduced Landfill Disposal of Solid Waste**. Minimize, treat, and safely process solid waste materials in a manner that protects natural resources from pollution while planning for the eventual reuse or recycling of discarded material to achieve zero waste.	**Consistent.** The demolition debris, including excavated soil and concrete generated by project construction, would be recycled at the Marin Resource Recovery Center. Rip-rap and excavated soil would be reused on site where feasible. Inefficient consumption of resources would be avoided through reuse of materials. The construction debris that can be reused will not be sent to the landfill and will be recycled or reused on other projects. Materials that cannot be recycled or reused will be sent to the Redwood Landfill and Recycling Center. The project would be consistent with the goal, policies, and implementing program.
Policy PFS-4.1	**Reduce the Solid Waste Stream.** Promote the highest and best use of discarded materials through redesign, reuse, composting, and shared producer responsibility. Emphasize a closed-loop system of production and consumption.	
Policy PFS-4.2	**Protect Environmental Health.** Require the use of waste processing and disposal techniques that prevent the contamination or other impairment of natural resources.	
Policy PFS-4.3	**Plan for Waste Transformation or Disposal.** Plan for the transformation or elimination of waste materials that cannot be reduced, recycled, or composted.	
Policy PFS-4.4	**Promote Regulatory Efforts**. Support State legislative or regulatory efforts that will aid in achieving zero waste.	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Implementing Program PFS-4.b	**Divert Construction Waste.** Continue to implement the construction and demolition recycling waste ordinance to divert construction waste from landfills.	
Goal PK-1	**A High-Quality Parks and Recreation System.** Provide park and recreation facilities and programs to meet the various needs of all county residents.	**Consistent.** The project would include construction of new and relocated recreation elements within Frederick Allen Park, including new access to the creek and relocation and realignment of Bike Route 20. Improvements also include installation of rocks, a split-rail fence to prevent encroachment into riparian habitats during the plant establishment period, and an opening in the split-rail fence that would allow for pedestrians to access the natural creek channel via an informal path. Meetings were held with the public to obtain input on the recreational design. The recreational facilities have been designed to protect the stream and riparian corridor after construction. The project would be consistent with these goal and policies.
Policy PK-1.1	**Conduct and Coordinate Park Planning.** Develop park and recreation facilities and programs to provide active recreation, passive enjoyment, and protection of natural resources as a complement to local, state, and national parks and open space in Marin County.	
Policy PK-1.2	**Consider User Needs, Impacts, and Costs.** Plan and develop any needed new park and recreation facilities and programs to meet the desires of the community and protect environmental resources.	
Policy PK-1.3	**Protect Park Resources from Impacts of Climate Change.** Identify strategies to protect park resources from the effects of climate change, such as violent weather, plant loss, or change due to moisture and temperature changes and sea level rise.	**Consistent.** Habitat created in the earthen channel area in the lower College of Marin project element would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. The project would be consistent with this policy.
Goal PS-3	**Effective Emergency and Disaster Preparedness.** Provide proper emergency and disaster preparedness services through effective and coordinated emergency management plans and procedures.	**Consistent.** As discussed in Section 3.8, the project would not affect implementation of an emergency operation plan, emergency response plan, or an emergency evacuation plan for Marin County. The project would reduce flood risk and

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Policy PS-3.1	**Plan Thoroughly for Emergencies.** Ensure that the County, its citizens, businesses, and services are prepared for effective response and recovery in the event of emergencies or disasters.	would therefore reduce the risk of flooding related emergencies. The project would not conflict with the goal or policy.
Goal PS-4	**Decreased Exposure to Hazardous Materials.** Reduce the risks to human and environmental health from hazardous materials.	**Consistent.** As discussed in Section 3.8, project activities are required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety and to reduce the potential for a release of construction-related fuels or other hazardous materials to water bodies. The project would be consistent with the goal and policy.
Policy PS-4.1	**Regulate and Reduce Hazardous Material Use.** Control the use and storage of hazardous materials to minimize their presence in, and potential dangers to, the community and environment.	
Goal TR-1	**Safe and Efficient Movement of People and Goods.** Provide a range of transportation options that meet the needs of residents, businesses, and travelers.	**Consistent.** Construction of the project would temporarily disrupt bicycle and recreational access on Bike Route 20 within Frederick Allen Park for a period of seven months. Mitigation Measure 3.13-1 requires detours for bicyclists and pedestrians to continue to provide safe bicycle and pedestrian access from Ross Commons to the College of Marin while the multi-use pathway is closed. The proposed multi-use pathway in Frederick Allen Park would continue to provide pedestrian and bicyclist transportation after construction. The project is consistent with this goal.
Goal WR-1	**Healthy Watersheds**. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.	**Consistent.** The project would improve ecological functions by removing concrete from a segment of the Corte Madera Creek channel and increasing natural water quality and biological processes within the portion of Corte Madera Creek that is

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Policy WR-1.2	**Restore and Enhance Watersheds**. Support watershed restoration efforts, coordinate County watershed activities with efforts by other groups, and simplify permit acquisition for watershed restoration and enhancement projects.	restored. The project design include channel stabilization measures to control erosion. The project would implement stormwater pollution prevention best management practices (BMPs) and would prepare a SWPPP that includes BMPs for sediment and erosion control.
Implementing Program WR-1.f	**Require Stream Restoration Projects.** Require restoration of streams in conjunction with associated land use approvals to improve groundwater recharge and filtration and to ensure high-quality water. Restoration projects should follow the design principles of natural channel restoration utilizing geomorphic concepts.	
Policy WR2.3	**Avoid Erosion and Sedimentation**. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and onsite sediment retention. Require developments to include onsite facilities for the retention of sediments and, if necessary, require continued monitoring and maintenance of these facilities upon project completion	
Implementing Program WR-2.b	**Integrate Bay Area Stormwater Management Agencies Association Stormwater Quality Protection Guidelines into Permitting Requirements for All Development and Construction Activities.** All projects should integrate stormwater pollution prevention design features for water quality protection to the extent feasible, such as those included in the Bay Area Stormwater Management Agencies Association Start-at-the-Source manual and the Tools Handbook.	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	Town of Ross General Plan	
Housing Goal	**Protect and Enhance Existing Housing, Community Character, and Resources.** Maintain the high quality of existing housing and community character, and assure energy efficiency in new and existing housing	**Consistent.** The project would provide flood protection and enhance natural creek conditions including increased riparian habitat. The reduced flood risk and increased natural creek conditions consistent with the natural creek conditions in Unit 4 in the Town of Ross would enhance the existing community character and would not conflict with this goal.
	Kentfield/Greenbrae Community Plan	
Goal 10	To the greatest extent possible, preserve the natural beauty and view corridors of the planning area. Protect and enhance environmental resources in accordance with policies of the Countywide Plan.	**Consistent.** The project would improve fish passage, natural creek processes, fish and riparian habitat adjacent to the creek, and recreational amenities along the creek corridor. The project is located in an urban area and within a confined viewshed and the proposed floodwalls would be visually consistent with the existing floodwalls. The project would not conflict with this goal.

Source: (Marin County, 2007; Kentfield Greenbrae Planning Group and Marin County Planning Department, 1987; Town of Ross, 2007)

	Significance Determination
Impact 3.16-3: The project would not result in substantial alteration of the character or functioning of the community or present or planned use of an area.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

The project would not alter the present or planned use of an area. The existing land use in the project area would remain after construction and during operation and maintenance of the project. Corte Madera Creek would continue to be used as a creek and managed for flood control and habitat. Frederick Allen Park would continue to be a park and managed for recreational use. The proposed habitat and creek improvements in the park would be compatible with the recreational use.

Construction

During construction, the project would involve temporary disturbance and permanent modifications along the Corte Madera Creek channel. The project would result in significant modifications to Frederick Allen Park, including removal of trees, removal of the concrete channel, and creation of a natural channel and riparian floodplain, and realignment of the multi-use path. Construction would involve use of heavy equipment that would produce day-time noise levels that exceed the baseline noise levels in the residential area and would temporarily alter the character of the surrounding area. Construction would last up to seven months at Frederick Allen Park, and the temporary increase in construction noise and disturbance would not result in a substantial alteration of the character of the area.

Operation and Maintenance

Immediately following construction, the project would result in exposed earth within Frederick Allen Park and a realigned pathway. The trees and associated shade contribute to the present character of Frederick Allen Park. The removal of trees, reduction in shade, and exposure of newly graded areas would result in a change to the character of the area due to the temporary reduction in urban forest. The loss of trees could reduce the feeling of privacy of residences located across from the park. The impact would be greatest prior to the establishment of vegetation and tree growth. A planting plan for Frederick Allen Park is included in Appendix B. The planting plan includes planting of some larger trees to provide greater vegetation screening immediately after construction, but there would be a temporary reduction in tree canopy for a few years while vegetation establishes. The reduction in vegetation screening from residential areas would last for a period of up to 10 years. The project would not result in removal of vegetation from private property and the existing vegetation screening on private property would remain. The impact from reduced canopy cover would be temporary and would not permanently alter the character of the community. The impact from alteration of the character of the area would be less than significant.

Mitigation: None required.

Impact 3.16-4: The project would not induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: No Impact

Construction

Project construction would occur over a period of up to seven months and would employ an average of eight to ten construction workers per day. Construction workers would likely come from within Marin County and other Bay Area counties. While it is possible that some workers might temporarily relocate from other areas, the project is not expected to result in a substantial increase in the local population. Therefore, the minimal increase in local population from the potential short-term relocation of construction workers would result in less-than-significant impacts.

Operation and Maintenance

The project includes improvements to the concrete Corte Madera Creek flood control channel, which would improve fish passage and provide increased 25-year flood-risk reduction to residents and businesses within the Town of Ross and unincorporated Kentfield. The project would not construct housing and therefore would not directly induce growth in the watershed. In addition, the reduction in flood hazard would affect areas already developed and thus would not indirectly support population growth. Operation and maintenance of the project would, therefore, not induce unplanned population growth, and there would be no impact.

Mitigation: None required.

3.16.6 References

Bay Area Census. (2020). Bay Area Census, Marin County. Retrieved July 15, 2020, from http://www.bayareacensus.ca.gov/counties/MarinCounty.htm

CAL FIRE. (2008, October 16). Marin County Very High Fire Hazard Severity Zones in LRA As Recommended By CAL FIRE.

DataUSA. (2018). *Marin County, CA*. Retrieved September 21, 2020, from https://datausa.io/profile/geo/marin-county-ca#economy

Department of Finance. (2020a). E-5 Population and Housing Estimates for Cities, Counties, and the State, 2011-2020 with 2010 Census Benchmark.

Department of Finance. (2020b). P-1 County Population Projections 2010-206.

DOC. (2019). *SMARA Statutes and Regulations*. Retrieved July 8, 2020, from California Department of Conservation Laws and Regulations: https://www.conservation.ca.gov/dmr/lawsandregulations

DOC. (2020). California Important Farmland Finder. Retrieved August 12, 2020, from https://maps.conservation.ca.gov/DLRP/CIFF/

DOC. (2020f). DOC Maps: Mines and Mineral Resources. Retrieved September 9, 2020, from https://maps.conservation.ca.gov/mineralresources/

FEMA. (2016, March 16). National Flood Hazard Layer FIRMette.

FIRESafe MARIN. (2020, July 6). *WUI - Wildland Urban Interface*. Retrieved from https://www.firesafemarin.org/wui

Kentfield Greenbrae Planning Group and Marin County Planning Department. (1987). *Kentfield/Greenbrae Community Plan.* Marin County.

Marin County . (2019). Marin County Initial Study Checklist . Marin County Community Development Agency Planning Division.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

Marin County. (2007, November 6). Marin Countywide Plan .

Marin County. (2007, November). Marin Countywide Plan Update Final EIR.

Marin County. (2020). *State Responsibility Area (Fire)*. Retrieved August 7, 2020, from https://gisopendata.marincounty.org/maps/edit?content=MarinCounty%3A%3Astate-responsibility-area-fire

Marin County Community Development Agency . (2007, November 6). Marin Countywide Plan .

Marin County Community Development Agency. (2007, November 6). Marin Countywide Plan. Retrieved July 15, 2020, from http://www.marincounty.org/depts/cd/divisions/planning/2007-marin-countywide-plan/plans-and-documents.

MarinMap. (2020). Retrieved September 9, 2020, from https://www.marinmap.org/Html5Viewer/Index.html?viewer=smmdataviewer

MTC and ABAG. (2019). Plan Bay Area 2040 Final Plan. Retrieved July 6, 2020, from http://2040.planbayarea.org/what-is-plan-bay-area-2040

RWQCB. (2017). San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan). Oakland, California .

Statistical Atlas. (2020). Kentfield, California. Retrieved September 9, 2020, from https://statisticalatlas.com/place/California/Kentfield/Population

Town of Ross. (2007). Town of Ross General Plan 2007-2025.

Town of Ross. (2020). *Municipal Code*. Retrieved July 29, 2020, from https://www.townofross.org/administration/page/municipal-code

U.S. Census Bureau. (1980). 1980 Census. Retrieved August 14, 2020, from https://www.census.gov/programs-surveys/decennial-census/decade.1980.html

U.S. Census Bureau. (1990). 1990 Census. Retrieved August 14, 2020, from https://www.census.gov/programs-surveys/decennial-census/decade.1990.html

~~U.S. Census Bureau. (2000). 2000 Census. Retrieved August 14, 2020, from https://www.census.gov/programs-surveys/decennial-census/decade.2000.html~~

~~U.S. Census Bureau. (2010). 2010 Census. Retrieved August 14, 2020, from https://www.census.gov/programs-surveys/decennial-census/decade.2010.html~~

~~U.S. Census Bureau. (2020). Population and Housing Unit Estimates Tables. Retrieved August 19, 2020, from https://www.census.gov/content/census/en/programs-surveys/popest/data/tables.2015.html/~~

University of California Cooperative Extension. (2011). Facts about Marin County Agriculture. Retrieved August 14, 2020, from https://ucanr.edu/sites/uccemarin/files/30457.pdf

US Census Bureau. (1980). 1980 Census. Retrieved July 15, 2020, from https://www.census.gov/programs-surveys/decennial-census/decade.1980.html

US Census Bureau. (1990). 1990 Census Bureau. Retrieved July 15, 2020, from https://www.census.gov/programs-surveys/decennial-census/decade.1990.html

US Census Bureau. (2019). QuickFacts Kentfield CDP, California. Retrieved July 15, 2019, from https://www.census.gov/quickfacts/fact/table/kentfieldcdpcalifornia/PST045219#PST045219

USACE. (2018, October). Draft Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) of the Corte Madera Creek Flood Risk Management Project.

4 Growth-Inducing and Cumulative Effects

4.1 Growth Inducement Potential and Secondary Effects of Growth

Section 15126.2(e) of the California Environmental Quality Act (CEQA) Guidelines requires that an Environmental Impact Report (EIR) discuss "the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment."

The Corte Madera Creek Flood Risk Management Project, Phase 1 (project) would not involve any housing construction and therefore would not induce growth directly by constructing housing that would attract people to the area. Project construction would not extend roads or other infrastructure that could indirectly induce growth. Given the size and availability of the regional workforce, project construction would not be expected to induce demand for housing by attracting a substantial number of workers from outside the region. Nor would the project provide new permanent employment opportunities that could attract workers to the area; long-term operation of the project would not increase the number of workers employed by the District.

In some cases, a flood-risk reduction project can remove an obstacle to growth. However, in this case, the project would reduce flood risk in existing developed areas. The project would primarily result in reduced flood risk for 10- and 25-year flood events. The 100-year floodplain would remain similar to existing conditions. Because planning restrictions are focused around the 100-year floodplain, the project would not remove a barrier to development but would improve flood protection in previously developed areas. The project would not allow additional growth to occur nor would it change the locations where this growth is planned to occur. Consequently, implementation of the project would not affect current and/or projected population growth patterns within Marin County and, therefore, would not have a growth-inducing impact.

4.2 Significant Irreversible Changes

Sections 15126(c) and 15126.2(d) of the CEQA Guidelines require a discussion of the significant irreversible environmental changes of a project.

Irreversible commitments of resources are those which cause either direct or indirect use of natural resources such that the resources cannot be restored or returned to their original condition. Construction activities associated with the project would result in an irretrievable and irreversible commitment of natural resources through direct consumption of fossil fuels and use of materials. Construction would include the short-term use of electricity and refined petroleum products during the operation of construction equipment (primarily gas, diesel, and motor oil). The energy consumption for construction would not result in substantial depletion of non-renewable energy resources and would not permanently increase reliance on energy resources that are not renewable. Construction activities would not reduce or interrupt existing electrical or natural gas services such that existing supplies would be constrained.

Project operations that would affect irretrievable resources would be limited to annual maintenance activities. Project maintenance would involve activities similar to maintenance of the existing flood control channel. Maintenance activities would result in irreversible and irretrievable use of energy and material resources from annual testing and emergency use of the stormwater pump station generator, use of electricity to power the stormwater pump station during storms, and use of diesel fuel and oil for maintenance vehicles and equipment. The commitment of non-renewable resources usage would be minor, and therefore, would not be significant.

The use of the nonrenewable resources would not affect the availability of these resources for other needs within the region. Additional information regarding irreversible changes or resource use is discussed in Section 3.5 Energy.

4.3 Cumulative Impacts

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of each project when added to those of other closely related past, present, or probable future projects. Section 15130 of the CEQA Guidelines provides the following pertinent guidance for cumulative impact analysis:

1. An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (defined by CEQA Guidelines section 15065(e)(3) as the incremental effects of an individual project are considerable when viewed in connection with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
2. An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
3. A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

4. The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.
5. The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

CEQA Guidelines Section 15130(b)(1) provides two approaches to a cumulative impact analysis; the analysis can be based on (a) a list of past, present, and probable future projects producing related or cumulative impacts; or (b) a summary of projections contained in a general plan or related planning document.

Cumulative impact analysis considers the effects of the project together with those of other past, present, or probable future projects. The cumulative considerations and impacts for each section are summarized below. Each analysis of cumulative impacts is based on the same setting, regulatory framework, and significance criteria as the project-specific analysis. Additional mitigation measures are identified if the cumulative analysis determines that a significant cumulative impact could occur and the project's contribution to a significant cumulative impact would be considerable, even with project-level mitigation.

As provided for in CEQA Guidelines Section 15130(b)(1), the analysis in this EIR employs the list-based approach for defining projects to be considered in the cumulative impact analysis — that is, the analysis is based on a list of past, present, and probable future projects that could result in related or cumulative impacts. The probable future projects are subject to independent environmental review and consideration by approving agencies. Consequently, it is possible that some of the projects will not be approved or will be modified prior to approval (e.g., as a result of the CEQA process).

Projects that are relevant to the cumulative analysis include those that could have incremental effects on the same environmental resources and would have similar environmental impacts as those identified for the project in this EIR. The following factors were used to determine an appropriate list of relevant projects to be considered in the cumulative analyses:

1. **Similar Environmental Impacts.** Whether a project contributes to effects on the same environmental resources that are also affected by the project and would have similar or related environmental impacts as those discussed in this EIR (Sections 3.1 through 3.17).
2. **Geographic Scope of the Area Affected and Location.** Whether a project is located within the defined geographic scope for the cumulative effect. The geographic scope of cumulative projects depends on the resource affected and is identified within each section of the EIR. The geographic scope generally coincides with the physical environment described in the setting and could include the areas adjacent to the proposed construction. For some potential impacts, however, the geographic scope would extend farther, such as for the discussion of traffic in which the regional roadway network is relevant, or the

evaluation of air quality effects in which the regional air basin is the appropriate geographic scope for the analysis.

3. **Timing and Duration of Implementation.** Whether the schedule of activities for a relevant project would need to coincide in timing with the effects of the project to result in cumulative impacts. For temporary impacts such as noise and traffic, the cumulative analyses consider the short-term cumulative effects of those projects with overlapping construction schedules as well as the long-term cumulative effects of those projects that would be in operation concurrently with the project and would affect the same environmental resources.

Table 4.3-1 describes the past, present, and probable future projects that are considered in the cumulative analyses (based on the factors described above), and their locations are shown on Figure 4.3-1. The list includes projects that have overlapping construction schedules with the project (or would be completed prior to or following project construction) and that would be constructed in the general vicinity of the project elements. The list also includes projects that would be in operation concurrently with the project.

The cumulative analyses presented below first consider whether there is an impact of the project that could result in adverse physical effects on the environment. If so, the cumulative analysis considers whether any of the projects listed in Table 4.3-1 would result in related impacts or affect the same environmental resources as the project, resulting in a cumulative impact. If the cumulative impact is considered significant based on the identified significance criteria, the analysis next considers whether the project's contribution would be cumulatively considerable, and therefore significant. If the project's contribution would be cumulatively considerable, mitigation measures are identified to reduce the project's contribution to a less-than-significant level. If there is no feasible mitigation to reduce the project's contribution to a less-than-significant level, the project's contribution to the cumulative impact is considered significant and unavoidable.

Table 4.3-1 Projects Considered in Cumulative Impact Analysis

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
1	Access Ramp to the Corte Madera Creek Flood Control Channel	The project would involve construction of a new permanent concrete access ramp. The ramp would be constructed within the District's property at the intersection of Locust Avenue and Cedar Avenue and would provide vehicular and equipment access into the Corte Madera Creek flood control channel. The access ramp would be approximately 15 feet wide, 70 feet long, and sloping from Cedar Avenue down to the existing channel at an approximately 15-percent grade. A 6-foot-high flood gate would be installed across the ramp near where the ramp meets Cedar Avenue.	Project planning	• Construction completion scheduled in summer 2021.
2	Meadow Way Bridge (Town of Fairfax)	The Meadow Way Bridge has a low Sufficiency Rating of 44.1 out of 100 and has been designated as "functionally obsolete" by Caltrans. The Town of Fairfax proposes to replace the old bridge with a single-span concrete-arch replacement bridge. The replacement bridge would allow safe passage for both automobiles and pedestrians. The proposed replacement bridge would also include raised reflective pavement markers at proper intervals to alert the drivers and pedestrians of the two separate travel zones. The replacement bridge would comply with federal and state design codes and weight limits.	The CEQA document was adopted on June 3, 2020, by the Town of Fairfax Council.	• Construction is anticipated to begin and complete in 2020.
3 and 4	San Anselmo Flood Risk Reduction Project (Marin County Flood Control & Water Conservation District)	The project is part of the District's 10-Year work plan to mitigate the 25-year flood event in the Ross Valley. The project consists of three District components: 1) the Sunnyside Nursery Flood Diversion and Storage Basin at 3000 Sir Francis Drake Boulevard; 2) the removal of buildings at 632–634 San Anselmo Ave in San Anselmo (Building Bridge #2), a structure that partially obstructs the flow of San Anselmo Creek and related creek restoration; and 3) flood mitigation measures on three	The contract to perform the final phase of design work was approved by the District Board of Supervisors on March 31, 2020.	• Preliminary excavation of the Sunnyside Nursery basin started in September 2020. • The San Anselmo building demolition work was conducted in May 2020.

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
		downstream private properties that may see a rise in water surface due to the removal of BB2 in San Anselmo.		• The creek related work at both sites are anticipated to begin in Summer 2021.
5	Hillview Pump Station and Stormdrain Improvements (Marin County Flood Control & Water Conservation District)	The City of Larkspur is seeking alternatives to the maintenance-intensive need to perform sediment removal in Corte Madera Creek at storm-drainage outfalls in Hillview Gardens. The project would involve reconfiguring of the storm-drain system in the Hillview Garden neighborhood and rerouting to a new storm drain pump station on Bon Air Road.	The project is currently undergoing feasibility phase under a cost-share agreement between the District and City of Larkspur.	• Construction and future planning are pending on the result of the feasibility study and the timing is unknown.
6	Winship Bridge Replacement Project (Town of Ross)	The project involves replacing the existing Winship Avenue Bridge with a new bridge that is designed to meet current roadway and sidewalk design standards and improve conveyance capacity within San Anselmo Creek by eliminating the arches and center bridge pier in the waterway, widening the opening and raising the elevation of the bridge deck. Other project features would include new curb, gutter, sidewalk, and accessible ramps between Sir Francis Drake Boulevard and Winship Avenue intersections.	The project IS/MND was approved in March 2020	• Construction is scheduled to begin in 2022.
7	375 Crown Road LLC Design Review (P2028) (Marin County Community Development Agency)	This project would include construction of 1,762 square feet of additions to a residence on a developed lot in Kentfield. The proposed development would also include remodeling of a pool and deck remodel with a height of 10 feet above surrounding grade and outward facing walls over 4 feet.	Application in review	• Uncertain
8	Adamson Variance (P2796) (Marin County Community Development Agency)	The applicant proposes to construct a new 390-square-foot addition onto an existing residence in Kentfield.	Approved	• Uncertain

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
9	Allbin Design Review and Accessory Dwelling Unit (P2856)	The applicant proposes to tear down an existing garage and is requesting Design Review and Accessory Dwelling Unit Permit approval to construct a new two-story structure on a developed lot in Kentfield.	Application in review	• Uncertain
10	Brewer Design Review (P2827) (Marin County Community Development Agency)	The applicant proposes to construct a new second-story 300-square-foot addition onto an existing residence in Kentfield.	Application filed	• Uncertain
11	Cedar Tentative Map (P2801) (Marin County Community Development Agency)	The applicant proposes to divide the site into two parcels, retaining the existing home and work shed on Parcel 1 at 8,483 square feet. The remaining portion will become Parcel 2 and will be 6,886 square feet, to include the existing garage.	Application in review	• N/A
12	Brownridge Design Review/Tree Removal (P2780) (Marin County Community Development Agency)	The applicant proposes to tear down an existing residence on a developed lot, rendering the lot vacant, to construct a new 4,694-square-foot residence with a 540-square-foot attached garage and to remodel an existing guest house. Various site improvements proposed by the applicant include installation of a new pool and landscaping.	Application in review	• Uncertain
13	Christensen Design Review (P2820) (Marin County Community Development Agency)	The applicant proposes to remodel and expand an existing residence on a 27,009-square-foot lot in Kentfield. The existing 4,735-square-foot residence would be enlarged by 990 square feet. Additionally, the applicant proposes the construction of a 408 -square-foot accessory structure.	Application filed	• Uncertain
14	Cooney Design Review/Tree Removal (P2390) (Marin County	The applicant proposes to construct a new 8,576-square-foot single-family residence on a vacant lot in the community of Kentfield. The project includes a proposal to remove two trees classified as “Protected” per Section	Application in review	• Uncertain

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
	Community Development Agency)	22.130.030 of the Marin County Development Code to accommodate construction of the residence and associated site improvements.		
15	Morgan Design Review (P2808) (Marin County Community Development Agency)	The applicant proposes to remodel and expand an existing residence on an approximately 21,000-square-foot developed lot in Kentfield.	Application filed	• Uncertain
16	Marin Healthcare District Design Review (P2787) (Marin County Community Development Agency)	The Marin Health Care District proposes to construct a new five-story, 100,000-square-foot Ambulatory Services Building (ASB) with ground level footprint totaling approximately 20,000 square feet; a new six-story parking structure with ground-level footprint totaling approximately 20,000 square feet, which would be constructed adjacent to the existing parking structure on an existing surface parking lot; and a pedestrian bridge which would connect the existing and proposed parking structures with the new proposed ASB. Other improvements would also be entailed in this project, including the following: site grading to accommodate the new parking structure and ASB; tree removal and planting; on- and off-site landscaping; lighting, wayfinding and identification signs; and roof of the garage structure consisting of solar.	Application in review	• Uncertain
17	Swanson Design Review (P2838) (Marin County Community Development Agency)	The applicant is proposing to construct a new, second-story (above a detached garage), 483-square-foot ADU on a developed lot in Kentfield.	Application in review	• Uncertain
18	Marin Healthcare District Design Review/Sign Review (P2192) (Marin	The Marin Healthcare District proposes to construct the next phase of Marin General Hospital redevelopment project. This phase of construction involves renovation of the existing West Wing building and construction of an	Application in review	• Uncertain

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
	County Community Development Agency)	attached, one-story 3,500-square-foot addition. The new construction, along with the renovation, would create a new primary hospital entry, lobby, waiting area, admitting area, café and other associated uses. Other improvements would also be included in this phase, including the following: tree removal and planting, on- and off-site landscaping, lighting, wayfinding and identification signs, midblock pedestrian walkway, relocation of a bus stop, new pedestrian and vehicle entrances, and a pick-up/drop-off circular turnaround as well as off-site improvements to Bon Air Road to create a left-turn pocket into the new vehicular entrance.		
19	Nelson Design Review (P2738) (Marin County Community Development Agency)	The applicant is proposing to construct three new additions totaling 149 square feet onto an existing residence in Kent Woodlands. Various site improvements would also be entailed in the proposed development, including removal of a detached accessory structure.	Approved	• Uncertain
20	Real Equity Tree Removal (P2622) (Marin County Community Development Agency)	The applicant is proposing to remove one heritage redwood tree to accommodate a fire truck turnaround on a lot in unincorporated Kentfield currently undergoing construction.	Approved	• The project is currently under construction.
21	Lower Corte Madera Creek Improvement Study (Marin County Flood Control & Water Conservation District)	The Lower Corte Madera Creek Improvement Study will provide a comprehensive assessment of the current condition of the levee and creek system downstream of the concrete channel and identify and provide recommendations for improvements. The Study is funded by a grant the District received under the Local Levee Assistance Program (LLAP) from the California Department of Water Resources (DWR) that will provide 55% reimbursement of costs for both past and future work covered under the grant. The Study is intended to assess the need for future projects and consider potential	The Study reports were completed in 2019.	• The schedule for the project construction is difficult to estimate because it is dependent upon obtaining grant funding.

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
		project concepts that could be partially funded for final design and construction under the LLAP or from other funding sources.		
22	Lower Sleepy Hollow Creek Improvements (Marin County Flood Control & Water Conservation District)	The Lower Sleepy Hollow Creek Improvements Project is a portion of the Ross Valley Flood Protection & Water Program. Most creek improvements are proposed along Sleepy Hollow Creek from Broadmoor Avenue Bridge down to the Taylor Street Bridge. The goal of all the improvements is to create additional creek-flow capacity. Improvements include bridge replacements, retaining-wall replacements, bank stabilization, building relocation or removal, creek-channel enlargement, concrete removal from the creek bed, and flood barriers along the top of the creek bank.	As of July 2016, Stetson Engineers is working on the Feasibility Study for the project.	• The schedule for the project construction is difficult to estimate because it is dependent upon obtaining grant funding.
23	Corte Madera Creek Project Phase II (Friends of Corte Madera Creek Watershed)	Corte Madera Creek Project Phase II would include removal of the existing concrete channel from College Avenue to Stadium Way along College of Marin property. The channel bed would be in natural substrate. The right bank would be laid back to create a natural creek slope. The left bank would remain with either an existing concrete wall, a new shorter wall, or large rock embankment to protect an existing Ross Valley Sanitation District owned sewer pipeline that runs parallel to the concrete channel left bank. In addition, the proposed project would relocate Bike Route 20 from the right bank to the left bank of the creek.	Project planning	• Not currently scheduled. Engineering and environmental for Phase 2 will begin after completion of Phase I.
24	Sir Francis Drake Boulevard Rehabilitation Project (Marin County Department of Public Works)	The project consists of various physical modifications to Sir Francis Drake Boulevard, including repaving, pedestrian/cyclist safety improvements, striping, intersection and signal improvements, traffic operation improvements, utility infrastructure improvement, and new street lighting.	In construction	• June 2020 – Construction began at the center of the project area. Construction has started in the western and eastern segments of the project.

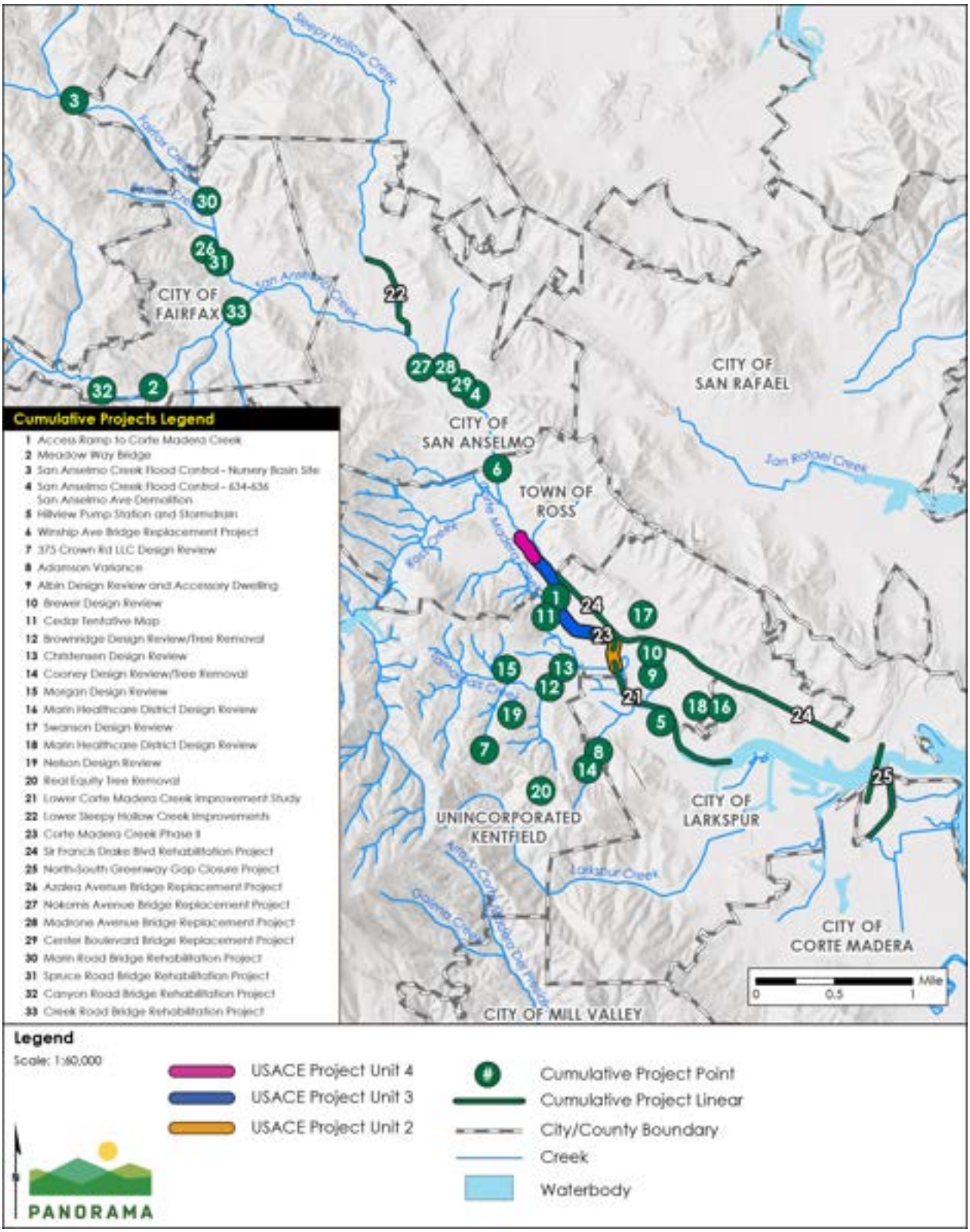
Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
				• December 2021– Construction is anticipated to be completed.
25	North-South Greenway Gap Closure Project (California Department of Transportation and Transportation Authority of Marin)	The project will close a key gap in the local and regional non-motorized transportation network between the Central Marin Ferry Connector Bridge (CMFC) and the existing multi-use paths at the intersection of Old Redwood Highway and Wornum Drive. The project includes two segments, the Northern Segment and the Southern Segment. The Northern Segment includes replacing the existing narrow sidewalk along the U.S. Highway 101 northbound off-ramp with a wider multi-use pathway and adding a multi-use pathway along a portion of Old Redwood Highway. The Southern Segment includes the area between Corte Madera Creek and Wornum Drive.	The planning, environmental review, and final design process is underway for the Northern Segment. The Southern Segment has been suspended for financial reasons pending identifications of additional funding.	• Northern Segment – construction is anticipated to begin in early 2021 and complete in mid-2022. Pathway closures during construction would be limited to nighttime hours. • Southern Segment – construction schedule is difficult to estimate because it is dependent upon obtaining grant funding.
26	Azalea Avenue Bridge Replacement Project	The proposed bridge replacement project at Azalea Avenue in the Town of Fairfax will remove and replace the existing bridge over Fairfax Creek. The existing bridge configuration restricts flow in the creek and causes water to back up and overtop creek banks during large flood events. By enlarging the bridge opening, Fairfax Creek will have increased flow capacity, which will reduce the risk of flooding in the Fairfax area.	The project is currently in planning.	• Construction has not been scheduled, but could begin as early as 2022.
27	Nokomis Avenue Bridge Replacement Project	The Town of San Anselmo is planning to replace the Nokomis Ave. bridge over San Anselmo Creek, which is functionally obsolete. The replacement bridge will be designed to pass a 100-year storm event within the channel. In addition to the bridge being replaced, there will be temporary in-channel work required to remove the	The project is in planning with Caltrans and the Town of San Anselmo	• The timing of construction is difficult to estimate because the project is in design and planning and requires CEQA compliance and permits. Construction is

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
		existing bridge piers, abutments, excavate for the proposed bridge foundations, and relocate some utilities.		anticipated to occur within 5 years.
28	Madrone Avenue Bridge Replacement Project	The Town of San Anselmo is planning to replace the Madrone Ave. bridge over San Anselmo Creek, which is functionally obsolete. The bridge design will need to be consistent with the existing roadway classification and the Town's complete streets policy. The bridge would be replaced with a similar two-lane bridge that will be wider to accommodate vehicles, bicyclists, and pedestrians with standard traffic lanes, shoulders, and ADA compliant sidewalks. Design changes will be considered to improve safety for all roadway users and alleviate congestion at the nearby intersections of Center Boulevard with San Anselmo Avenue/Sycamore Avenue and Bridge Avenue. The bridge will also be designed to pass a 100-year storm event within the channel.	The project is in planning with Caltrans and the Town of San Anselmo	• The timing of construction is difficult to estimate because the project is in design and planning and requires CEQA compliance and permits. Construction is anticipated to occur within 5 years.
29	Center Boulevard Bridge Replacement Project	The Town of San Anselmo is planning to replace the bridge over San Anselmo Creek, which is functionally obsolete. All design alternatives will focus on replacement of the existing bridge with a similar two-lane bridge that will be wider to accommodate vehicles, bicyclists, and pedestrians with standard traffic lanes, shoulders, and ADA compliant sidewalks. Design changes will be considered to improve safety for all roadway users and alleviate congestion at the nearby intersections of Center Boulevard with San Anselmo Avenue/Sycamore Avenue and Bridge Avenue. The bridge will also be designed to pass a 100-year storm event within the channel. In addition to the bridge being replaced, there will be temporary in-channel work required to remove the existing bridge piers, abutments,	The project is in planning with Caltrans and the Town of San Anselmo	• The timing of construction is difficult to estimate because the project is in design and planning and requires CEQA compliance and permits. Construction is anticipated to occur within 5 years.

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
		excavate for the proposed bridge foundation and relocate some utilities		
30, 31, 32, and 33	Marin Road, Spruce Road, Canyon Road, and Creek Road Bridge Rehabilitation	The Town of Fairfax is planning upgrades to four bridges which span San Anselmo and Fairfax Creeks on Marin Road, Spruce Road, and Canyon Road. Major upgrades may require seismic retrofits to address structural issues.	The projects are in early planning and require design and environmental review.	• The construction schedule cannot be determined due to limited information on the design and environmental review process.
34	Learning Resources Center Project (College of Marin)	The project would construct a three-story, 77,000-square-foot replacement facility on the site of the existing building, to address seismic safety and provide upgraded facilities. The associated work would be limited to within the footprint of the existing building, and no alterations would occur to the adjacent pedestrian bridge.	The project currently is under construction.	• The construction would take approximately 12 months.

Sources: (Marin County DPW, 2020; Town of Fairfax, 2020; The District, 2020; The District, 2019; Marin County Community Development Agency, 2020; The District, 2018; The District, 2015a; The District, 2015b; Simonitch, 2020; Houston, 2020) (Larkspur & Corte Madera, 2020)

Figure 4.3-1 Cumulative Projects Locations



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, US Geological Survey 2013)

4.4 Cumulative Impact Analysis

The following subsections include a discussion of cumulative impacts by resource topic and, where appropriate, a description of the mitigation measures that would avoid or lessen the project's contribution to a significant cumulative impact. Pursuant to CEQA Guidelines Section 15130(a)(1), an EIR should not discuss impacts that do not result in part from the project evaluated in the EIR. The cumulative impact analysis includes only those impacts that would result from project implementation of the project. The project would have no impact on the following resource topics and would, therefore, not contribute to cumulative impacts on the following:

- Agricultural and forestry resources
- Mineral resources
- Population and housing
- Wildfire
- Socioeconomics

4.4.1 Aesthetics and Visual Resources

Geographic Scope

The geographic scope for the analysis of potential cumulative aesthetic impacts includes the project area and project vicinity within publicly accessible viewsheds of the project, as described in Section 3.1 Aesthetics and Visual Resources. The project viewshed is limited to those areas in close proximity to the project due to the surrounding development and lower elevation of the Corte Madera Creek flood control channel.

Cumulative Projects

Concurrent construction of the project with cumulative projects proposed within the same viewsheds could result in visual impacts during construction. Projects located within the same viewshed as the proposed project include the access ramp to Corte Madera Creek (#1), Lower Corte Madera Creek Improvement Study (#21), ~~and~~ Corte Madera Creek Project Phase II (#23), and the Learning Resources Center Project (#34). All other cumulative projects that would be constructed concurrently with the proposed project are located at a distance from the project and are not located within the same viewshed as the proposed project. There would be no cumulative construction or operational aesthetic impacts with projects that are located outside of the project viewshed.

Cumulative Impact

Impacts Avoided

The project would not result in cumulative impacts from new sources of lighting or glare or impacts on scenic highways.

Scenic Vistas

The proposed project and cumulative projects are not located within a designated scenic vista, but the project and cumulative projects are located within the viewshed of ridgelines along that

include scenic vistas. Due to the limited area of new land disturbance and changes proposed at a distance from any scenic vista, the cumulative impact on scenic vistas would be less than significant.

Visual Quality

The access ramp to Corte Madera Creek would be constructed prior to the proposed project and would be located in proximity to the floodwall. The access ramp would be a small structure that would appear similar to the existing floodwall. As discussed in Section 3.1, the proposed increase in floodwall height would also appear similar to the existing floodwall. The cumulative impact from addition of the floodwall and access ramp would be less than significant. The Corte Madera Creek Project Phase II project and Lower Corte Madera Creek Improvement Study project have not been designed, and the aesthetic impacts of these projects cannot be fully determined. The Corte Madera Creek Project Phase II and Lower Corte Madera Creek Improvement Study would be located near the lower College of Marin concrete channel removal project. Additional removal of the concrete channel and flood-control improvements to areas downstream of the concrete channel would appear consistent with the proposed concrete -channel removal and would result in a beneficial aesthetic impact. The Learning Resources Center Project would be constructed before the proposed project and would be in proximity to the floodwall. The new Learning Resources Center would be three stories in height and would appear similar to the existing two-story building at the project site and within the overall context of the college. The proposed increase in floodwall height also would appear similar to the existing floodwall; therefore, the cumulative aesthetic impact from addition of the floodwall and Learning Resource Center would be less than significant. ~~The cumulative aesthetic impact would be less than significant.~~

4.4.2 Air Quality

Geographic Scope

The geographic scope for criteria air pollutants is the San Francisco Bay Air Basin because regional air pollution is cumulative by nature within the air basin. The geographic scope for TACs includes projects within 1,000 feet of the project area because of the limited TACs generated by the project and because TACs would disperse at distances greater than 1,000 feet.

Cumulative Projects

Criteria Air Pollutants

The analysis of criteria pollutants assumes all projects that would be implemented within the air basin and the existing exceedance of the air quality standards. No single project by itself would be sufficient in size to result in regional non-attainment of ambient air quality standards. The project-level thresholds for criteria air pollutants set by Bay Area Air Quality Management District (BAAQMD) are based on levels by which new sources are not anticipated to contribute to an air quality violation or result in a cumulatively considerable net increase in criteria air pollutants. Therefore, if a project would exceed the identified construction or operational significance thresholds, its emissions would be cumulatively considerable, and if a project

would not exceed the construction or operational significance thresholds, its emissions would not be cumulatively considerable.

Toxic Air Contaminants

The only cumulative projects proposed within 1,000 feet of the proposed project include the Access Ramp to Corte Madera Creek (#1), the Cedar Tentative Map (#11), the Corte Madera Creek Project Phase II (#23), and the Sir Francis Drake Boulevard Rehabilitation (#24), and the Learning Resources Center Project (#34).

Cumulative Impacts

Criteria Air Pollutants

As discussed in Section 3.2 Air Quality, the San Francisco Bay Air Basin is in nonattainment for ozone, PM_{10}, and $PM_{2.5}$. The regional nonattainment status reflects a significant cumulative air quality impact. As discussed in Section 3.2, neither construction nor operation of the project would exceed the criteria air-pollutant thresholds set by BAAQMD. The criteria air-pollutant thresholds were set by BAAQMD to address the significant cumulative impact. The project's contribution to the cumulative air quality impact would be less than considerable and therefore less than significant.

Toxic Air Contaminants

The cumulative projects and the proposed project would generate toxic air contaminants (TACs) during construction and operation. The proposed project would include a new generator, but the generator would only be used up to 50 hours per year and would not be a considerable source of TACs. Construction of the Learning Resources Center Project would be completed before the proposed project and would not contribute to cumulative TACs because it would not generate TACs during the same time frame as the proposed project's construction. The Access Ramp to Corte Madera Creek and Sir Francis Drake Boulevard Rehabilitation would be constructed a year prior to the proposed project. The Corte Madera Creek Project Phase II would be constructed several years after the proposed project because planning, engineering, and funding are still required for the project. None of the cumulative projects would generate TACs at the same time as the proposed project because the construction schedules for the cumulative projects and proposed project do not overlap.

There are five existing permitted sources within 1,000 feet of the project site. The major arterial roads (i.e., Sir Francis Drake Boulevard) in the project vicinity could contribute additional risk; however, this would be small since the road does not have a substantial amount of truck traffic in this area and adequate information on annual average traffic counts and percentage of trucks is not readily available. The HRA prepared for the project (Appendix C) includes analysis of cumulative TACs to address the existing sources and the proposed project. The quantitative analysis of TACs provided in Table 4.4-1 demonstrates that the cumulative impact would not exceed BAAQMD thresholds and would be less than significant.

Table 4.4-1 Estimated Cumulative Health Risk at the Maximally Exposed Individual Receptor

Source	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Construction			
Existing permitted stationary sources [a]	13.0	0.026	0.26
Unmitigated project construction [b]	16.5	0.039	0.12
Total cumulative construction health risk	29.5	0.065	0.38
BAAQMD significance thresholds	100.0	10.0	0.80
Threshold exceeded?	No	No	No
Operations			
Existing permitted stationary sources [a]	13.0	0.026	0.26
Unmitigated project operations [b]	0.76	0.0002	0.001
Total cumulative operational health risk	13.77	0.026	0.256
BAAQMD significance thresholds	100.0	10.0	0.80
Threshold exceeded?	No	No	No

Notes:

[a] Permitted sources include generators and gas stations. The BAAQMD Distance Multiplier Tool went to 280 meters for generators, 300 meters for gas stations, and 300 meters for other sources. The health-risk values presented are adjusted to the maximally exposed individual receptor to the proposed project.

[b] This receptor location is the location where the maximum health risk would occur based on modeling. No real-world sensitive receptor occurs at this location.

4.4.3 Biological Resources

Geographic Scope

The geographic scope for the analysis of potential cumulative biologic impacts includes the Corte Madera Creek watershed.

Cumulative Projects

Direct cumulative impacts could occur if any projects within the vicinity of the project would be constructed at the same time as the proposed project. Of the projects presented in Table 4.3-1, only construction of the Winship Avenue Bridge Replacement Project could occur concurrently with the project. Indirect cumulative impacts could occur from habitat impacts within the

watershed. The majority of the proposed projects in Table 4.3-1 include some degree of temporary or permanent habitat impacts and are therefore considered in this analysis.

Cumulative Impacts

Impacts Avoided
No Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) have been approved in the project area or vicinity. No significant impacts from conflicts with an HCP or NCCP would occur.

Special-Status Species
A direct cumulative impact on special-status species would occur if the proposed project and cumulative project impacted the same special-status species. The proposed project and cumulative projects would only cause direct impacts on special-status species during construction. The only cumulative project that would be constructed at the same time as the proposed project is the Winship Avenue Bridge Replacement Project. The Winship Avenue Bridge Replacement Project is located approximately 2,000 feet north of the upstream end of Unit 4. The Winship Avenue Bridge Replacement Project is located on Corte Madera Creek and could impact the same aquatic and terrestrial special-status species as the proposed project in Unit 4. The Winship Avenue Bridge Replacement Project includes mitigation measures that require species pre-construction surveys, environmental awareness training, biological monitoring, fish rescue plan, water diversion and dewatering, steelhead critical habitat and Essential Fish Habitat (EFH) protection, and nesting bird protection. Because the Winship Avenue Bridge Replacement Project construction would be short-term and the impacts would be isolated to the bridge placement area, and the project includes mitigation measures to avoid impacts on special-status species, the potential cumulative impact on special-status species would be less than significant.

Riparian Habitat, Sensitive Natural Communities, and Wetlands
The Meadow Way Bridge (#2), San Anselmo Creek Flood Control – Nursery Basin Site (#3), Winship Avenue Bridge Replacement (#5), Lower Corte Madera Creek Improvement Study (#21), Lower Sleepy Hollow Improvements (#22), and Corte Madera Creek Project Phase II (#23) involve improvements to the creek and would be expected to impact riparian habitats, sensitive natural communities, and wetlands/waters, which also occur within the proposed project area. Each of the cumulative projects would involve long-term benefits to habitat, but construction would include temporary impacts on vegetation communities and habitat. The temporal impact on riparian habitat and sensitive natural communities for the cumulative projects could overlap because of the time needed for vegetation establishment and habitat restoration. The cumulative temporal impact on riparian habitats and sensitive natural communities is significant.

The project would temporarily impact 0.55 acre of riparian habitat and entail 1.56 acres of impact on brackish marsh during construction. The proposed project would also remove oak trees and impact stream and intertidal habitat within the concrete flood control channel. The proposed project would involve a considerable contribution to the temporal impact on riparian

areas, wetlands, and sensitive vegetation communities. The District would implement Mitigation Measure 3.3-1a, 3.3-2a, and 3.3-2b. Mitigation Measure 3.3-1a requires avoidance of sensitive natural communities or compensatory mitigation for any communities that cannot be avoided. Mitigation Measure 3.3-2a requires monitoring and management of the riparian and wetland habitats created by the project to ensure the created habitat is successful and compensates for temporary impacts. Mitigation Measure 3.3-2b requires replacement planting of removed trees, including replacement for oak trees at a minimum ratio of 4:1. The mitigation measures would avoid loss of sensitive natural communities and ensure successful restoration of riparian areas resulting in increased riparian and oak woodland habitat and sensitive natural communities after construction. Therefore, the project's contribution to a significant cumulative impact would be less than considerable after mitigation.

Conflict with Policies Protecting Biological Resources

The cumulative projects are each required to comply with local policies and ordinances for the protection of biological resources. All cumulative projects would need to obtain a tree removal permit for any applicable tree removal. There would be no cumulative conflict with policies and ordinances for the protection of biological resources.

Invasive Species

The proposed project and cumulative projects located on Corte Madera Creek could introduce invasive aquatic and terrestrial species to the area or transport materials to other areas through weeds or eggs on construction equipment or worker boots/waders. The cumulative impact from introduction and spread of invasive species and pathogens is potentially significant. The proposed project could contribute considerably to the cumulative impact because the proposed project would introduce construction equipment to the creek and could introduce new weeds or aquatic invasive species to the areas of temporary impact or transport aquatic invasive species to other areas. The District would implement Mitigation Measures 3.3-1e and 3.3-1g to avoid introduction or transfer of invasive species. Mitigation Measure 3.3-1e would avoid or minimize significant impacts from invasive species by requiring washing of vehicles and specific requirements to prevent introduction of pathogens and invasive plant species. Mitigation Measure 3.3-1g would avoid significant impact from invasive aquatic species through defining specific requirements to ensure construction equipment and materials are free of invasive aquatic species. These mitigation measures would prevent introduction of pathogens and invasive plant species to Corte Madera Creek and the surrounding area. Because the mitigation would avoid introduction of invasive species into the area, the project's contribution to the potentially significant cumulative impact would be less than significant with mitigation.

4.4.4 Cultural Resources and Tribal Cultural Resources

Geographic Scope

Impacts related to cultural resources are generally site-specific, and they depend on the specific localized resources affected and their potential to be found in the area. They are not typically additive or cumulative in nature. The project is not located within a historic district. There is no

indication that the project area has been used for human burial purpose, and no significant archaeological resources are known to exist within the project area.

Cumulative Projects

All identified current and reasonably foreseeable future projects in Table 4.3-1 that are within or in close proximity to the project area that involve ground disturbance have the potential to combine with the impacts of the project to result in cumulative impacts to unknown buried archaeological resources and human remains should they occur in the area. The only cumulative projects located close enough to the proposed project to result in cumulative impacts on cultural resources are the Access Ramp to Corte Madera Creek (#1)~~, and~~ Corte Madera Creek Project Phase II (#23), and the Learning Resources Center Project (#34). The remaining projects are separated from the project by a considerable distance, with intervening developed areas.

Cumulative Impacts

Impacts Avoided

The project would not affect any eligible historic built resources. The project would not contribute to significant impacts on historic architectural resources.

Archaeological Resources and Tribal Cultural Resources

As described in Section 3.4 Cultural Resources, record searches have been conducted to identify potential cultural resources in the project area. Two recorded resources were identified within the project area and eight within a 500-foot search buffer. No significant resources or resources eligible for listing in the National Register of Historic Places/California Register of Historical Resources were identified from these recorded resources. A field survey was conducted on July 28, 2020, to identify archaeological resources in the project area. No archaeological resources were found in the project vicinity. The District also consulted with Native Americans under AB 52 to identify any tribal cultural resources. As discussed in Section 3.15, no tribal cultural resources were identified in the project area. Despite these efforts and results, the inadvertent discovery of unknown archaeological resources or tribal cultural resources during construction from ground-disturbing activities cannot be entirely discounted. The inadvertent discovery of archaeological resources or tribal cultural resources resulting from the proposed project and cumulative projects could result in a significant cumulative impact on archaeological resources or tribal cultural resources if the resources were not adequately addressed to avoid destruction. Because no archaeological or tribal cultural resources are known to occur in the area, the nature of any archaeological or tribal cultural resource encountered during construction cannot be determined, and while unlikely, it is possible that resource encountered during construction of the proposed project could be part of a larger site or district that would potentially be disturbed during construction of cumulative projects. If the project were to encounter archaeological or tribal cultural resources that were part of a larger historic site or district, the project's contribution to the significant impact would be considerable. The District would implement Mitigation Measure 3.4-2, which specifies procedures to follow in the event of an inadvertent discovery to avoid damage of archaeological

resources. Because Mitigation Measure 3.4-2 defines procedures to avoid and minimize potential impacts to previously undiscovered resources including protecting resources in place, the project would avoid impacts on archaeological and tribal cultural resources with mitigation; therefore, the project's contribution to cumulative impacts on archaeological and tribal cultural resources would not be considerable, and would therefore be less than significant with mitigation.

Human Remains

No human remains are known to occur in the project area or vicinity. The cumulative projects and proposed projects would need to comply with Marin Development Code Section 22.20.040 (D), Public Resources Code Section 5097.98, and Health and Safety Code Section 7050.5, which specify requirements for discovery of human remains. No significant cumulative impact would occur due to compliance with state and county requirements for discovery of human remains.

4.4.5 Energy

Geographic Scope

The geographic scope of analysis for cumulative energy impacts is all projects within the Marin County Energy service territory since Marin County Energy would be the energy provider for the project.

Cumulative Projects

All of the cumulative projects in Table 4.3-1 are located within Marin County Energy territory. However, many of the cumulative projects would only require energy to fuel construction equipment and would not require a long-term energy supply.

Cumulative Impacts

Construction

As discussed in Section 3.5 Energy, under Impact 3.5-1, construction of the project would require the use of energy resources; however, energy consumption would be temporary and limited to the construction phases of the project. Construction would not require a large amount of energy due to the short duration of the construction (seven months) and limited amount of equipment and associated fuel requirement. In addition, the project would comply with Section 2485 of the California Code of Regulations, which reduces use of fuel during idling by limiting idling of heavy trucks traveling to and from the project area.

The projects identified in Table 4.3-1 would be subject to the same regulatory framework as the project for the use of fuel and energy during construction, which includes Bay Area Air Quality Management District Basic Construction Measures and the California Green Building Code. Compliance with the measures identified would ensure compliance with regulatory policies to minimize the potential for cumulative energy impacts. Therefore, the potential for cumulative energy impacts during construction would be less than significant.

Operation

As described in Section 3.5 Energy, under Impact 3.5-1, project operation would only require new energy resources to operate the proposed stormwater pump station. The pump station would only operate immediately following storm events when creek levels rise above the elevation of the existing outfall. The limited energy use from the project would not contribute considerably to a cumulative impact, and a significant cumulative impact would not occur.

4.4.6 Geology and Soils

Geographic Scope

The San Francisco Bay Area is a seismically active region with a wide range of geologic and soils conditions that can vary greatly within a short distance. Accordingly, geologic and soils impacts tend to be site specific and depend on the local geology and soil conditions. For these reasons, the geographic scope for potential cumulative geologic and soils impacts consists of the project elements locations and only the immediately adjacent areas with similar geologic and soil conditions. In general, to have a cumulative impact on geology and soils, two or more projects would have to be located within 1,000 feet or less to cause cumulative geologic and soils impacts.

Cumulative Projects

The Access Ramp to Corte Madera Creek (#1), Cedar Tentative Map (#11), Lower Corte Madera Creek Improvement Study (#21), Corte Madera Creek Project Phase II (#23), and Sir Francis Drake Boulevard Rehabilitation Project (#24), and the Learning Resources Center Project (#34) would occur in proximity to portions of the project.

Cumulative Impacts

Seismic Shaking and Liquefaction

Many parts of the Bay Area are at risk of personal or property damage related to seismic shaking, seiche or tsunami, or liquefaction. People working on the project would be subject to these risks, but this risk is not isolated to the project area. The project area (as with all development projects in the region) must comply with design standards developed to minimize risk from damage from seismic events. The project also does not propose any new structures that could create a risk to life or property as a result of seismic shaking. The cumulative impact would be less than significant.

Soil Loss

All cumulative projects that exceed 1 acre in surface disturbance would be required to obtain Construction General Permit coverage and implement SWPPP. The SWPPP would include best management practices to control runoff and prevent erosion. Through compliance with the Construction General Permit, the potential for erosion impacts and loss of topsoil would be reduced to less-than-significant level. The project would not contribute to a cumulative erosion impact.

Paleontological Resources

As discussed in Section 3.6 Geology and Soils, the geologic and soil units within the project area are of low paleontological sensitivity. A significant cumulative impact on paleontological resources would not occur.

4.4.7 Greenhous Gas Emissions

Greenhouses gases are by nature a cumulative impact as a result of global activities. The analysis of greenhouse gas emission presented in Section 3.7 Greenhouse Gas Emissions is in a cumulative context because the impact is inherently cumulative. The project's contribution to the significant cumulative global greenhouse gas impacts would be less than considerable, as discussed in Section 3.7.

4.4.8 Hazards and Hazardous Materials

Geographic Scope

The geographic scope of analysis for cumulative hazardous materials impacts encompasses the project area and a 0.25-mile buffer from the project and travel routes. Many impacts related to hazardous materials are largely site specific and depend on the nature and extent of the hazardous materials release as well as existing and future soil and groundwater conditions. For example, hazardous materials incidents tend to be limited to a smaller, more localized area surrounding the immediate location and extent of the release and could only be cumulative if two or more hazardous materials releases overlap spatially. (An exception to this is a groundwater plume of contaminants released from an otherwise isolated source.) Consequently, hazardous materials impacts related to routine use, accidental release, or being located on a listed hazardous materials site compiled pursuant to Government Code Section 65962.5 are site specific and are not cumulative in nature. In addition, impacts relative to hazardous materials are also time--specific.

Cumulative Projects

The cumulative projects identified in Table 4.3-1 would likely require transport of hazardous materials on Highway 101 and Sir Francis Drake Boulevard during construction. Construction of cumulative projects #1 through #5, #16, #18, ~~and~~ #22 through #25, and #34 would require transport of small volumes of hazardous materials for vehicle and equipment operations during construction.

Cumulative Impact

Impacts Avoided

As discussed in Section 3.8 Hazards and Hazardous Materials, the project would have no impact with respect to being located near hazardous material sites, within two miles of an airport or airstrip, or within wildland fire hazards. The project does not include the use or installation of septic tanks or alternative water disposal systems. Therefore, the project could not contribute to cumulative impacts related to these topics and are not discussed further.

Routine Use, Transport, or Disposal of Hazardous Materials
The projects identified in Table 4.3-1 would involve construction activities using equipment that would use fuels, oil and lubricants, and cleaning solvents. Construction and demolition activities are required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies, and to respond to accidental spills, if any. The cumulative impact from routine use, transport, and disposal of hazardous material would be less than significant.

Handle Hazardous Materials within 0.25 Mile of Schools
As discussed in Section 3.8 Hazards and Hazardous Materials, the project is located within 0.25 mile of three schools. The only cumulative projects located within 0.25 mile of the same schools include the Access Ramp to Corte Madera Creek (#1) and Corte Madera Creek Project Phase II (#23), and the Learning Resources Center Project (#34). Project construction equipment emissions, materials handling, and waste handling would have the potential to impact schools within 0.25 mile of the cumulative project elements. However, the proposed project and cumulative projects are required to adhere to Occupational Safety and Health Administration (OSHA) and California OSHA health and safety requirements when handing hazardous materials; adhere to Resource Conservation and Recovery Act and U.S. Department of Transportation regulations when transporting hazardous materials; and adhere to all applicable federal, state, and local laws when disposing of soil and hazardous waste. The proposed project and cumulative projects would not result in a significant cumulative impact.

Emergency Response
The proposed project would not be constructed at the same time as the Sir Francis Drake Boulevard Rehabilitation Project and would not affect potential emergency evacuation on Sir Francis Drake Boulevard. No cumulative impacts on emergency evacuation would occur.

4.4.9 Hydrology and Water Quality

Geographic Scope
The cumulative geographic scope of analysis for hydrology and water quality is the Corte Madera Creek watershed.

Cumulative Projects
All of the cumulative projects are located within the Corte Madera Creek watershed. Projects that could contribute to significant cumulative water quality impacts include the following:

- Access Ramp to Corte Madera Creek (#1)
- Meadow Way Bridge (#2)
- San Anselmo Creek Flood Control – Nursery Basin Site (#3)
- San Anselmo Creek Flood Control – 634 – 636 Demolition (#4)
- Hillview Pump Station and Storm Drain (#5)
- Winship Avenue Bridge Replacement Project (#6)

- Lower Corte Madera Creek Improvement Study (#21)
- Lower Sleepy Hollow Creek Improvements (#22)
- Corte Madera Creek Project Phase II (#23)
- Azalea Avenue Bridge Replacement Project (#26)
- Nokomis Avenue Bridge Replacement Project (#27)
- Madrone Avenue Bridge Replacement Project (#28)
- Center Boulevard Bridge Replacement Project (#29)

Cumulative Impacts

Impacts Avoided

The project would have no impact related to creating or contributing to runoff water that would exceed the capacity of stormwater drainage systems or placing housing in an area with potential for inundation by seiche, tsunami, or mudflow. Therefore, the project would not have the potential to contribute to a significant cumulative impact of these kinds. The following discussions analyze the cumulative impacts relative to flooding, water quality, erosion, and groundwater.

Flooding within the Ross Valley and Cumulative Projects

As discussed in Chapter 2, Project Description, flooding regularly occurs within the Ross Valley watershed, which includes Corte Madera Creek. The District is implementing the Ross Valley Flood Protection and Watershed Program (Program), which includes multiple projects listed in Table 4.3-1 to address the existing flooding conditions. The Program would implement a phased program over the next 30 years to achieve designated levels 10- to 25-year flood-event protection (Phase 1) and 25- to 100-year flood-event protection (Phase 2). The Program includes a combination of several flood control elements that, once collectively implemented, would provide flood-risk reduction on a watershed-wide scale. The elements include flood diversion and storage (FDS) basins, located in the upper reaches of the watershed to detain peak flows into the creek network during flood events, bridge replacements in Fairfax, San Anselmo, and Ross to remove impediments to flows in the creek and reduce localized flooding, and creek improvements in the lower end of the watershed to increase capacity and stability in the lower reaches to handle flood flows as they move through the watershed. In addition to the FDS basins and elements that increase creek capacity, the Program includes additional flood-risk reduction activities, including policies to encourage low-impact development (LID), flood preparedness, and educational activities throughout the lifespan of the Program. These elements are proposed to reduce the frequency and severity of flooding in the Ross Valley.

These proposed elements have been included after technical analysis[1] determined that they were the most suitable actions that can be taken to reduce flooding risk in the Ross Valley watershed, given the regional topography, the existing creek network, flow bottlenecks, and the constraints on available space to develop program elements. According to hydraulic model simulations, neither increasing creek capacity alone nor developing FDS basins alone would be sufficient to prevent flooding within the Corte Madera Creek watershed during a 100-year flood.[2] Notably, implementing all of the creek capacity elements alone will not provide the desired level of flood-risk reduction. To achieve 100-year flood protection, some volume of flood flows will need to be captured in FDS basins. There is some flexibility in the sizing, locations, and operation of the FDS basins throughout the watershed; however, they must be located strategically to assist in meeting the flow-rate targets in each subwatershed. By installing both FDS basins and elements that increase creek capacity, a 100-year flood event similar to the December 2005 flood could be contained within the banks of the stream network, thereby reducing flood risk throughout Ross Valley. Therefore, implementation of the Program would have a beneficial effect on cumulative flooding and flood risk within the Corte Madera Creek watershed.

In order to meet the Program's primary objective, which is to substantially reduce the frequency and severity of flooding within Ross Valley, a hydraulic analysis of the Ross Valley was undertaken to identify where flooding is occurring during various storm-event scenarios.[3] Through this analysis, a combination of critical reaches and flow targets was identified to support the design of the Program, as described below.

Critical Reaches

Based on the analysis, there are four "critical reaches" in Ross Valley where, during large floods, floodwaters overflow and escape from the creeks and flow for extended distances on the historical floodplain as separate side-streams apart from the main channel. During very large floods, these floodwaters damage structures in the floodplain and threaten public safety. Owing to their limited conveyance capacity, these four critical reaches represent the weakest links in the creek system. Accordingly, they are the focus of the Program elements aimed at increasing creek capacity. The four critical reaches are:

1. Fairfax Creek critical reach, located within the Fairfax subwatershed;

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[1] This analysis included the *Capital Improvement Plan Study for Flood Damage Reduction and Creek Management for Flood Zone 9/Ross Valley* (CIP) (Stetson Engineers Inc., 2011), the *Ross Valley Flow Reduction Study Report* (CH2M, 2015), and hydraulic modeling.

[2] The 100-year flood is the flood event that has a 1% chance of occurring or being exceeded in any year based on historical records and model projections.

[3] This analysis included the *Capital Improvement Plan Study for Flood Damage Reduction and Creek Management for Flood Zone 9/Ross Valley* (CIP) (Stetson Engineers Inc., 2011) and hydraulic modeling.

2. Sleepy Hollow Creek critical reach, located within the San Anselmo subwatershed;
3. San Anselmo Creek critical reach, including downtown San Anselmo, located within the San Anselmo subwatershed; and
4. Corte Madera Creek and Ross Creek critical reach, located within the Ross subwatershed.

Flow Targets

Increasing creek capacity in the critical reaches, while important, is not sufficient in all locations by itself to reduce flooding to protect life and property in the area. Rather, the Program must also reduce flows upstream of the critical reaches, an outcome that can be achieved by building FDS basins. Three locations in the watershed (one in each of the Fairfax, San Anselmo, and Ross subwatersheds) have been assigned flow targets – meaning locations where flows should be reduced to specified levels in order to reduce flooding downstream in the critical reaches.

The three key flow targets (#26 on Figure 4.3-1) are as follows:

1. Fairfax Subwatershed: Target 100-year flow of 1,100 cfs at the Fairfax Town Hall.
2. San Anselmo Subwatershed: Target 100-year flow of 4,540 cfs at Sycamore Bridge in San Anselmo.
3. Ross Subwatershed: Target 100-year flow of 5,540 cfs at the USGS Streamflow Gage at Ross.[4]

These targets were developed through hydraulic modeling to reflect the maximum flow rate that could be allowed at each location and still achieve containment of the anticipated flow from a 100-year flood event in the identified critical reaches, assuming all elements identified in the Program to increase the creek capacity are implemented.

Cumulative Development Projects

Implementation of projects in Table 4.3-1 may increase impervious surface areas associated with development. The largest of these projects is the Marin Healthcare District Project, which would include construction of a new five-story building and a six-story parking structure with ground level footprint totaling approximately 40,000 square feet. Each of the development projects would be required to comply with federal, state, and local requirements regarding stormwater management, including Provision E.12 of the State Water Board under the Phase II NPDES Municipal Regional Permit. Provision E.12 of the 2013 MS4 permit includes post-construction stormwater management requirements that permittees (such as Marin County) must incorporate into their land use approvals. Site design measures (such as stream setbacks and buffers, rooftop and impervious area disconnection, and vegetated swales) must be implemented for projects approved by the County that create or replace between 2,500 and

[4] The flow target of 5,540 cfs at the USGS Streamflow Gage at Ross is intentionally in alignment with the proposed design flow rate for the USACE Project.

5,000 square feet of impervious surface. Projects that create and/or replace 5,000 square feet or more of impervious surface must implement measures for site design, source control, runoff reduction, stormwater treatment, and baseline hydromodification management as defined in the 2013 MS4 permit. These requirements have been adopted by Marin County and are codified in Section 24.04.627 (Permanent Stormwater Controls for New and Redevelopment) of the Marin County Municipal Code. Compliance with local ordinances, design review, and Provision E.12 would reduce the contribution of these projects to flood conditions within the Ross Valley such that the cumulative impact from proposed development projects would be less than significant.

Cumulative Effects

Flooding

Implementation of the cumulative flood-risk reduction projects included in the Program would result in a cumulative reduction in flood risk in Ross Valley. The cumulative impact from implementation of the proposed project and cumulative flood-control projects in Ross Valley (including cumulative projects #2, 3, 4, 6, 26, 27, 28, and 29) is shown in the future condition analysis in Section 3.9 Hydrology and Water Quality (refer to Figure 3.9-7 through Figure 3.9-9). The cumulative impact of the proposed project and cumulative projects on flooding would be beneficial and no adverse cumulative impact would occur.

Water Quality, Erosion, and Sedimentation

The proposed project and cumulative projects that involve greater than 1 acre in surface disturbance are required to comply with the Construction General Permit and prepare and implement a project-specific SWPPP and sediment and erosion-control BMPs. Construction of the proposed project and cumulative projects would not result in a significant cumulative impact on water quality, erosion, or sedimentation.

In combination with other projects that alter structures in the Corte Madera Creek channel, in particular the flood-risk reduction projects, the proposed project could alter erosion and sediment deposition processes. The cumulative impact from implementation of the proposed project and cumulative flood-risk reduction projects in Ross Valley are shown in Figure 3.9-7 through Figure 3.9-9. As discussed in Impact 3.9-2 in Section 3.9 Hydrology and Water Quality, the bank and bed stability and channel widening project elements would result in a cumulative beneficial erosion and siltation impact. Because the analysis in Section 3.9 addresses future conditions with implementation of cumulative projects, the analysis also addresses the cumulative impact. As demonstrated in Section 3.9, the cumulative impact would be less than significant.

Groundwater

The project would only require very localized dewatering of groundwater during excavation of the fish pools and the lower Corte Madera Creek concrete-channel removal. The dewatering would be highly localized at each area of excavation and would only last a few weeks. Due to the short duration and limited amount of water that could be removed by the project, there is

no potential for cumulative groundwater impacts because no cumulative project would require dewatering in proximity to the proposed project at the same time.

4.4.10 Noise

Geographic Scope

The geographic context for cumulative noise and vibration impacts includes projects within 1,000 feet of the proposed project. Projects located at distances greater than 1,000 feet from the proposed project would not generate noise levels that would be considerable in combination with anticipated project noise. Vibration dissipates rapidly with distance. The geographic scope of analysis for vibration is 100 feet.

Cumulative Projects

The Access Ramp to Corte Madera Creek (#1), the Cedar Tentative Map (#11), the Lower Corte Madera Creek Improvement Study (#21), Corte Madera Creek Project Phase II (#23), and Sir Francis Drake Boulevard Rehabilitation Project (#24), and the Learning Resources Center Project (#34) are located within 1,000 feet of portions of the project.

Cumulative Impacts

Impacts Avoided

As described under Section 3.10 Noise, the project would have no impact related to exposing people to excess noise due to proximity to an airport or private airstrip. Because the project area would not involve locating people near or increasing use of an airport or private airstrip, there would be no significant cumulative noise impacts to which the project would contribute.

Noise and Vibration

The proposed project and cumulative projects would only generate substantial noise and vibration during the construction phase. Cumulative noise and vibration impacts would, therefore, only occur if the proposed project and cumulative projects within 1,000 feet of the proposed project were constructed at the same time. The access ramp to Corte Madera Creek, ~~and~~ Sir Francis Drake Boulevard Rehabilitation, and Learning Resources Center Project would be constructed prior to the proposed project and would not cause a cumulative noise impact. The Cedar Tentative Map would subdivide a parcel but would not result in any new noise or vibration. The remaining cumulative projects are in very early planning and design phases and would be constructed after the proposed project. Cumulative noise and vibration impacts would not occur because none of the cumulative projects would be constructed in proximity to the proposed project at the same time as the proposed project.

4.4.11 Public Services

Geographic Scope

The geographic scope of analysis for public services includes the Town of Ross and unincorporated Marin County, which provide public services to the project area.

Cumulative Projects

One of the projects identified in Table 4.3-1 would be under construction at the same time as the project (Winship Avenue Bridge Replacement Project).

Cumulative Impacts

Demand for Public Services

Incidents could occur during construction requiring law enforcement, fire protection, or emergency medical services. As discussed in Section 3.11 Public Services, Impact 3.11-1, construction of the flood-risk reduction project is not expected to increase demand for law enforcement, fire protection, and emergency medical services. In addition, the project construction would be temporary and would not generate additional permanent employees or residents in the project area; therefore, the project would not require the construction of new or physically altered governmental facilities that are not already planned. The project in combination with other projects would have less than significant cumulative impacts related to public services.

Maintenance of Public Facilities Including Roads

The project and cumulative projects would result in temporary increase in truck traffic on Sir Francis Drake Boulevard during construction. Sir Francis Drake Boulevard is currently undergoing pavement rehabilitation. The proposed project and cumulative project truck traffic would be within the design standards for Sir Francis Drake Boulevard. The cumulative impacts on maintenance of public roads would be less than significant.

4.4.12 Recreation

Geographic Scope

The geographic scope of analysis for recreation includes the parks, trails, and bikeways affected by the proposed project.

Cumulative Projects

Cumulative projects that could affect the same parks, bikeways, and trails as the proposed project include the following:

- Lower Corte Madera Creek Improvement Study (#21)
- Corte Madera Creek Project Phase II (#23)
- North-South Greenway Gap Closure Project (#25)

Cumulative Impacts

Impacts Avoided

Construction and operation of the project would not require the designation of additional park land to remain in conformance with locally acceptable or adopted park standards. Therefore, there would be no significant cumulative impact on these resources to which the project would contribute.

Construction of Recreational Facilities
The proposed project and North-South Gap Closure Project would require construction of segments of Bike Route 20. The North-South Gap Closure Project is located over 1 mile from the proposed project and would not result in cumulative impacts from construction and modification of Bike Route 20. Cumulative impacts would not occur.

The Lower Corte Madera Creek Improvement Study and Corte Madera Creek Project Phase II projects could require modifications to Bike Route 20 to allow for the floodplain improvements. Both projects are in early-phase planning and design, and the impacts on Bike Route 20 from either project would be speculative and would occur after the projects were constructed. Cumulative impacts would not occur.

Impacts on Recreational Opportunities
Construction of the proposed project and North-South Greenway Gap Closure Project could occur in 2022. The proposed project's temporary closure of Bike Route 20 and North-South Greenway Gap Closure Project are separated by over 2 miles, and each project would be able to detour bicyclist traffic during construction without affecting the other project. A cumulative adverse impact on recreational opportunities would not occur.

4.4.13 Transportation and Traffic

Geographic Scope
The geographic scope for transportation and traffic impacts includes the roadways that would be used to access the proposed project during construction.

Cumulative Projects
All of the cumulative projects in Table 4.3-1 would require access on Sir Francis Drake Boulevard.

Cumulative Impacts

Conflict with Program, Plan, Ordinance, or Policy Addressing the Circulation System
The Congestion Management Program (CMP) for Sir Francis Drake Boulevard was prepared to address cumulative traffic impacts on Sir Francis Drake Boulevard. The threshold for analysis of cumulative impacts includes generation of greater than 100 vehicle trips during peak hours. As discussed in Section 3.13, Impact 3.13-1, the proposed project would generate an average of 94 trips per day and less than the 100-trips-per-peak-hour CMP threshold. The project would not contribute considerably to a significant cumulative traffic impact on Sir Francis Drake.

Conflict with CEQA Guidelines 15064.3(b)
CEQA Guidelines Section 15064.3 (b), which requires evaluation of vehicle miles traveled, is a cumulative impact analysis by nature and is intended to address new cumulative traffic generated by development. The project-level threshold for evaluating a significant vehicle-miles-traveled impact is therefore the same as the cumulative threshold. As discussed in Section 3.13, Impact 3.13-2, the project construction would generate less than the significance

threshold used for new development. The project would not contribute considerably to a significant vehicle-miles-traveled impact.

Traffic Hazards and Emergency Access
The project would require detours of bicycle and pedestrian traffic during construction. The project would also require very short-term lane closures at College Avenue and Laurel Avenue. The temporary detours and lane closures would not coincide with any other cumulative project construction that would be occurring in the area. No cumulative impact on traffic hazards or emergency access would occur.

4.4.14 Utilities and Service Systems

Geographic Scope
The geographic scope of analysis for utilities and service systems is the region served by the same utility and service providers.

Cumulative Projects
All of the projects in Table 4.3-1 are located in the same utility service area as the proposed project.

Cumulative Impacts

Relocation or Construction of Utilities
As discussed in Section 3.15 Utilities and Service Systems, Impact 3.15-1, the project would not require the construction of new facilities for water or wastewater or require the relocation of any facilities. The project would require a temporary tap to a PG&E electrical line at the stormwater pump station. The temporary tap is not located in proximity to any cumulative projects, and the very limited use of electricity when the pump station is operating would not result in a significant cumulative impact that could cause expansion of any electrical utilities. The cumulative impact would be less than significant.

Sufficient Water Supplies, Wastewater Treatment, and Landfill Capacity
The analysis of water, wastewater, and landfill capacity is by its very nature a cumulative impact analysis because it requires consideration of the capacity of the water supply, wastewater supply, and landfills to adequately serve existing and proposed uses. As described in Section 3.15 Utilities and Service System, project construction would have short-term and less-than-significant impacts on water supplies, wastewater, and landfill capacity. Operation and maintenance activities would not create long-term requirements for additional water, waste water, or landfill capacity. Therefore, the project would not cause a significant cumulative impact on these resources.

4.4.15 Forestry Resources

Geographic Scope

The geographic scope for the analysis of potential cumulative forestry resources impacts includes the Corte Madera Creek watershed.

Cumulative Projects

Several of the cumulative projects will require removal of trees, including the following:

- San Anselmo Creek flood control – nursery basin site (#3)
- Hillview pump station and stormdrain (#5)
- Brownridge tree removal (#12)
- Cooney tree removal (#14)
- Real Equity tree removal (#20)
- Lower Sleepy Hollow Creek Improvements (#22)
- Corte Madera Creek Project Phase II (#23)
- Learning Resources Center Project (#34)

Cumulative Impact

The cumulative projects identified in Table 4.3-1 are required to obtain a permit from Marin County or other local jurisdictions for removal of trees greater than 6 inches diameter at breast height. The County and local tree permits require replacement plantings for trees that will be removed by the cumulative projects. Compliance with the mitigation included in each project's tree removal permit will result in replacement of trees removed by cumulative projects. The cumulative projects in combination with the proposed project would not result in a cumulative impact on forestry resources because each of the cumulative projects would provide mitigation to offset the trees removed. The cumulative impact would be less than significant. ~~Land Use and Planning~~

4.4.16 Land Use and Planning

Geographic Scope

The geographic scope of land use and planning impacts includes the Town of Ross and unincorporated Kentfield areas.

Cumulative Projects

Cumulative projects located within the geographic scope of analysis include the Winship Avenue Bridge Replacement Project (#6), the access ramp to Corte Madera Creek (#1), a number of minor structures, tree removal, and land-use modifications (projects #7 #8, #9, #10, #11, #12, #13, #15, #17, #19, and #20), ~~and~~ the Marin Health Care District, and the Learning Resources Center Project (#34).

Cumulative Impacts

Impacts Avoided
The project would not cause a significant environmental impact due to a conflict with a land use plan or regulation adopted for the propose of avoiding or mitigating an environmental effect and would, therefore, not cause a significant cumulative impact.

Physically Divide a Community
Neither the proposed project nor any cumulative project proposes any infrastructure that would physically divide a community. A significant cumulative impact would not occur.

Substantial Alteration of the Character of the Community
The reduction in canopy cover at Frederick Allen Park would result in a temporary reduction of the urban forest and visual separation from private properties on Sir Francis Drake Boulevard. No cumulative projects are proposed within Frederick Allen Park or the immediate surroundings. The cumulative projects would not affect the character of the park and surrounding residential areas. No cumulative impacts on the character of the community would occur.

4.5 References

BAAQMD. (2017, May). California Environmental Quality Act Air Quality Guidelines .

CH2M. (2015, November). Ross Valley Flow Reduction Study Report .

Houston, W. (2020, October 22). *Key connector for North Bay bike path nears construction*. Retrieved October 23, 2020, from Marin Independent Journal: https://www.marinij.com/2020/10/22/key-connector-in-north-bay-bike-walking-path-set-for-funding/

Larkspur & Corte Madera. (2020). *North-South Greenway Gap Closure Project*. Retrieved October 23, 2020, from http://www.nsgreenwaygapclosure.com/

Marin County Community Development Agency. (2020). *Projects by Geographical Location*. Retrieved August 24, 2020, from https://www.marincounty.org/depts/cd/divisions/planning/projects

Marin County DPW. (2020). *Upgrade the Drake - About the Project*. Retrieved July 29, 2020, from http://www.upgradethedrake.com/about-the-project/

Simonitch, R. (2020, July 31). Email Communication between Richard Simonitch, Town of Ross Public Works Director, and Yingying Cai, Panorama Environmental Planner.

Stetson Engineers Inc. (2011, May). Capital Improvement Plan Study for Flood Damage Reduction and Creek Management in Flood Zone 9/Ross Valley .

The District. (2015a, October 1). *Lower Sleepy Hollow Creek Improvements (Morningside Neighborhood Area)*. Retrieved August 3, 2020, from https://www.marinwatersheds.org/resources/projects/lower-sleepy-hollow-creek-improvements-morningside-neighborhood-area

The District. (2015b, October 1). *Lefty Gomez Dual-Use Facility at White Hill Middle School Study*. Retrieved August 3, 2020, from https://www.marinwatersheds.org/resources/projects/lefty-gomez-dual-use-facility-white-hill-middle-school-study

The District. (2018, August 24). *Lower Corte Madera Creek Improvement Study*. Retrieved August 3, 2020, from https://www.marinwatersheds.org/resources/projects/lower-corte-madera-creek-improvement-study

The District. (2019, August 1). *Hillview Pump Station & Stormdrain Improvements*. Retrieved July 29, 2020, from https://www.marinwatersheds.org/resources/projects/hillview-pump-station-stormdrain-improvements

The District. (2020, June 15). *San Anselmo Flood Risk Redcution (SAFRR) Project*. Retrieved July 29, 2020, from https://www.marinwatersheds.org/resources/projects/san-anselmo-flood-risk-reduction-safrr-project

Town of Fairfax. (2020). *Meadow Way Bridge*. Retrieved July 29, 2020, from http://fairfaxbridges.com/about/meadow-way/

5 Alternatives

5.1 Introduction

This chapter presents descriptions and evaluations of alternatives to the Corte Madera Creek Flood Risk Management Project, Phase 1 (project) (including the required No Project Alternative), describes the alternatives screening process and alternatives eliminated from consideration, compares the environmental merits of the alternatives, and identifies the environmentally superior alternative.

Section 15126.6(a) of the California Environmental Quality Act (CEQA) Guidelines states that an EIR must describe and evaluate a reasonable range of alternatives to the proposed project that would feasibly attain most of the project's basic objectives but would avoid or substantially lessen any identified significant adverse environmental effects of the proposed project. Specifically, the CEQA Guidelines (Section 15126.6) set forth the following criteria for selecting and evaluating alternatives:

1. **Identifying Alternatives.** The selection of alternatives is to focus on identifying those alternatives that would avoid or substantially lessen any of the significant effects of the project, are feasible, and would attain most of the basic objectives of the project. Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site. An Environmental Impact Report (EIR) need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. The specific alternative of "No Project" also must be evaluated. The "No Project" analysis is to discuss existing conditions at the time the environmental analysis is begun, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved.
2. **Range of Alternatives.** An EIR need not consider every conceivable alternative but must consider and discuss a reasonable range of feasible alternatives in a manner that will foster informed decision-making and public participation. The "rule of reason" governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those alternatives necessary to permit a reasoned choice. The lead agency (Marin County Flood Control and Water Conservation District [District]) is responsible for selecting a range of project

alternatives to be examined and for disclosing its reasons for the selection of the alternatives.

3. **Evaluation of Alternatives.** An EIR is required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. Matrices may be used to display the major characteristics and environmental effects of each alternative. If an alternative would cause one or more significant effects that would not result from the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the proposed project.

5.2 Approach to Alternatives Selection

5.2.1 Overview of Selection Process

Consistent with CEQA (Public Resources Code, Section 15004[b][1]), the District incorporated consideration of environmental impacts as well as environmental benefits into conceptualization, planning, and design for the project. The process for selecting alternatives to be evaluated in the EIR included gathering public input on potential alternatives to consider and defining alternatives to reduce environmental impacts during project planning and the preparation of this EIR, screening alternatives against CEQA alternatives screening criteria, and evaluating whether to retain each alternative for analysis in the EIR. The alternatives retained for analysis in this EIR are presented in Section 5.3. A comparison of these alternatives against the project is presented in Section 5.4.

5.2.2 Alternatives Considered during Project Planning

The alternatives considered during the project planning process included:

- alternatives evaluated in the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR), prepared by U.S. Army Corps of Engineers (USACE) in 2018;
- alternatives that were suggested in comments submitted during the public review period of the Draft EIS/EIR, prepared by USACE in 2018;
- alternatives developed by the District through evaluation of significant environmental impacts; and
- alternatives suggested by the public during the 2020 EIR scoping process.

5.2.3 Alternatives Screening Methodology

Screening Methodology

The alternatives that were considered during project planning were evaluated using a screening process consisting of three steps:

Step 1: Clearly define each alternative to allow comparative evaluation.

Step 2: Evaluate each alternative in comparison with the project using CEQA criteria (defined below)

Step 3: Based on the results of Step 2, determine the suitability of each alternative for full analysis in the EIR. If the alternative is unsuitable, eliminate it from further consideration.

CEQA Requirements for Alternatives

CEQA provides guidance on selecting a reasonable range of alternatives for evaluation in an EIR. This alternatives screening and evaluation process satisfies CEQA requirements. The CEQA requirements for selection of alternatives are described next.

An important aspect of EIR preparation is identification and assessment of a reasonable range of alternatives that have the potential for avoiding or minimizing the impacts of a project (CEQA Guidelines, Section 15126.6[d]). The CEQA Guidelines also require consideration of the No Project Alternative (Section 15126.6[e]). The EIR must adequately assess these alternatives to allow a comparative analysis for consideration by decision makers. Section 15126.6(a) of the CEQA Guidelines state that:

> An EIR shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation.

To comply with CEQA requirements, each alternative that has been suggested or developed for the project has been evaluated in three ways:

1. Does the alternative accomplish all or most of the project objectives?
2. Is the alternative potentially feasible (from economic, environmental, legal, social, and technological standpoints)?
3. Does the alternative avoid or substantially lessen any significant effects of the project (including consideration of whether the alternative itself could create significant environmental effects potentially greater than those of the project)?

Each of these criteria is described in more detail in the following sections.

Project Goals and Objectives

The primary goals of the project are to reduce the frequency and severity of flooding, and to protect human life and property in the communities of Ross and Kentfield by enhancing and improving Corte Madera Creek. The District has defined the following six project objectives:

1. **Flood Risk Reduction.** Reduce overall flood inundation extent and depth in the Town of Ross and Kentfield area.

2. **Environmental Benefits.** Improve fish passage, natural creek processes, and fish and riparian habitats adjacent to the creek.
3. **Public Access and Enhanced Recreational Experience.** Maintain public access along the creek via the multi-use path and enhance the recreational experience and amenities along the creek corridor to meet the Town of Ross and Kentfield area community needs.
4. **Operational Reliability.** Improve operational reliability and reduce long-term maintenance costs by increasing maintenance access, improving channel stability, and protecting existing utilities.
5. **Regulatory Compliance.** Comply with local, State, and federal environmental laws and regulations.
6. **Fiscally Responsible Flood Risk Reduction.** Implement a flood risk reduction project that can be accomplished with currently available local and grant funding and reasonably foreseeable grant funding opportunities.

The CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives" (Section 15126.6[b]). Therefore, CEQA does not require that each alternative meet all the project objectives identified above. The determination of whether to eliminate or retain alternatives in the EIR was based on each alternative's ability to adequately meet most of the project objectives, as defined by the District. Each alternative that met four or more of the six project objectives was moved forward to screen for feasibility.

Feasibility

Section 15364 of the CEQA Guidelines define feasibility as "...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." The alternatives screening analysis mainly is governed by what CEQA terms the "rule of reason," meaning that the analysis should remain focused not on every possible eventuality but rather on the alternatives necessary to permit a reasoned choice. Alternatives that are potentially feasible, while still meeting most project objectives, are to be fully analyzed in the EIR if they also reduce a project's environmental impacts.

According to Section 15126.6(f)(1) of the CEQA Guidelines, the factors that may be considered when addressing the potential feasibility of alternatives include site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or other regulatory limitations, jurisdictional boundaries, and the project proponent's control over alternative sites. For the screening analysis, the potential feasibility of alternatives was assessed by considering the following factors:

- **Legal Feasibility.** Would the alternative have the potential to avoid land with uses having legal protection that may prohibit or substantially limit the feasibility of permitting channel improvements? Land use afforded legal protections that would prohibit project construction or would require an act of Congress for permitting is

considered to be a less feasible location for the project. Such land use designations include wilderness areas, wilderness study areas, restricted military bases, airports, and Native American reservations.

- **Regulatory Feasibility.** Would regulatory restrictions substantially limit the likelihood of successful permitting of a high-voltage transmission line? Is the alternative consistent with regulatory standards for transmission system design, operation, and maintenance?
- **Technical Feasibility.** Would the alternative be potentially feasible from a technological perspective, considering available technology? Would any construction, operation, or maintenance constraints be likely to occur that could not be overcome?
- **Economic Feasibility.** Would the alternative be so costly that its implementation would be prohibitive? Section 15126.6(b) of the CEQA Guidelines requires consideration of alternatives capable of eliminating or reducing significant environmental effects, although they may "impede to some degree the attainment of the project objectives, or would be more costly." In 1988, the Court of Appeals determined in Citizens of Goleta Valley v. Board of Supervisors: ". . .The fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability would be severe enough to render it impractical to proceed with the project."
- **Environmental Feasibility.** Would implementation of the alternative cause substantially greater environmental damage than the project, thereby making the alternative clearly inferior from an environmental standpoint? Would the alternative reduce any potentially significant project impact? This issue primarily is to be addressed in terms of the alternative's potential to eliminate potentially significant project effects.

Potential to Eliminate Significant Environmental Effects

A key CEQA requirement for an alternative is that it must have the potential to "avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines, Section 15126.6[a]). At the screening stage, evaluating or quantifying all the impacts of the alternatives in comparison to the project would not be possible. However, identifying elements of an alternative that are likely to be the sources of impacts and relating them, to the extent possible, to general conditions in the project area would be possible.

The project's potentially significant environmental impacts were identified and evaluated to develop alternatives and determine whether an alternative would meet the CEQA Section 15126.6 requirements. The potentially significant impacts of the project are described in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, of the EIR and include visual quality. The project would result in a substantial change in visual quality at Frederick Allen Park during tree growth and establishment.

Furthermore, the project would have the potential to result in additional significant impacts on aesthetics, air quality, biological resources, cultural resources, geology and soils, hydrology and water quality, noise, recreation, and transportation, but these impacts would be reduced to less than significant after implementing mitigation. The analysis in Chapter 3 of the EIR show that project impacts on visual quality would be significant and unavoidable, even after incorporating mitigation.

5.2.4 Selecting Alternatives for Analysis in the EIR

Each of the alternatives considered during project planning and preparation of the EIR are identified in Table 5.2-1, showing a summary of each alternative's ability to meet the basic project objectives and feasibility criteria. The alternatives retained for further consideration and analysis and the No Project Alternative are described in Section 5.3. The alternatives eliminated from further consideration are described in Section 5.3, along with the rationale for their elimination.

Table 5.2-1 Alternatives Screening Results

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
Alternatives Retained				
Alternative 1: Reduced Footprint–Avoid Frederick Allen Park Alternative 1 would avoid the concrete channel removal and floodplain construction in Frederick Allen Park. The concrete channel in the park would remain, and four larger fish resting pools would be constructed within the concrete channel adjacent to the park, to improve fish passage within the Frederick Allen Park reach of Unit 3. Alternative 1 would incorporate and would not modify all remaining project elements in Unit 4, including removal of the fish ladder, all project elements in lower Unit 3, and all project elements in Unit 2. *Sources: Town of Ross, scoping comments*	**Yes.** This alternative would meet most project objectives. It would partially meet Objective 1 and would provide flood risk reduction, as demonstrated in the analysis below; however, the flood reduction would be less than the proposed project. It would partially meet Objective 2 because it would improve fish passage, but to a lesser extent than the project, and it would not enhance natural creek processes or include riparian habitat creation. It would partially meet Objective 3 by maintaining the existing public access, but it would not enhance the recreational opportunity. It would partially meet Objective 4 by protecting existing utilities, but it would not improve operational reliability or reduce long-term maintenance of the concrete channel. It would meet Objectives 5 and 6 because it would comply with relevant laws and regulations and could be accomplished with local and reasonably foreseeable grant funding.	**Yes.** This alternative meets the feasibility criteria. It would include installation of four fish pools that would be like other fish pools that would be installed as part of the project. It would be technically feasible to construct, like the fish pools that would be constructed in lower Unit 3. With the additional fish pools in the concrete channel, this alternative still would achieve fish passage improvement, although the improvement would be less than that of the proposed project. Therefore, the alternative would meet regulatory feasibility criteria. It would avoid land uses with legal protection, which would make it legally feasible. The alternative would be less costly than the proposed project and would meet economic feasibility criteria.	**Yes.** This alternative would avoid the temporary significant impacts on visual quality from removal of trees at Frederick Allen Park. It also would avoid temporary biological, noise, traffic, and recreational impacts by avoiding construction in the park area. It would not result in any increased or new significant environmental impacts, in comparison to the project.	**Retained.** This alternative has been retained for detailed analysis because it would meet most objectives, would be feasible, and would avoid the potentially significant project impacts.
Alternative 2: Boardwalk in Frederick Allen Park Alternative 2 would involve constructing Bike Route 20 on a boardwalk attached to the short new floodwall at the west edge of Frederick Allen Park. The boardwalk bike path would be elevated above the floodplain and would not be subject to increased flooding risk. The alternative would not create new public access to the creek but would include a new maintenance accessway parallel to the creek, to accommodate maintenance of the riparian habitat and floodplain. It would incorporate and would not modify any of the remaining project elements in Unit 4, the floodplain construction, floodwalls, and retaining walls in Frederick Allen Park, and lower Unit 3, and Unit 2. *Sources: District, scoping comments*	**Yes.** This alternative would meet all project objectives. It would meet Objective 1 and provide flood control benefits comparable to the project, because the floodplain at Frederick Allen Park and all remaining project elements still would be constructed. It would meet Objective 2, because it would improve fish passage, enhance natural creek processes, and create riparian habitat comparable to the project. It would meet Objective 3 by maintaining public access and enhancing recreational opportunities, by construction of a new boardwalk and overlook in the riparian and creek habitat. It would meet Objective 4 by protecting existing utilities and increasing operational reliability, comparable to the proposed project. It would meet Objectives 5 and 6, because it would comply with relevant laws and regulations and could be accomplished with local and reasonably foreseeable grant funding.	**Yes.** The boardwalk at Frederick Allen Park would meet all feasibility criteria. The boardwalk adjacent to the floodwall and unpaved maintenance access path would be technically feasible to construct. The alternative still would include the concrete channel removal and creation of natural riparian habitat that would meet regulatory requirements. The pathway adjacent to the floodwall would avoid trees adjacent to the floodwall and would meet Section 408 requirements for tree setback from the floodwall. The alternative would be in Frederick Allen Park and would require Town of Ross approval for construction of the boardwalk on Town property. It would meet legally feasibility criteria, like the proposed project. It would involve construction of a boardwalk multi-use path instead of a paved multi-use path. The difference in cost between the paved path and boardwalk would be minimal, and the alternative would be economically feasible.	**Yes.** This alternative would avoid impacts from increased flooding of the multi-use pathway in Frederick Allen Park, by locating the pathway at a higher elevation above the floodplain. It also would avoid the less-than-significant impacts associated with increased pedestrian access to the creek and would accommodate increased planting in the floodplain, by allowing planting below the boardwalk. It would not result in any increased or new significant environmental impacts, in comparison to the project.	**Retained.** The alternative has been retained for detailed analysis because it would meet all project objectives, would be feasible, and would avoid project impacts.
Alternative 3: Reduced Concrete and Increased Natural Materials Alternative 3 would reduce the use of concrete in the project by implementing the following modifications: 1. Replacement of the concrete transition from Unit 4 to Frederick Allen Park with large rock to protect the Ross Valley Sanitary District (RVSD) pipeline.	**Yes.** This alternative would meet all project objectives. It would meet Objective 1 and provide flood control benefits comparable to the project because all project elements would be constructed; however, some of the elements would be constructed with materials other than concrete. It would meet Objective 2 because it would improve fish passage, enhance natural creek processes, and create riparian habitat comparable to the project. It would meet Objective 3 by maintaining public access and enhancing recreational opportunities comparable to the project. It	**Yes.** Preliminary analysis indicates this alternative would meet all feasibility criteria. Use of non-concrete retaining walls and non-concrete protection for buried pipelines has been feasible in other locations. Additional engineering would be required to determine the feasibility of the alternative elements in the project setting. The alternative presumably would meet regulatory feasibility criteria because the riparian corridor and fish passage improvements associated with the project still would remain. USACE may determine	**Yes.** This alternative would not avoid impacts from use of concrete in Corte Madera Creek and the floodplain. The alternative would not be likely to result in any new or increased significant impacts and could result in long-term benefits for fish and wildlife, resulting from reduced concrete and increased use of natural materials.	**Retained.** This alternative has been retained for detailed analysis because it would meet most project objectives, would be feasible, and would not result in any increase in environmental impacts.

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
2. Construction of the retaining walls in Unit 4 and Unit 3 with rock or a material that would allow planting within the retaining walls. 3. Construction of the Unit 2 floodwall with rock instead of concrete. The alternative would not remove any elements of the project but would involve only replacing certain concrete elements with other materials. *Sources: District, scoping comments*	would meet Objective 4 by meeting the engineering criteria for protection of the RVSD sewer line. The operational reliability of the non-concrete elements has not been determined. The alternative would meet Objectives 5 and 6 because it would comply with relevant laws and regulations and could be accomplished with local and reasonably foreseeable grant funding.	that the non-concrete floodwall in Unit 2 is not a floodwall; however, this would be subject to additional evaluation. The alternative elements would be implemented on District property and would meet legal feasibility requirements. The alternative presumably would be similar in cost to the proposed project and would meet economic feasibility criteria.		
Alternatives Eliminated				
Alternative A: Top-of-Bank Floodwall Alternative A would construct top-of-bank floodwalls along the length of the creek in the project area. Setback floodwalls would be constructed around Kent Middle School athletic fields. *Source: 2018 EIS/EIR*	**Yes.** This alternative would meet most project objectives. It would partially meet Objective 3 by maintaining recreational access, but it would not include improvements to enhance the recreational experience in the creek corridor. Objective 6 would require achieving flood risk reduction using currently available local and reasonably foreseeable grant funding. The alternative could not be accomplished using existing and foreseeable funding because of the necessary real estate acquisitions.	**No.** This alternative is not feasible because of the time it would take to purchase 30 parcels and relocate residents living on purchased parcels. The project schedule could not accommodate the real estate acquisition duration. The project would not be legally feasible. In addition, USACE estimated that the cost to implement the alternative would be approximately $200 million, greatly exceeding the $14 million in funding that would be available for the project and not meeting economic feasibility criteria. Because parcels would require acquisition by the District, it may be legally infeasible to implement this alternative.	**No.** This alternative would have significant and unavoidable impacts on water quality, biological resources, aesthetics, noise, and land use. It would have substantially more impact than the project because of the additional activities upstream from Lagunitas Creek and downstream from Kent Middle School.	**Rejected.** The alternative would not meet legal and economic feasibility criteria and would not reduce environmental effects.
Alternative B: Top-of-Bank Floodwall/Partial Sylvan Lane Setback/College of Marin Widening Alternative B would replace the concrete channel lining around the College of Marin and Kent Middle School with an earthen channel, and box culverts would be installed under College Avenue. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy most project objectives. It would partially meet Objective 3 by maintaining recreational access, but it would not include improvements to enhance the recreational experience in the creek corridor. Objective 6 would require achieving flood risk reduction using currently available local and reasonably foreseeable grant funding. The alternative could not be accomplished using existing and foreseeable funding because of the need for substantial real estate acquisition, additional construction, and associated expense.	**No.** This alternative would not be feasible because of the time and cost it would take to purchase 18 parcels and relocate residents living on purchased parcels. USACE estimated the cost to implement this alternative would be $172.5 million, greatly exceeding the $14 million available to construct the project, and thus the alternative would not meet the economic feasibility criteria. Because the District does not own the land where the project would be located and substantial property acquisition would be required, the project also would not meet legal feasibility criteria.	**No.** This alternative would have significant and unavoidable impacts on water quality, biological resources, aesthetics, noise, and land use. It would have substantially more impact than the project because of the additional activities upstream from Lagunitas Creek and downstream from Kent Middle School.	**Rejected.** The alternative would not meet legal and economic feasibility criteria and would not reduce environmental effects.
Alternative C: Top-of-Bank Floodwall/Full Sylvan Lane Setback/College of Marin Widening Alternative C would construct a combination of top-of-bank and setback floodwalls. It would involve creek widening, a lowered bike path, and selected setback barriers at the College of Marin. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy most project objectives. It would meet or partially meet Objectives 1 through 5. It would not meet Objective 6, which would require achieving the project using currently available local and reasonably foreseeable grant funding. It could not be accomplished using existing and foreseeable funding because of the necessary real estate acquisitions and substantial additional construction expense.	**No.** This alternative would not be feasible because of the time it would take to purchase 18 parcels and relocate residents living on purchased parcels. It would not be legally feasible to acquire the 18 parcels within the project time frame. The alternative cost would be similar to Alternative B ($173 million), greatly exceeding the available funding, and in fact would be more expensive than Alternative B. Implementing the project with the funding that would be available for Phase I would not be economically feasible.	**No.** This alternative would have significant and unavoidable impacts on water quality, biological resources, aesthetics, noise, and land use. It would have substantially more impact than the project because of the additional activities upstream from Lagunitas Creek and downstream from Kent Middle School.	**Rejected.** The alternative would not meet legal or economic feasibility criteria and would not reduce environmental effects.

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
Alternative F: Underpass/Allen Park Riparian Corridor/College of Marin Widening Alternative F would construct top-of-bank and setback floodwalls (maximum height of 9 feet) and an underpass under Sir Francis Drake Boulevard. It would make improvements to a recreation path in Frederick Allen Park. It would replace a concrete lining with an earthen channel in Unit 3 at the College of Marin. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy most project objectives. It would not meet Objective 6, which would require achieving the project using currently available local and reasonably foreseeable grant funding. It would exceed the funding available because it would include a substantial increase in construction to replace the concrete channel in Unit 3 at the College of Marin and add the underpass under Sir Francis Drake Boulevard.	**No**. This alternative would not be feasible because of the substantial funding required to construct the underpass under Sir Francis Drake Boulevard and remove the concrete channel in Unit 3 at the College of Marin, in addition to the project construction at Frederick Allen Park. The cost for this alternative would range from $37 million to $56 million, which would exceed the $14 million available for project construction.	**No.** This alternative would have significant and unavoidable impacts on water quality, noise, and traffic. It would have substantially more impact than the project because of the additional activities under Sir Francis Drake Boulevard and at the College of Marin.	**Rejected.** The alternative would not meet economic feasibility criteria and would not reduce environmental effects.
Alternative G: Floodwall/Allen Park Riparian Corridor/College of Marin Widening Alternative G would construct top-of-bank floodwalls (maximum height of 6 feet), make improvements to the recreation path in Frederick Allen Park, and replace the concrete lining with an earthen channel in Unit 3 at College of Marin. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy most project objectives. It would not meet Objective 6, which would require achieving flood risk reduction using currently available local and reasonably foreseeable grant funding. The alternative could not be accomplished using existing and foreseeable funding.	**No.** This alternative would not be feasible because of the time it would take to purchase 18 parcels and relocate residents living on purchased parcels. The acquisition of 18 parcels would not be legally feasible within the project's time frame. USACE estimates that the cost of this alternative would be $173 million, greatly exceeding the $14 million available for project construction. The alternative would not meet the economic feasibility criteria.	**No.** This alternative would have significant and unavoidable impacts on water quality, biological resources, aesthetics, noise, and land use. It would have substantially more impact than the project because of the additional activities at the College of Marin and related to acquisition of the 18 property parcels.	**Rejected.** The alternative would not meet legal or economic feasibility criteria and would not reduce environmental effects.
Alternative J: Underpass/Allen Park Riparian Corridor/Floodwall Alternative J would construct an underpass under Sir Francis Drake Boulevard and floodwalls in Frederick Allen Park near the Granton Park neighborhood, adjacent to College Avenue. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy five of the six project objectives. It would not meet Objective 6, which would require achieving flood risk reduction using currently available local and reasonably foreseeable grant funding. The alternative could not be accomplished using existing and foreseeable funding.	**No.** This alternative would result in additional cost to construct the underpass under Sir Francis Drake Boulevard in addition to all other proposed project elements. The additional cost of underpass construction to the proposed project elements would exceed the $14 million available for project construction. The alternative would not meet economic feasibility criteria.	**No.** This alternative would increase noise and traffic impacts because of construction of the underpass under Sir Francis Drake Boulevard. It would have substantially more impact than the project because of the additional activities under Sir Francis Drake Boulevard.	**Rejected.** The alternative would not meet economic feasibility criteria and would not reduce environmental effects.
Fish Ladder Removal Only This alternative would remove only the fish ladder in Unit 4 and would include no other proposed project elements. This alternative is similar to Alternative 1 in that Alternative 1 does not modify Frederick Allen Park. This alternative differs from Alternative 1 because Alternative 1 includes proposed flood control and habitat elements in Unit 4 and Kentfield areas. Alternative 1 also includes 4 larger fish pools in the existing concrete channel adjacent to Frederick Allen Park. *Source: scoping comments*	**No.** This alternative would not meet most project objectives. Removal of the fish ladder in the absence of all other project components would not meet Objective 1, because the floodwalls in Units 2 and 3 and the stormwater pump station would not be constructed. Flooding in Kentfield would continue and would be worsened by the alternative. The alternative would not improve fish passage and would not meet Objective 2 because none of the fish resting pools would be constructed, and the gap in fish passage in the concrete channel would remain. The alternative would retain existing public access and would partially meet Objective 3 for public access. It would leave the RVSD pipeline at risk and would not provide adequate transition between Unit 3 and Unit 4; therefore, it could undermine the integrity of the existing concrete channel and would not meet Objective 4. It would not meet Objective 5 because it would not comply with the regulatory criteria, it would affect the stability of the USACE flood control	**No**. This alternative would not be technically feasible because removal of the fish ladder in the absence of other hydrologic modifications would create hydrologic instability in Corte Madera Creek and could cause scour at the transition to the concrete channel. USACE would not approve removal of the fish ladder in the absence of a transition to Unit 3. Natural resource agencies would not approve the fish ladder removal in the absence of other fish passage and habitat improvements; therefore, the alternative would not meet regulatory requirements. The alternative could be completed with the available funds, would occur on District-owned land, and could meet economic and legal feasibility criteria.	**No.** This alternative would result in significant hydrologic impacts because it would not provide protection for Kentfield, leading to increased flooding in Units 3 and 2. It also would cause increased scour and hydrologic impacts on the transition to Unit 3, which would cause significant utility impacts. Although the alternative would avoid the project impacts on visual quality and recreational opportunity, it would result in long-term significant impacts on flooding and hydrology.	**Rejected.** This alternative would not meet most project objectives, would not meet regulatory requirements, and would result in a significant increase in hydrologic effects that would outweigh the benefits of the alternative.

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
	channel, and it would not provide any improvement to fish passage or riparian habitat. The alternative would meet Objective 6 because it could be accomplished with the available funding.			
All Fish Resting Pools Improvement This alternative would include improving all 28 resting pools to address fish passage in Unit 3. It would replace the proposed project construction of 11 fish resting pools in Unit 3 but would not modify any other project elements. *Source: CDFW scoping comment*	**Yes.** This alternative would meet the proposed project objectives. The additional fish pools would provide fish resting habitat, comparable to the fish pools proposed as part of the project. The alternative would not meet Objective 6 because it could not be accomplished with currently available local or reasonably foreseeable funding.	**No.** Construction of larger fish pools in the concrete channel would be technically and legally feasible and would be part of the project. The alternative is expected to meet regulatory requirements and was suggested by CDFW. The cost of enlargement of 28 fish pools in Unit 3 (more than double the number proposed) would exceed the funding available for construction of fish resting pools and would not meet economic feasibility criteria.	**No.** This alternative would not avoid or reduce any project impacts and would not increase benefits for fish passage. The proposed fish passage resting pools were selected optimally to provide improvement to fish passage in Corte Madera Creek based on the 2020 study and evaluation prepared by Mike Love & Associates. The additional fish pools would result in additional construction impacts on hydrology in Corte Madera Creek and would lengthen the construction schedule.	**Rejected.** This alternative would not be economically feasible and would increase environmental effects.
Concrete Channel Removal in Units 2 and 3 This alternative would remove the concrete channel in Units 2 and 3 and would minimize floodwall construction that could result in permanent loss of riparian vegetation. The alternative would maximize concrete removal and channel naturalization. *Source: RWQCB comments on 2018 Draft EIS/EIR; scoping comments*	**Yes.** The alternative potentially meets most project objectives. As part of the alternative, additional design would be required to evaluate approaches to address flood control and incorporate recreational access along the multi-use pathway in Units 2 and 3. The alternative would not meet Objective 6 because it could not be accomplished with currently available local or reasonably foreseeable funding.	**No.** Removing the concrete channel may be technically feasible but would require further design. Removing the additional concrete in Units 2 and 3 presumably would meet regulatory requirements and legal feasibility criteria. The alternative would require substantially more funding than currently is available to the District, and it would not meet economic feasibility criteria. The alternative is considered as a separate and cumulative project in Chapter 4. The alternative could be implemented as a separate project in the future if sufficient funding to implement the alternative becomes available.	**No.** This alternative would not avoid or reduce any significant project impacts. It would involve concrete removal in new areas and would result in potentially significant impacts associated with construction in new areas. Additional environmental documentation would be needed before additional concrete channel removal in the lower Unit 3.	**Rejected**. This alternative would not be economically feasible and could not be accomplished within the project schedule. The alternative would also result in greater environmental impacts and would reduce impacts of the proposed project.
Sylvan Lane Flood Reduction–Winship Bridge to Lagunitas Bridge This alternative would include flood risk reduction in the Sylvan Lane area through flood control actions in the Winship Bridge to Lagunitas Bridge area of Corte Madera Creek. *Source: scoping comments*	**Yes.** This alternative would include project elements of the proposed project to meet Objectives 1 through 5. The alternative would add additional project elements upstream from Lagunitas Bridge, which could not be implemented with the available grant funding. It would not meet Objective 6 because it could not be accomplished with reasonably foreseeable grant funding.	**No.** This alternative would be potentially technically feasible but likely would require elements similar to the project, which would not be feasible (as discussed above). The alternative would not meet economic feasibility criteria because it would exceed available funding to add major elements to the proposed project. A separate project may be feasible in the future to address flooding in this area.	**No.** This alternative would require additional elements in other areas, which would not avoid or reduce the proposed project impacts and would result in greater impacts in new areas.	**Rejected.** This alternative would not meet economic feasibility criteria and would not reduce any environmental effects.
Buffer between the Retaining Walls and Corte Madera Creek in Frederick Allen Park This alternative either would remove the retaining walls at Frederick Allen Park or would set the retaining walls back from the creek to allow increased riparian plantings along the creek. *Source: CDFW scoping comment*	**No.** This alternative would not meet Objective 1 for flood risk reduction because a retaining wall would be required to provide flood protection for properties surrounding the project area. It would not meet Objective 3 for maintaining recreational access because moving the retaining wall would require removal of the bike path; the retaining wall is proposed in areas where the creek is adjacent to the bike path. It would not meet Objective 4 because it would not protect utilities that would be protected by the retaining wall and would not ensure operational reliability because the retaining wall is proposed to protect the creek at the transition from Unit 4 to Unit 3. In the absence of a retaining wall, the channel would be subject to	**No.** This alternative would not be technically feasible because the retaining wall would be required to protect existing infrastructure. If the retaining wall was removed, the infrastructure (including the bike path and adjacent structures) would not be sufficiently protected from the creek. Setting back the floodwall would require acquisition of residential and commercial properties, the cost of which would substantially exceed the available funding. Thus, the alternative would not be economically feasible.	**No.** This alternative would result in increased hydrologic impacts by removing the retaining wall, which would be needed for creek stability. It would not reduce any significant project impacts.	**Rejected.** This alternative would not meet the project objectives, would not be technically, legally, or economically feasible, and would result in increased flooding impacts without reducing any environmental effects.

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
	substantial erosion at the transition. It also would not meet the objective for completing the project with available funding because relocating the retaining wall likely would require additional real estate acquisition of nearby properties.			
Stormwater Drainage under Kent Avenue This alternative would add stormwater drainage under Kent Avenue. *Source: scoping comments*	**Yes.** This alternative, in combination with the proposed project, would meet Objectives 1 through 5. The alternative would not meet Objective 6 because it would require additional elements that could not be accomplished with reasonably foreseeable grant funding.	**No.** This alternative is potentially technically feasible and could meet regulatory requirements and legal feasibility criteria. The alternative would require additional construction. Because this was suggested as an additional element that would be added to all other project elements, it would not be feasible to complete this work within the project budget and because the alternative was suggested as an addition, it is not an alternative to the project. Therefore, this alternative would not be economically feasible.	**No.** This alternative would result in new impacts along Kent Avenue and would not reduce any proposed project impacts because it would not avoid or replace any portion of the project.	**Rejected.** This alternative would not meet economic feasibility criteria and would not reduce environmental effects.

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5.3 Alternatives Selected for Analysis in the EIR

The alternatives selected for analysis in this EIR are:

1. No Project Alternative
2. Alternative 1: Reduced Footprint–Avoid Frederick Allen Park
3. Alternative 2: Boardwalk in Frederick Allen Park
4. Alternative 3: Reduced Concrete and Increased Natural Materials

To evaluate the various alternatives, the impacts of the proposed project within the "area of comparison" were compared to the impacts of the alternative, as described next, and summarized in Table 5.3-1, below. The "area of comparison" reflects the area of the proposed project that would be replaced by the alternative. The impacts of the proposed project would remain outside the area of comparison. The information contained in this Draft EIR will be reviewed and considered by the District Board of Supervisors before deciding to approve, disapprove, or modify the proposed project. As part of its deliberations, the Board of Supervisors will decide whether to approve all or part of the proposed project. The Board of Supervisors may adopt one or more of the alternatives, or parts of the alternatives described in this section, in lieu of the proposed project.

Table 5.3-1 Alternatives Areas of Comparison

Alternative	Proposed Project Area of Comparison	Difference from Proposed Project
Alternative 1: Reduced Footprint – Avoid Frederick Allen Park	• Construction in Corte Madera Creek and Frederick Allen Park between Unit 4 and Town of Ross jurisdictional limits • Limits of flooding upstream and downstream	• No modifications to Frederick Allen Park and Pathway • Four additional fish pools in the existing concrete channel • Modified transition from Unit 4 to Unit 3
Alternative 2: Boardwalk in Frederick Allen Park	• Bike Route 20 in Frederick Allen Park • Maintenance access at Frederick Allen Park	• Raised and realigned Bike Route 20 boardwalk path • No pedestrian creek access • New maintenance access parallel to creek
Alternative 3: Reduced Concrete and Increased Natural Materials	• Concrete in Corte Madera Creek at Unit 3 transition • Concrete retaining walls in Frederick Allen Park and Unit 4 • Concrete floodwall in Unit 2	• Non-concrete retaining walls in Unit 4 and Unit 3 • Non-concrete transition between Unit 3 and Unit 4 • Non-concrete floodwall in Unit 2

5.3.1 No Project Alternative

The CEQA Guidelines require an EIR to include an evaluation of the No Project Alternative, to provide decision-makers with the information necessary to compare the relative impacts of approving the project, or an alternative, and not approving the project (CEQA Guidelines Section 15126.6[e]). The No Project Alternative is defined as a continuation of existing conditions, as well as conditions that are reasonably expected to occur if the project is not implemented. The following discussion describes this alternative.

Description

The No Project Alternative represents the expected future condition if none of the action alternatives are approved and no change occurs in the current channel configuration. For the No Project Alternative, the current conditions and flood capacity would remain unchanged. The capacity ranges from 3,630 cubic feet per second (cfs) at Lagunitas Road Bridge in Unit 4 to greater than 6,900 cfs downstream of Unit 2 (USACE, 2010; Stetson Engineers, 2017). Under these existing conditions, flood flows exceeding these capacities would continue to pass outside the channel, onto the floodplain, and would continue to flood residential and commercial areas The Denil fish ladder would not be replaced, and fish passage would not be improved through Corte Madera Creek. Over time, the fish ladder likely would continue to degrade. Moreover, the transition point between the natural Unit 4 and concrete-lined Unit 3 stream reaches would remain a constricted section or a flood flow breakout zone. In Unit 2, the concrete channel below Stadium Way would remain, and marsh habitat that is resilient to climate change would not be established.

Environmental Impacts

The No Project Alternative would include maintaining the existing creek condition; baseline conditions would be maintained in the project area, and no new environmental impacts would be introduced. The cumulative flood control projects upstream from the project area still would occur. No improvement to fish passage, natural creek processes, or habitat would occur, nor would improvements to recreational facilities occur in the project area.

Aesthetics and Visual Resources

Implementation of the No Project Alternative would not affect the visual character of the project area because it would remain in its current condition. Views along Bike Path 20 in Frederick Allen Park and along Corte Madera Creek would remain unchanged. No impact would occur on aesthetics or visual resources.

The No Project Alternative would avoid the project's potentially significant impacts on visual quality from tree and vegetation removal and grading in Frederick Allen Park and the less--than-significant impact from the floodwalls and stormwater pump station in lower Unit 3 and Unit 2. The No Project Alternative also would not achieve the long-term benefit to aesthetics from creation of natural riparian habitats and a natural stream channel in Frederick Allen Park.

Air Quality
The No Project Alternative would not require vehicle or equipment use beyond the existing maintenance of the Corte Madera Creek channel. Criteria air pollutant emissions would not increase, and the risk to sensitive receptors would remain the same as baseline conditions. The ambient air quality of the project site would not be affected by the No Project Alternative. The No Project Alternative would avoid the air quality impacts resulting from project construction. The No Project Alternative would result in less than significant air quality impacts resulting from operation and maintenance of existing facilities, like operational impacts of the proposed project.

Biological Resources
The No Project Alternative would not require construction-related, ground-disturbing activities and would not affect special-status species that may occur in the project area. No impact would occur on existing jurisdictional waters or riparian habitat. The No Project Alternative could result in tree removal if USACE requires tree removal within 15 feet of the creek, which could result in an impact on existing trees and habitat.

The No Project Alternative would avoid the proposed projects' temporary construction impacts on special-status species, invasive species, riparian and sensitive habitats, and wetlands. The No Project Alternative also would reduce the amount of tree removal required, particularly in Frederick Allen Park.

The No Project Alternative would not modify the existing concrete channel, and the existing fish passage barriers and conditions would remain. The restoration of riparian and marsh habitat included in the proposed project would not occur under the No Project Alternative. The No Project Alternative would not achieve the long-term project benefits for fish passage, riparian habitat, and wetlands. The existing degraded habitat conditions in the project area would remain.

Cultural Resources
The No Project Alternative would not involve ground-disturbing activities, and thus no impacts would occur on archaeological resources or human remains. Furthermore, no impact would occur on cultural resources. The No Project Alternative would avoid the potential project impacts from inadvertent discovery and impact on cultural resources during project construction.

Energy
The No Project Alternative would not require the use of energy (fuel) resources for project construction. The No Project Alternative would avoid energy use from the stormwater pump station because no stormwater pump station would be constructed. The ongoing maintenance of the existing floodwalls and existing creek condition in the project area would require minimal energy resources, consistent with existing conditions. The No Project Alternative would avoid the proposed project's less-than-significant impact on consumption of energy resources during construction.

Geology and Soils

The No Project Alternative would not involve floodwall installation, concrete removal in Corte Madera Creek, or modifications to Frederick Allen Park, and would not expose structures or property to adverse effects from rupture of an earthquake fault, strong seismic ground shaking, seismic-related ground failure, liquefaction, landslides, or expansive or unstable soil. The No Project Alternative would not involve ground-disturbing activities that would result in loss of topsoil, but could involve tree removal, as stipulated by USACE. Soil erosion would continue at baseline conditions in the creek channel within Unit 4. No geologic, soils, or seismicity impacts would occur with the No Project Alternative. The No Project Alternative would not involve ground disturbance that could affect paleontological resources.

The No Project Alternative would avoid the proposed project's less-than-significant impacts related to geologic and seismic events, loss of topsoil and erosion, unstable geologic units, and expansive soils. The No Project Alternative would avoid the proposed project's less-than-significant impact on paleontological resources.

Under the No Project Alternative, the new streambank stabilization structures in Unit 4, riparian planting and streambank stabilization in Frederick Allen Park and salt marsh habitat in Unit 2 would not occur. The long-term improvements in streambank stabilization and structural reliability from the proposed project would not be achieved. The existing seismic risks to the concrete channel and erosion risks would remain.

Greenhouse Gas Emissions

The No Project Alternative would not involve floodwall installation, concrete removal in Corte Madera Creek, or modifications to Frederick Allen Park, and no construction-related greenhouse gas (GHG) emissions would be generated. Operational GHG emissions would occur from maintenance of existing facilities at the same rate as existing conditions.

The No Project Alternative would avoid the proposed project's impact on GHG resulting from use of off-road construction equipment and vehicles during project construction and would avoid GHG emissions from operation of the emergency generator and energy use at the stormwater pump station. The No Project Alternative would have minimal greenhouse gas emissions during maintenance of existing facilities, like the proposed project. However, the No Project Alternative would not involve creation of natural riparian habitat and would not create the greenhouse gas emission reduction benefits of the proposed project.

Hazards and Hazardous Materials

The No Project Alternative would not involve transportation or use of hazardous materials related to construction equipment use and would not emit hazardous emissions, resulting from construction, within 0.25 mile of an existing or proposed school. The No Project Alternative would not involve construction activities that could interfere with emergency response plans. Maintenance of the existing flood control channel under the No Project Alternative would involve limited quantities of hazardous materials.

The No Project Alternative would avoid the proposed project's less-than-significant impacts related to transportation and use of hazardous materials, emission of hazardous materials, and interference with emergency plans. The No Project Alternative would have less-than-significant impacts related to hazardous materials' use during operation and maintenance of existing facilities, like to the proposed project.

Hydrology and Water Quality

The No Project Alternative would not involve ground-disturbing activities that would result in impacts on hydrology and water quality or construction activities that could result in the risk of pollutant release because of inundation. The No Project Alternative would not use groundwater, alter the existing drainage pattern of the project area, or change the amount of surface water or flow of water in Corte Madera Creek. Under the No Project Alternative, the destructive flooding that has occurred historically at Corte Madera Creek would continue to occur and would expose people and property to flooding and other water-related hazards. The cumulative flood control projects would provide some reduction in flooding in the town of Ross, but the ongoing flooding consequences in the Town of Ross and Kentfield area generally would remain.

The No Project Alternative would avoid the proposed project's potential water quality impacts from disturbance of potentially contaminated soils during construction. The No Project Alternative would avoid the minimal proposed project impact from increased flooding in the parking lot and field near the College of Marin Avenue. The No Project Alternative would not achieve the widespread proposed project benefits from reduction in flooding throughout the Town of Ross and Kentfield areas.

Noise

Under the No Project Alternative, project construction, including floodwalls, Frederick Allen Park modifications, and concrete channel removal, would not occur, and ambient noise levels in the project area would remain the same as existing conditions. The No Project Alternative would not result in changes to the ambient noise levels or cause vibration impacts.

The No Project Alternative would avoid the proposed project's potentially significant impacts related to an increase in ambient noise and groundborne vibration during construction. The noise impacts from maintenance of the channel would be less than significant and would be like the proposed project.

Public Services

The No Project Alternative would not cause a need for new or altered government facilities, including fire protection, police protection, schools, and parks. The No Project Alternative would not involve construction of proposed project components that could increase the need for fire or police services, and the alternative would not induce population growth and would not increase the need for new schools. The No Project Alternative would require maintenance of Corte Madera Creek, similar to existing conditions.

The No Project Alternative would avoid the proposed project's less-than-significant impacts on public services. The No Project Alternative would not achieve project benefits from improvements in stormwater drainage in the Kentfield Area, and the existing potential flooding impacts would remain.

Recreation

The No Project Alternative would not involve construction closures of Fredrick Allen Park, Bike Route 20, or the unnamed unofficial paths. The alternative would not include modifications to Frederick Allen Park or construction of an informal recreational path segment within Unit 2. The No Project Alternative would not increase the use of existing parks, include new recreational facilities, or affect existing recreational opportunities.

The No Project Alternative would avoid the proposed project impacts from increased flooding of the multi-use pathway in Frederick Allen Park and temporary loss of shade. The No Project Alternative also would avoid the less-than-significant impacts from a new access to the creek. The No Project Alternative would not have a beneficial impact on the recreational experience in Fredrick Allen Park, resulting from opportunities afforded through increased creek and habitat viewing.

Transportation and Circulation

Under the No Project Alternative, no construction-related transportation and traffic impacts would occur. Nearby roadways would not be used for construction-related traffic, and existing roads and/or recreational paths would not be used for access roads. The No Project Alternative would involve minimal vehicle miles traveled for maintenance of the existing flood control channel.

The No Project Alternative would avoid the proposed project's potentially significant, construction-related impacts on transportation and traffic, resulting from temporary closure of Bike Route 20 in Frederick Allen Park. The No Project Alternative would have a less-than-significant impact on transportation and circulation from vehicle miles traveled to maintain the flood control channel.

Tribal Cultural Resources

The No Project Alternative would not involve ground-disturbing activities, and no potential impacts on tribal cultural resources would occur. The No Project Alternative would avoid the proposed project's potential for inadvertent discovery of tribal cultural resources.

Utilities and Service Systems

The No Project Alternative would not require or result in relocation or construction of new water conveyance, wastewater treatment, and stormwater drainage, or the addition of electric power, natural gas, or telecommunications facilities. The No Project Alternative would not require water supplies because no project construction or operation would occur. Under the No Project Alternative, no wastewater or solid waste would be generated greater than existing conditions. The No Project Alternative would avoid the proposed project's less-than-significant impacts related to relocation or construction of water conveyance, wastewater treatment, and

stormwater drainage; the addition of electric power, natural gas, or telecommunications facilities; additional water supply; or wastewater and solid waste generation.

Agriculture and Forestry, Land Use and Planning, Mineral Resources, Population and Housing, Socioeconomics, and Wildfire
The No Project Alternative would not involve impacts on lands containing agricultural or forestry resources or mineral resources. The No Project Alternative would not involve changes in land use or character of the community and would not conflict with the Town of Ross General Plan, Kentfield General Plan, or Marin Countywide Plan. The No Project Alternative would not induce unplanned population growth, and planned growth would continue as under existing conditions. The No Project Alternative would not involve any activities in areas that are very high fire hazard areas. The No Project Alternative would avoid the proposed project's less-than-significant impacts related to dividing an established community and unplanned population growth.

No Project Alternative Summary and Ability to Meet Objectives

Selection of the No Project Alternative would avoid the environmental impacts of the proposed project because no floodwalls, modifications to Frederick Allen Park, or concrete channel removal would occur. The baseline environmental conditions of the project area would remain under the No Project Alternative, including ongoing flooding consequences from Corte Madera Creek. The No Project Alternative would not meet any of the proposed project objectives.

5.3.2 Alternative 1: Reduced Footprint–Avoid Frederick Allen Park

Description

Alternative 1 would reduce the project footprint/area of disturbance by avoiding construction in Frederick Allen Park. The concrete channel would remain adjacent to Frederick Allen Park, and no construction would occur in the park. To meet the regulatory requirements and objectives for fish passage, four large fish pools would be constructed within the existing concrete channel adjacent to Frederick Allen Park, in addition to the large fish pools that are proposed as part of the project downstream in Unit 3. The fish ladder at the upstream end of Frederick Allen Park would still be removed in Alternative 1. No other modifications would occur to the concrete channel adjacent to Frederick Allen Park. Alternative 1 would include all proposed project elements as described in Chapter 2, except for the Frederick Allen Park enhancements in the Town of Ross. The Alternative 1 avoidance area and fish pools are shown in Figure 5.3-1.

Work within Unit 4, lower Unit 3, and Unit 2, including removal of the fish ladder, would be the same as the proposed project. Therefore, the following analysis focuses on construction impacts resulting from the four additional fish pools in Corte Madera Creek adjacent to Frederick Allen Park and avoidance of project modifications in Frederick Allen Park.

Figure 5.3-1 Alternative 1: Reduced Footprint–Avoid Frederick Allen Park

Source: (GHD, 2020)

Environmental Impacts

Aesthetics and Visual Resources

Alternative 1 Impacts

Alternative 1 would include four additional fish pools in the concrete channel in upper Unit 3. The addition of the fish pools would have no impact on scenic vistas because they would not be visible from publicly accessible scenic vistas. The fish pools would have a less-than-significant impact on the visual character of the project area because the Alternative 1 fish pools would be below grade in the concrete channel and would appear visually similar to existing fish pools in the channel. Alternative 1 would not conflict with adopted visual policies or standards and would not involve temporary construction lighting or permanent lighting.

Comparison of Impacts to the Proposed Project

Alternative 1 would avoid the proposed project's significant and unavoidable impact on visual quality in Frederick Allen Park immediately following construction and up to 10 years, while the proposed project landscaping matures. Alternative 1 would not achieve the long-term benefits to visual quality from establishment of a natural riparian corridor and stream channel with viewing opportunities. Alternative 1 would result in reduced impacts on visual quality, but also reduced benefits.

Air Quality

Alternative 1 Impacts

Alternative 1 would involve use of construction equipment and vehicles that would result in temporary construction emissions. The alternative would not require disturbance of soil and would not require mitigation. Construction of Alternative 1 in combination with the proposed project in Unit 4, lower Unit 3, and Unit 2 would result in exposure of nearby residents to toxic air contaminants in excess of thresholds set by the Bay Area Air Quality Management District (BAAQMD), as shown in Table 5.3-2. The District would implement Mitigation Measure 3.2-3, which would require use of U.S. Environmental Protection Agency (USEPA) or California Air Resources Board (CARB) Tier 3 off-road equipment. The impact would be less than significant with mitigation incorporated, as shown in Table 5.3-3. Maintenance of the four fish pools would not result in any increase in air quality emissions over existing conditions.

Comparison of Impacts to the Proposed Project

Alternative 1 would use the same types of construction equipment as the proposed project. Alternative 1 would require approximately 2 weeks for construction of the four fish pools but would not include the 105 days of construction in Frederick Allen Park. The duration of construction would be less than the proposed project and would result in decreased constructed-related emissions. Air quality impacts from maintenance of Alternative 1 would be comparable to the proposed project. Alternative 1 would result in a decrease in construction-related emissions and air quality impacts, compared to the proposed project.

Table 5.3-2 Alternative 1 Estimated Unmitigated Construction Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally Exposed Individual Receptor[a]	15.9	0.037	0.17[b]	0.11
BAAQMD Significance Thresholds	10.0	1.0	1.0	0.30
Threshold Exceeded?	**Yes**	No	No	No

Notes:

[a] This receptor location is where the maximum health risk would occur based on modeling. No real-world sensitive receptors occur at this location.

[b] The maximally exposed individual receptor is a different location for the acute hazard index.

Table 5.3-3 Alternative 1 Estimated Mitigated Construction Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally Exposed Individual Receptor[a]	4.3	0.01	0.17[b]	0.03
BAAQMD Significance Thresholds	10.0	1.0	1.0	0.30
Threshold Exceeded?	No	No	No	No

Notes:

[a] This receptor location is where the maximum health risk would occur based on modeling. No real-world sensitive receptors occur at this location.

[b] The maximally exposed individual receptor is a different location for the acute hazard index.

Biological Resources

Alternative 1 Impacts

Construction of four fish pools in the concrete flood control channel would result in temporary impacts on aquatic resources, including special-status species, during temporary dewatering. Alternative 1 construction would be conducted between June 15 and October 15, to avoid potential significant impacts on special-status fish. Alternative 1 would have no impact on special-status plants or wildlife. Alternative 1 would have no impact on riparian habitat or sensitive vegetation communities. Alternative 1 would result in a net benefit to fish passage and habitat, by creating deeper and larger fish pools adjacent to Frederick Allen Park and removing the existing fish passage barrier. Alternative 1 would not conflict with any local plans or

ordinances for protection of biological resources and would not conflict with a habitat conservation plan.

Comparison of Impacts to the Proposed Project

Alternative 1 would avoid the proposed project's temporary impacts on special-status wildlife species and temporary impacts from oak tree removal in Frederick Allen Park. Alternative 1 would achieve less benefits to special-status species, fish passage, and creek habitat, and less benefits for wildlife habitat and riparian habitat than the proposed project because Alternative 1 would not create natural creek channel and riparian habitat in Frederick Allen Park. Alternative 1 also would avoid the potential for conflicts with a local tree protection policy because it would not require tree removal in Frederick Allen Park.

Cultural Resources

Alternative 1 Impacts

Alternative 1 would not result in a substantial adverse change in the significance of a historical resource because no historical resource occurs in the vicinity of the Alternative 1 fish pools. Alternative 1 would involve excavation in the existing flood control channel. No archaeological resources or human remains are known to occur beneath the flood control channel in the excavation vicinity. Although a low risk of encountering archaeological resources would exist during Alternative 1 construction, the alternative could result in inadvertent discovery of archaeological resources. The District would implement Mitigation Measure 3.5-2, which specifies procedures to avoid impacts from inadvertent discoveries of archaeological resources. The resulting impact on archaeological resources from Alternative 1 construction would be less than significant with mitigation incorporated. Alternative 1 construction would have a less-than-significant impact from disturbance of human remains, because Alternative 1 would be implemented in compliance with Section 5097.98 of the Public Resources Code and Section 7050.5 of the Health and Safety Code, which specify procedures for handling discoveries of human remains.

Comparison of Impacts to the Proposed Project

Alternative 1 would have a slightly reduced potential to encounter archaeological resources or human remains than the proposed project, because of the reduced area of grading and ground disturbance in Frederick Allen Park. However, both the proposed project and Alternative 1 would have a low potential to encounter archaeological resources or human remains.

Energy

Alternative 1 Impacts

Alternative 1 would require use of energy resources during construction, primarily in the form of petroleum products (i.e., gasoline and diesel) used to operate construction equipment and transport materials/supplies and workers to and from the project area. Fuel use would be temporary and short-term over the approximately 2-week construction duration for the fish pools. Energy impacts from the short-term construction would be less than significant. Maintenance of Alternative 1 would require similar use of energy resources to the existing channel maintenance.

Comparison of Impacts to the Proposed Project

Compared to the proposed project, Alternative 1 would use the same types of construction equipment that require petroleum products, but construction duration and intensity would be less. Maintenance energy resources' use under Alternative 1 would be similar to that of the proposed project. Alternative 1 would have a slightly reduced impact related to energy resources compared to the proposed project because the construction duration would be shorter.

Geology and Soils

Alternative 1 Impacts

Alternative 1 would include construction of project components on similar ground and soil substrate as the proposed project. Alternative 1 would have less-than-significant impacts associated with seismicity and seismic-related events. Alternative 1 would require soil-disturbing activities, including tree and concrete removal, which would result in soil loss. Implementation of the best management practices (BMPs) described in the Stormwater Pollution Prevention Plan (SWPPP) would minimize potential impacts, and impacts related to soil loss and erosion would be less than significant. Alternative 1 would involve installation of four fish pools in upper Unit 3. Based on the initial assessment of the concrete channel downstream, enlarging the fish pools without compromising the structural integrity of the channel would be possible. Alternative 1 would not cause soils or geological conditions to become unstable, and thus the impact would be less than significant. The soil expansion potential is anticipated to be low and paleontological resources are not anticipated in sediments and rocks in the project area. Therefore, the impacts would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would have similar impacts related to seismicity and seismic-related events, expansive soils, paleontological resources, and stability of geologic units as the proposed project. Alternative 1 would not involve ground-disturbing activities or tree removal in Frederick Allen Park and would avoid the potential for soil loss and erosion in Frederick Allen Park associated with the proposed project. Alternative 1 would not include removal of the concrete channel, and the existing risk related to geologic hazards from the concrete channel would remain. Alternative 1 would have a reduced impact on geology and soils when compared to the proposed project.

Greenhouse Gas Emissions

Alternative 1 Impacts

Construction of Alternative 1 would involve off-road construction equipment and vehicles that would result in construction GHG emissions that would be short-term and temporary. Operational GHG emissions would not exceed GHG significance thresholds, and impacts associated with GHG emissions would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would involve the same type of equipment as that used by the proposed project, but the construction schedule would be shorter under Alternative 1 because no construction

would occur in Frederick Allen Park. The number of construction truck trips under this alternative also would be ~~slightly~~ lower than the proposed project because of avoidance of Frederick Allen Park, which would reduce the construction GHG emissions. Operational GHG emissions under Alternative 1 would be ~~the same as~~ greater than the proposed project because Alternative 1 would not remove the concrete channel and would not include as much vegetation in Frederick Allen Park. Temporary GHG emission impacts associated with implementation of Alternative 1 would be less than that of the proposed project, but Alternative 1 would have reduced long-term GHG reduction benefits than the proposed project.

Hazards and Hazardous Materials

Alternative 1 Impacts

Alternative 1 would require use of hazardous materials to operate equipment in construction of the fish pools. Hazardous emissions from Alternative 1 in combination with the remaining project elements are discussed previously under Air Quality. This construction would be more than 0.25 mile from a school. The new fish pools would be within the existing concrete channel and would not interfere with implementation of an emergency response plan. Maintenance of the existing flood control channel and fish pools under Alternative 1 would involve limited quantities of hazardous materials.

Comparison of Impacts to the Proposed Project

Construction of Alternative 1 would have slightly less impact than the proposed project in use of hazardous materials and hazardous emissions, because the alternative would require less construction equipment and would have a shorter construction duration in avoidance of construction in Frederick Allen Park.

Hydrology and Water Quality

Alternative 1 Impacts

Water Quality

Alternative 1 would require excavation of soils within the concrete channel to create large fish pools. The excavation area would be limited, and construction of the large fish pools would not violate any water quality standards. Alternative 1, in combination with the remaining project elements in Unit 4, lower Unit 3, and Unit 2, would result in a slight increase in velocity of approximately 0.4 to 2 feet/secondin areas of the concrete channel in Units 2 and 3, and an increase in velocity greater than 2 feet/second in Unit 4 under the 10-year and 25-year flood events, as shown in Figure 5.3-2 through Figure 5.3-4. The increase in velocity relative to baseline conditions would be less under the 100-year event than under the 10-year and 25-year events. The increase in velocity would be caused by removal of the Denil fish ladder, which would remove a constriction and thereby increase the flow capacity of the channel at the fish ladder location. The increase in velocity of approximately 2 feet/second would not cause a significant increase in erosion because the velocity increase would be minimal and would be concentrated in Unit 4, where the proposed project would incorporate streambank stabilization measures to protect the creek bank from erosion. The impact on erosion would be less than significant.

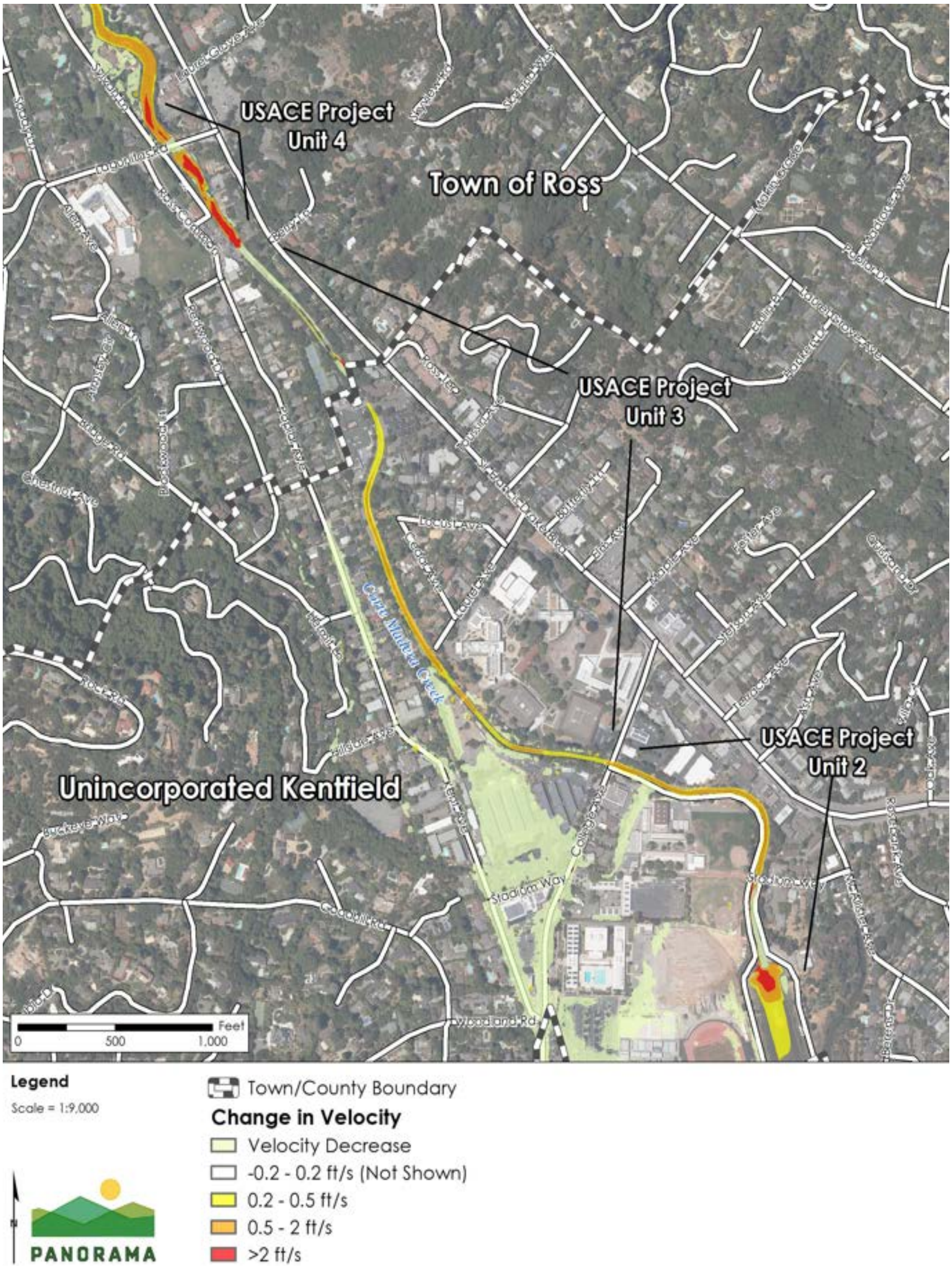
Flooding

Alternative 1 would result in reduced flood hazards in the town of Ross and Kentfield, as shown in Figure 5.3-5 through Figure 5.3-7. Figure 5.3-5 through 5.3-7 represent Alternative 1 impacts on the future condition baseline, including sea level rise projections included in the future condition baseline as discussed in Section 3.9 Hydrology. Alternative 1 would result in increased water surface elevations in the concrete channel where the new fish pools would be installed and flooding also would increase approximately 0.5 to 1 foot in the concrete channel below College Avenue during the 10-year, 25-year, and 100-year flood event. Small areas directly adjacent to the concrete channel in the parking area at the College of Marin west of College Avenue and a parking area east of College Avenue also would be subject to increase in water surface elevation of 0.2 to 1 foot during the 10-year, 25-year, and 100-year flood events. A small area adjacent to the concrete channel within Frederick Allen Park and within residential areas on the left bank of Corte Madera Creek would be subject to increased water surface elevation of 0.2 to 0.5 foot during the 100-year flood event as shown on Figure 5.3-7. Substantial reduction in water surface elevation, including model-predicted removal of flooding, would occur during the 10-year, 25-year, and 100-year flood events in the Town of Ross along Sylvan Lane, Sir Francis Drake Boulevard, Lagunitas Road, Ross Common, Poplar Avenue, and Redwood Road. Flooding also would be reduced along Kent Avenue and in the Granton Park neighborhood and the residential area north of Corte Madera Creek and east of College Avenue in the Kentfield area.

Comparison of Impacts to the Proposed Project

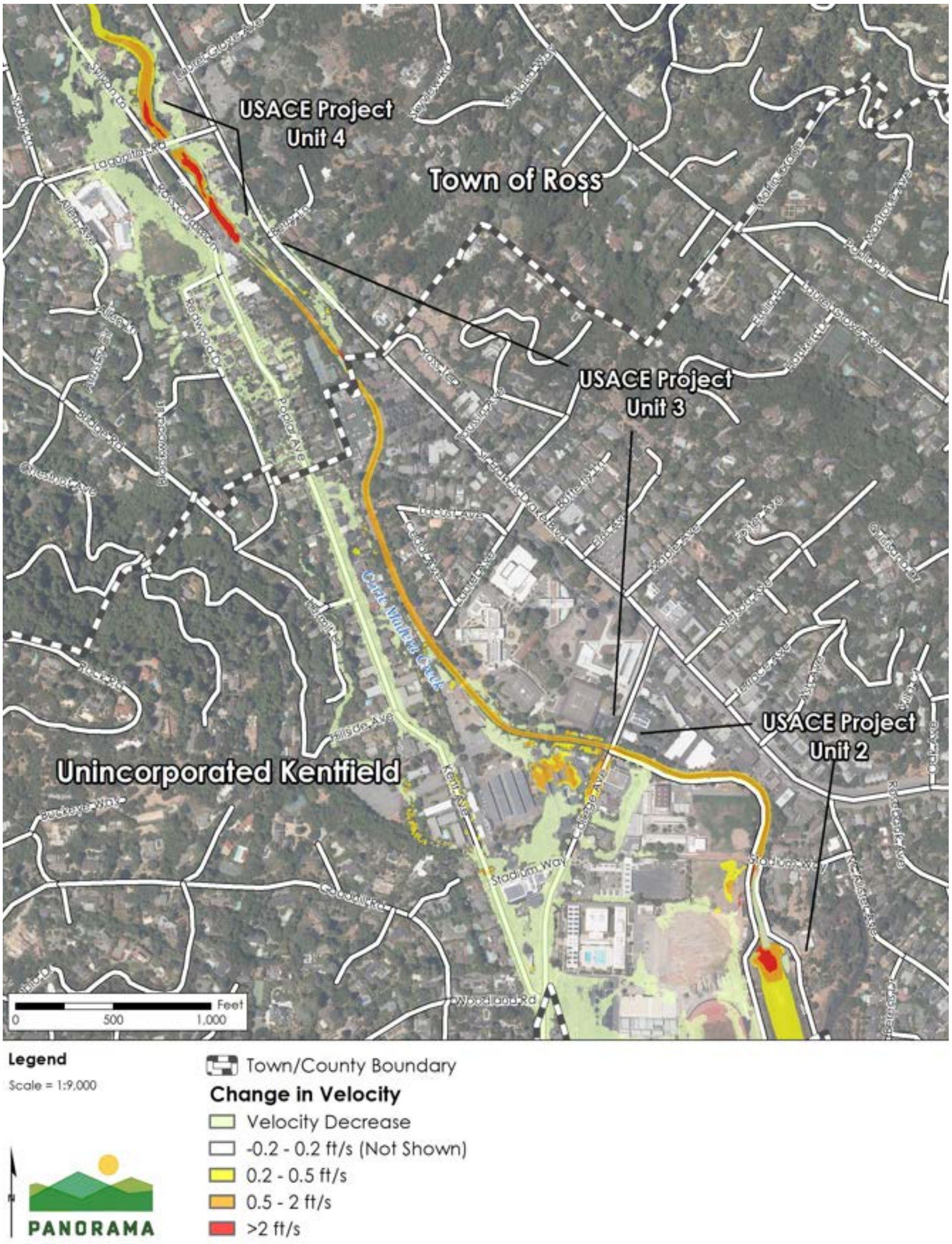
Alternative 1 would have a slightly less construction impact on water quality than the proposed project, because Alternative 1 would avoid construction disturbance of soils in Frederick Allen Park. Alternative 1 would not create increased riparian and natural stream channel functions in Frederick Allen Park and would not have the same long-term water quality benefits as the proposed project. Alternative 1 would have similar impacts and benefits to flooding as the proposed project, as shown in the flood reduction figures; however, in a 100-year storm event, Alternative 1 would have less flood reduction benefit and would result in increased water surface elevation compared to the proposed project, particularly along Poplar Avenue. Figure 5.3-8 shows the difference in model-predicted water surface elevations between Alternative 1 and the proposed project, under a 100-year storm event. Alternative 1 would result in lower water surface elevation in the creek channel and in the Frederick Allen Park floodplain because the floodplain area would not be constructed. However, residential and commercial areas around Frederick Allen Park would experience reduced flood reduction benefits under Alternative 1 than would be experienced with the proposed project.

Figure 5.3-2 Alternative 1 Changes in Velocity from Future Conditions - 10-Year Flood Event



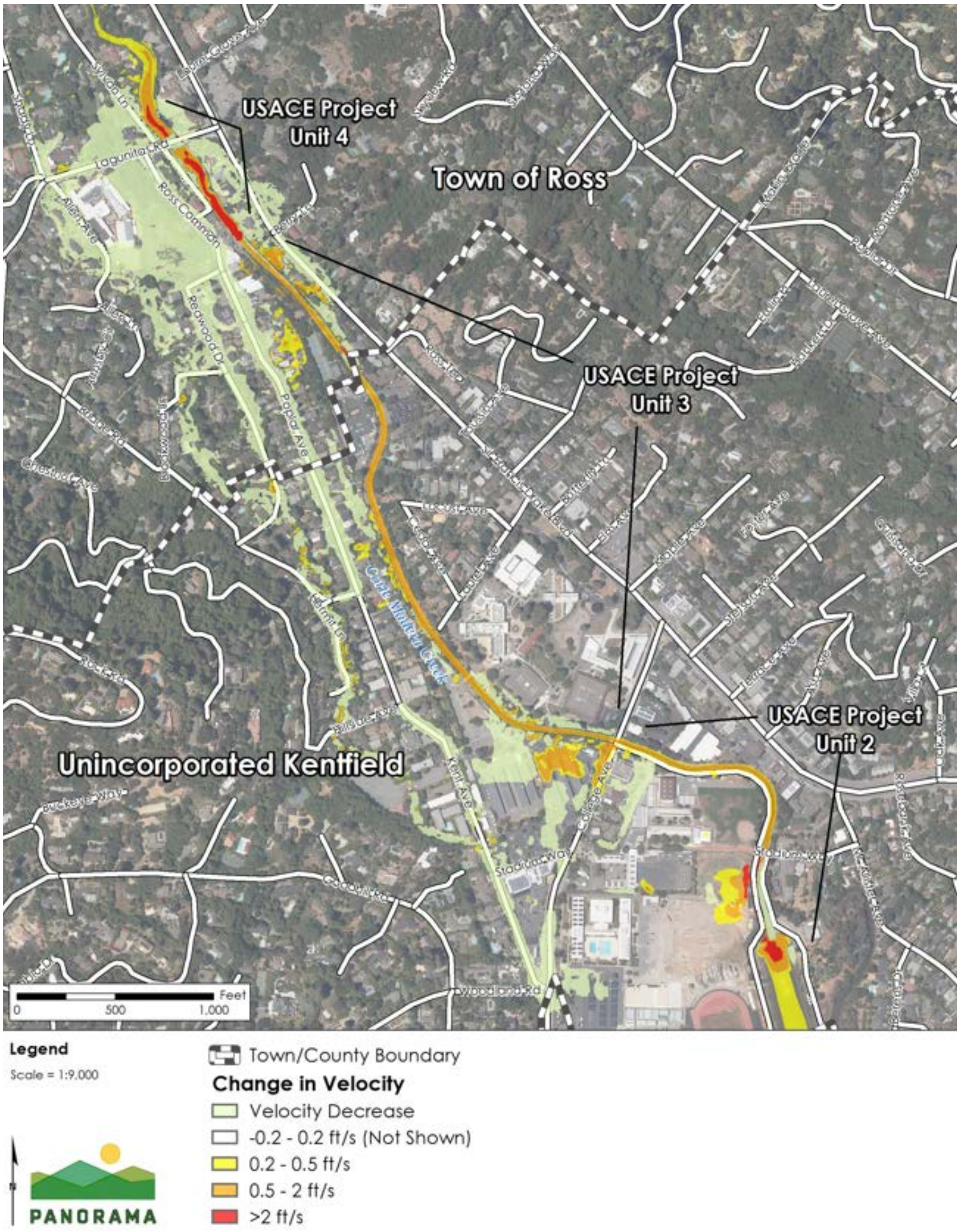
Source: (GHD, 2020)

Figure 5.3-3 Alternative 1 Changes in Velocity from Future Conditions - 25-Year Flood Event



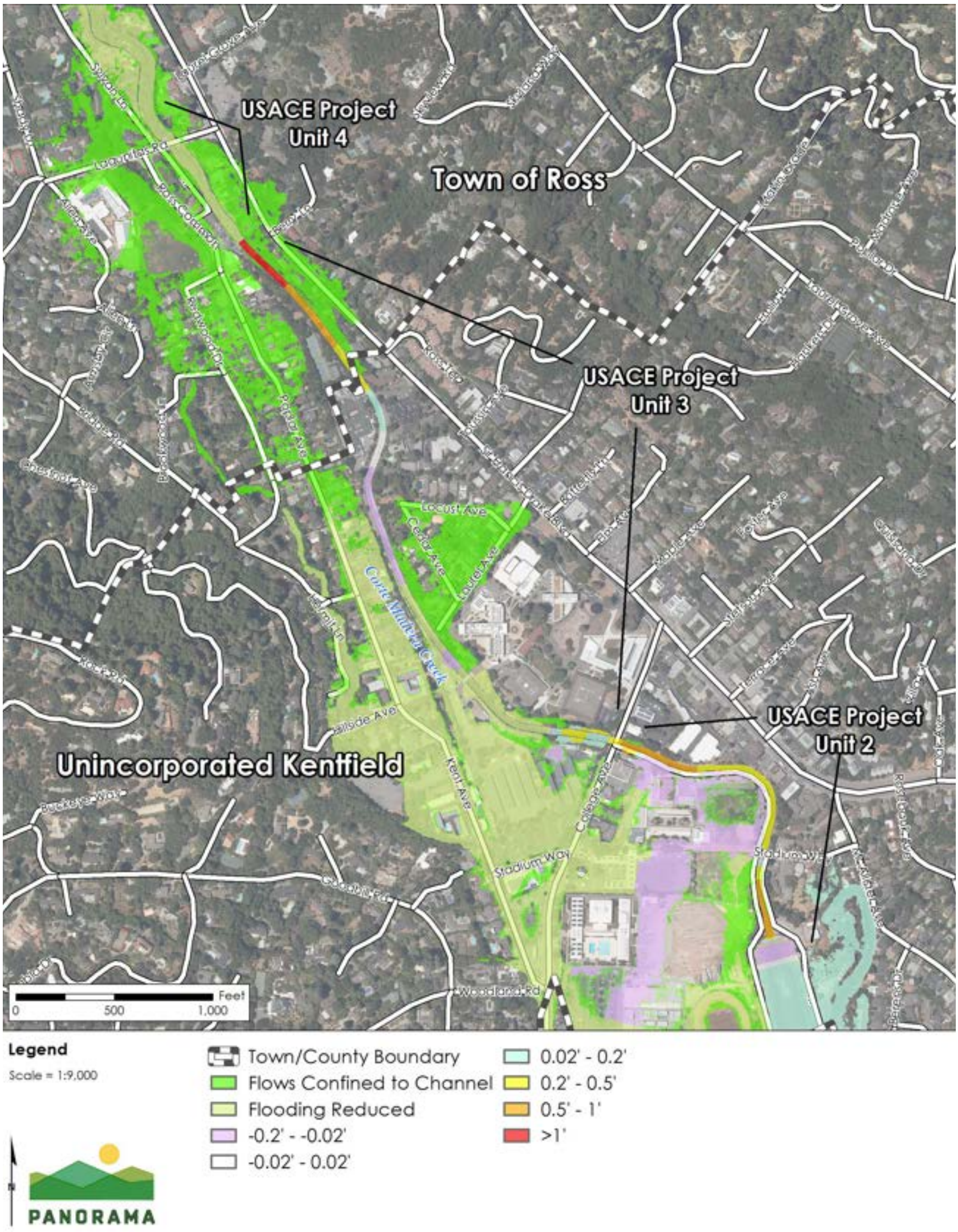
Source: (GHD, 2020)

Figure 5.3-4 Alternative 1 Changes in Velocity from Future Conditions - 100-Year Flood Event



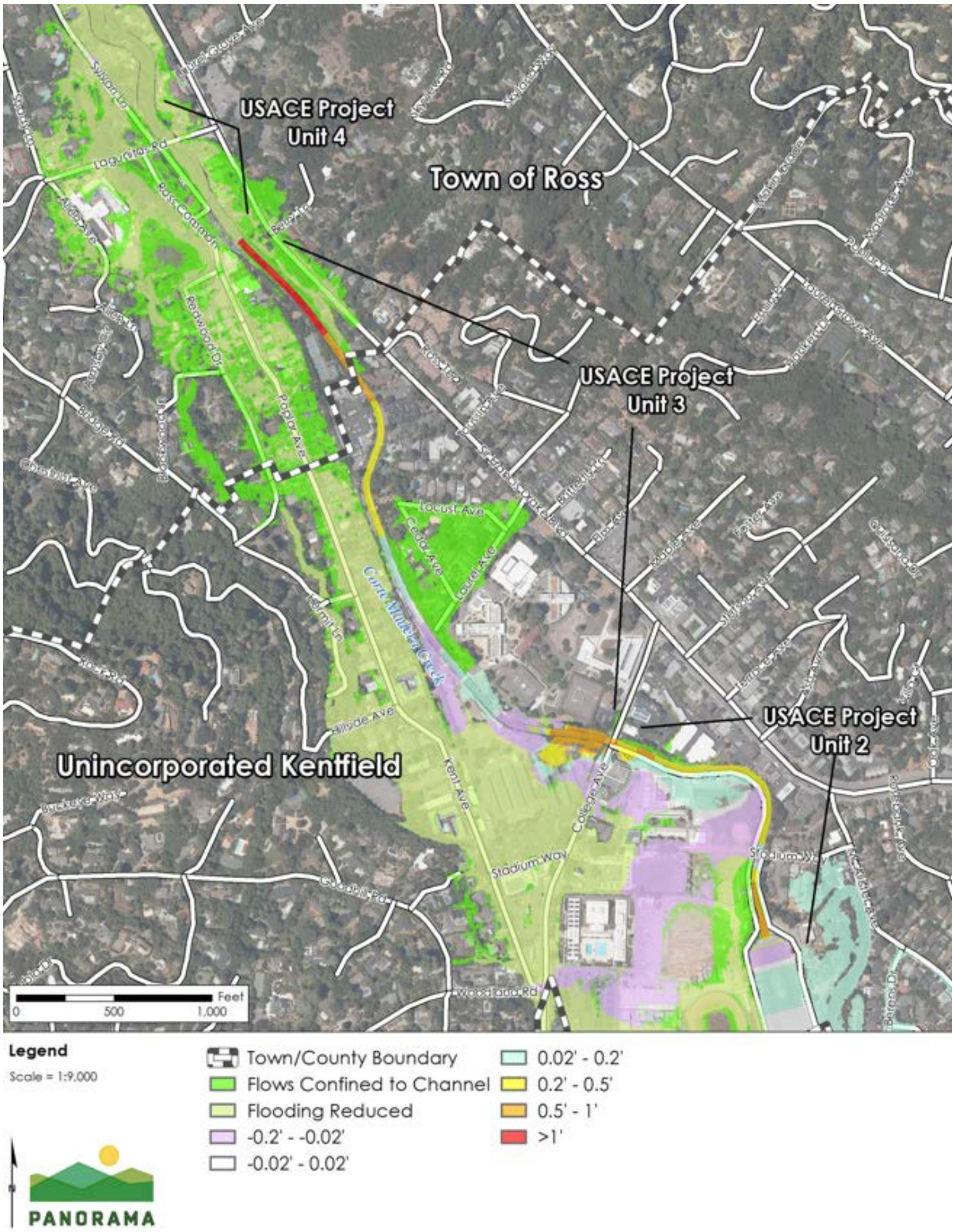
Source: (GHD, 2020)

Figure 5.3-5 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 10-Year Flood Event



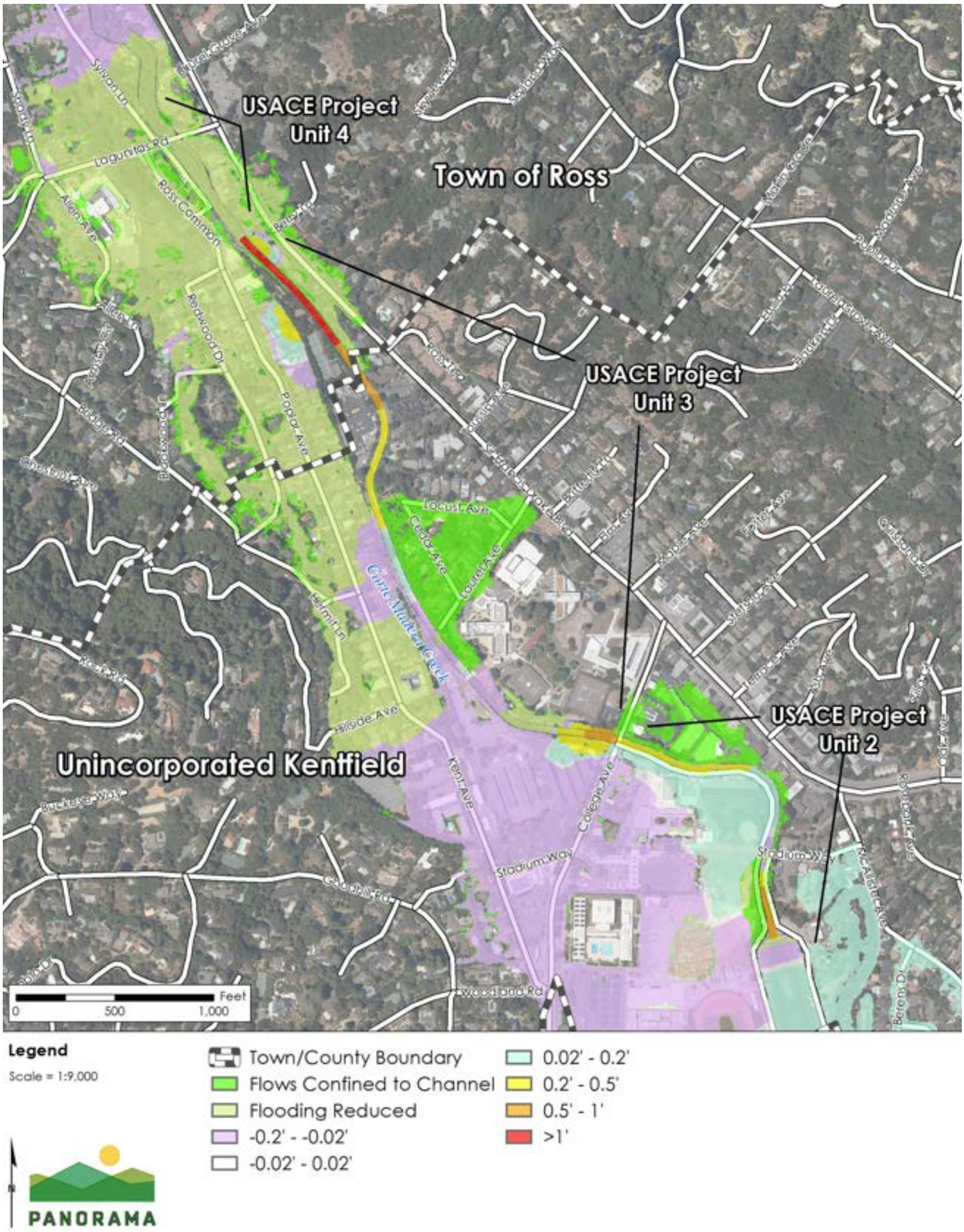
Source: (GHD, 2020)

Figure 5.3-6 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 25-Year Flood Event



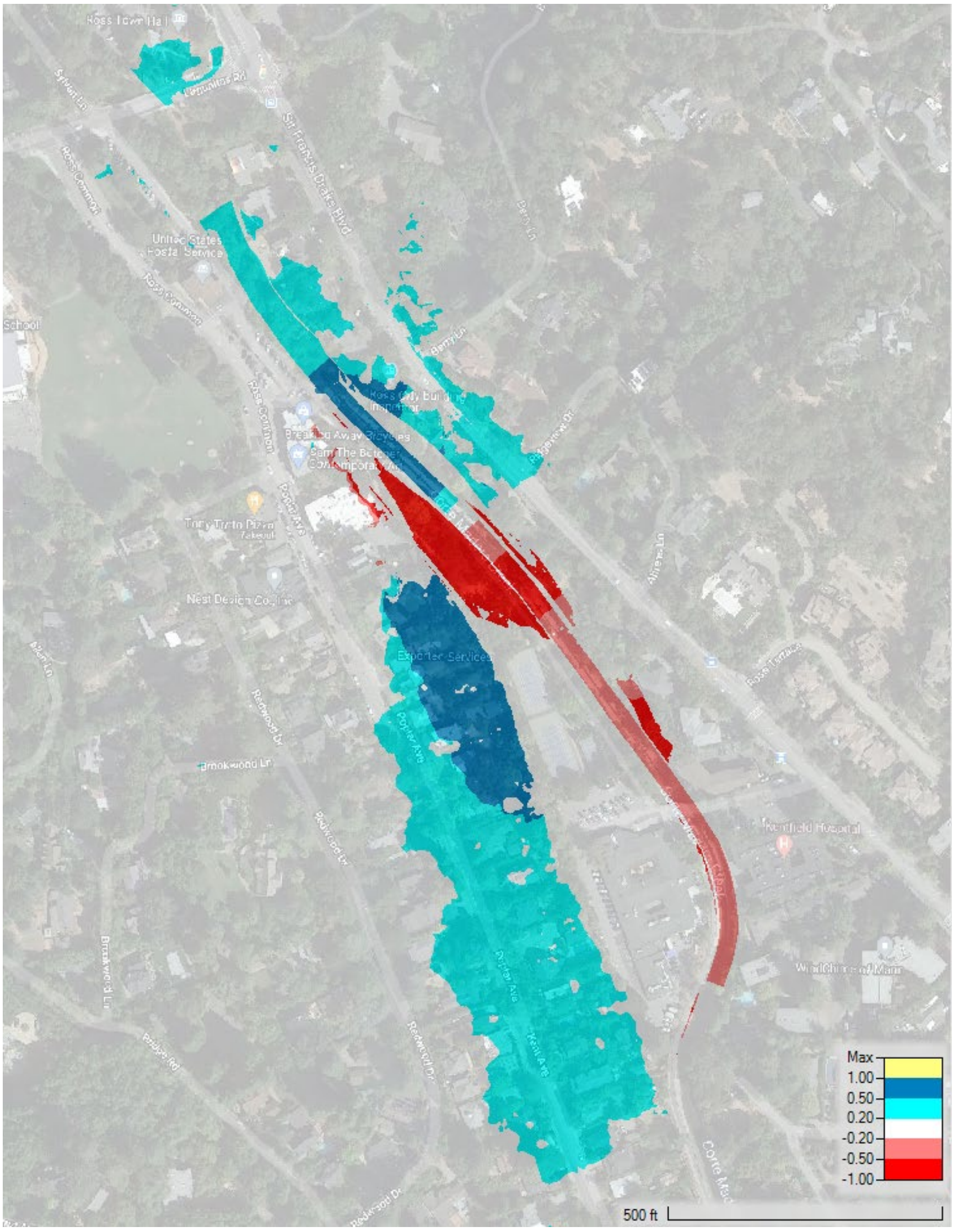
Source: (GHD, 2020)

Figure 5.3-7 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 100-Year Flood Event



Source: (GHD, 2020)

Figure 5.3-8 Difference in Future Water Surface Elevation Between Alternative 1 and Proposed Project – 100-Year Flood Event



Source: (GHD, 2020)

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Noise

Alternative 1 Impacts

Alternative 1 would generate noise and vibration during the two weeks of construction of the fish pools. This noise would be partially attenuated by the existing concrete walls, and the noise and vibration impact would be less than significant. Alternative 1 would not occur in an airport land use plan area. The noise from maintenance of Alternative 1 would be similar to noise generated during maintenance of the existing concrete channel and fish pools and the Alternative 1 maintenance impact would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would avoid the potentially significant construction noise impacts of the proposed project. Alternative 1 would generate less short-term noise impacts than the proposed project and similar long-term maintenance noise as the proposed project.

Public Services

Alternative 1 Impacts

Alternative 1 would not cause a need for new or altered government facilities related to fire protection, police protection, schools, and parks. The fish pools to be constructed in the concrete channel adjacent to Frederick Allen Park would not increase the need for fire or police services, and the alternative would not induce population growth or increase the need for new schools. Alternative 1 would require maintenance of the concrete flood control channel similar to existing conditions.

Comparison of Impacts to the Proposed Project

Alternative 1 would have the same less-than-significant impact on public services as the proposed project.

Recreation

Alternative 1 Impacts

Alternative 1 would not impact Frederick Allen Park. The additional fish pools would have no impact on recreation.

Comparison of Impacts to the Proposed Project

Construction of Alternative 1 would not involve closures of Fredrick Allen Park and Bike Route 20 through Frederick Allen Park because the alternative would not include modifications to Frederick Allen Park. Alternative 1 would not increase the use of existing parks, include new recreational facilities, or affect existing recreational opportunities. Alternative 1 would avoid the proposed project impacts from increased flooding of the multi-use pathway in Frederick Allen Park and temporary loss of shade. Alternative 1 also would avoid the less-than-significant impacts from the new public access to the creek. Alternative 1 would not have the beneficial impact on the recreational experience in Fredrick Allen Park, resulting from opportunities afforded through increased creek and habitat viewing.

Transportation and Circulation

Alternative 1 Impacts

Alternative 1 would require access of the concrete channel off area roads and would not conflict with any transportation management plan or policy. The alternative would not require closure of any bike route.

Comparison of Impacts to the Proposed Project

Alternative 1 would involve minimal vehicle miles traveled from maintenance of the existing flood control channel, similar to the proposed project. Alternative 1 would avoid the proposed project's potentially significant, construction-related impacts on transportation and traffic resulting from temporary closure of Bike Route 20 in Frederick Allen Park. Alternative 1 would have a less-than-significant impact on transportation and circulation from vehicle miles traveled to maintain the flood control channel.

Tribal Cultural Resources

Alternative 1 Impacts

Alternative 1 would involve minimal ground-disturbing activities where the fish pools would be excavated in the concrete channel. The potential impact on tribal cultural resources would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would have a slightly reduced potential to encounter tribal cultural resources during earthwork than the proposed project because Alternative 1 would not involve grading and excavation in Frederick Allen Park. However, both the proposed project and alternative would have a low potential to affect tribal cultural resources.

Utilities and Service Systems

Alternative 1 Impacts

Alternative 1 would not require or result in relocation or construction of new water conveyance, wastewater treatment, or stormwater drainage, or the addition of electric power, natural gas, or telecommunications facilities. Alternative 1 would not require water supplies because the fish pools would be constructed within the channel. The fish pool construction would generate a very minimal volume of solid waste from the area of fish pool excavation. The impact would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would have a reduced impact on utilities and service systems, compared to construction of the proposed project in Frederick Allen Park. Alternative 1 would require less water because water to stabilize the soil in Frederick Allen Park would not be required. Alternative 1 also would generate less waste because excavation at Frederick Allen Park would not occur. Alternative 1 and the proposed project would have a similar, less-than-significant impact on utilities during operation and maintenance.

Agriculture and Forestry, Land Use and Planning, Mineral Resources, Population and Housing, Socioeconomics, and Wildfire

Alternative 1 Impacts

Alternative 1 would not involve impacts on lands containing agricultural or forestry resources or mineral resources. Alternative 1 would not involve changes in land use or character of the community and would not conflict with the Town of Ross General Plan, Kentfield General Plan, or Marin Countywide Plan. Alternative 1 would not induce unplanned population growth, and planned growth would continue as under existing conditions. Alternative 1 would not involve any activities in a very high fire hazard area.

Comparison of Impacts to the Proposed Project

Alternative 1 would avoid the proposed project's less-than-significant impacts related to dividing an established community. Alternative 1 would have slightly less impact on land use compared to the proposed project.

Alternative 1 Summary, Feasibility, and Objectives

Alternative 1 would have less severe less than significant construction impacts on aesthetics, air quality, biological resources, geology and soils, GHG emissions, hazardous materials, hydrology and water quality, noise, recreation, transportation and circulation, and utilities than the proposed project (all of which would be less than significant with mitigation under the proposed project). Alternative 1 would avoid significant and unavoidable impacts on visual quality during the vegetation establishment period (approximately 10 years). The Alternative 1 impacts would have the same less than significant impacts to the proposed project impacts on cultural resources, tribal cultural resources, public services, agriculture and forestry resources, minerals, land use and planning, population and housing, and wildfire.

Alternative 1 would have less long-term benefits to aesthetics, biological resources, geology and soils, greenhouse gases, hydrology and water quality, and recreation than the proposed project because Alternative 1 would not include creation of a natural creek channel, floodplain, and riparian habitat in Frederick Allen Park. The fish pools in the concrete channel would result in limited benefits to habitat for fish and would not benefit terrestrial species or habitat over the long-term.

As described in Table 5.2-1, Alternative 1 is expected meet all feasibility criteria and would meet most project objectives.

5.3.3 Alternative 2: Boardwalk in Frederick Allen Park

Description

Alternative 2 would maintain the existing elevation for Bike Route 20 in Frederick Allen Park. The elevation of Bike Route 20 would be maintained at the current bike path elevation by constructing the multi-use path as a boardwalk, slightly elevated above the Frederick Allen Park floodplain area. The multi-use path would be along the western perimeter of the park and adjacent to the new, approximately 2-foot-tall floodwall. The boardwalk then would meander

back to join the existing pathway, as shown in Figure 5.3-8. The use of a boardwalk would allow the pathway to maintain its current elevation without causing loss of floodplain storage and would allow planting vegetation beneath the boardwalk. Alternative 2 also would differ from the proposed project because it would not include new public access to the creek. New access would be created for creek and flood control maintenance only. Alternative 2 would not modify any proposed project elements outside Frederick Allen Park. Alternative 2 would differ from the proposed project only in the elevation, alignment, and material used to construct the realigned Bike Route 20 in Frederick Allen Park, the location of the maintenance access path, and the removed proposed public access to Corte Madera Creek.

Environmental Impacts

Alternative 2 would involve construction of all the same elements as the proposed project, except that construction of the realigned multi-use path through the newly-created floodplain under the proposed project would be replaced with constructing a new boardwalk and restricting public use of the new creek access in Frederick Allen Park. The following resource impact discussions focus on the impacts from these two elements that differ from the proposed project. All other environmental impacts from Alternative 2 would be the same as the proposed project, which are discussed in Chapter 3.

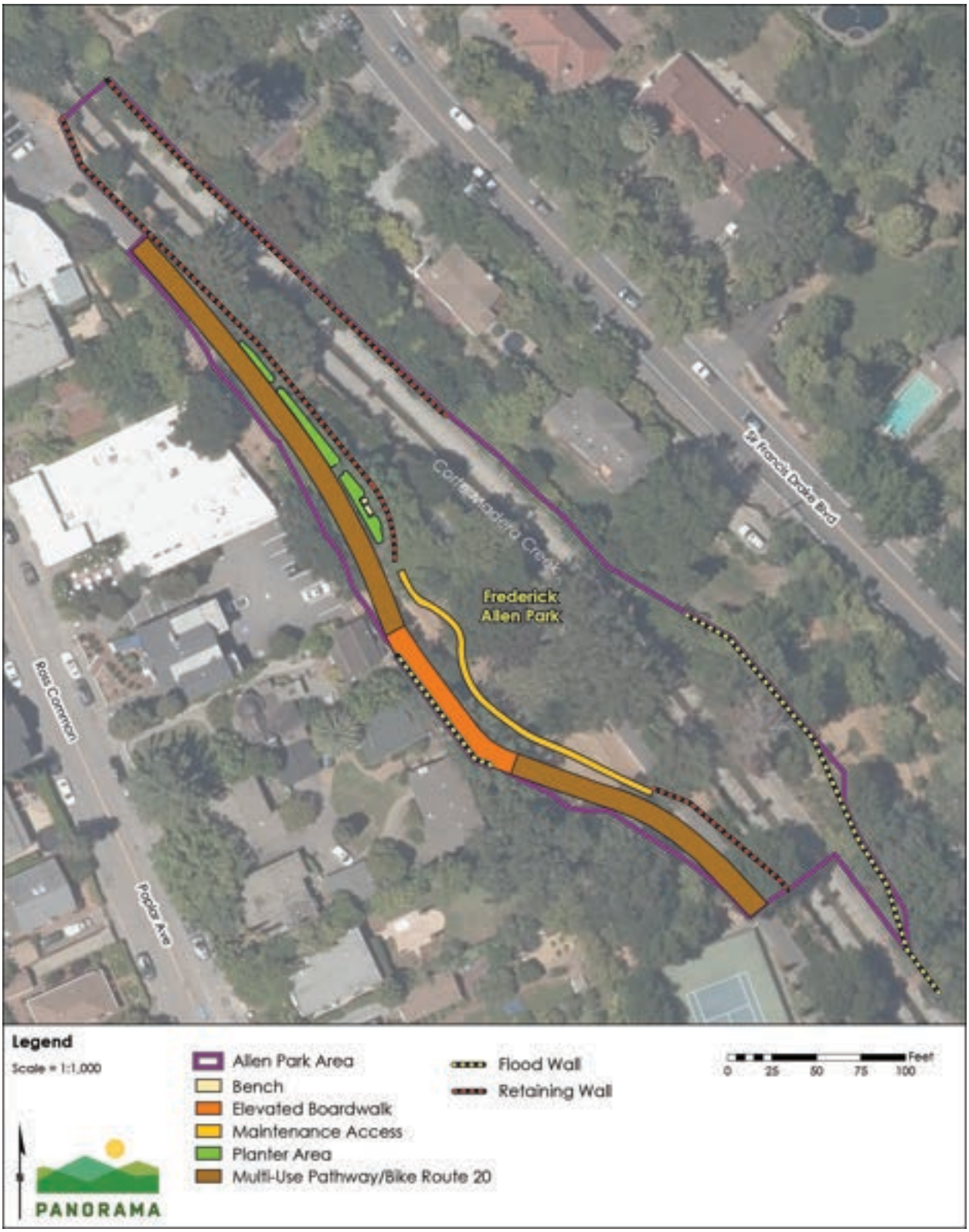
Aesthetics and Visual Resources

Alternative 2 Impacts

The Alternative 2 area is not visible from a state scenic highway and would not affect scenic resources along a state scenic highway. Alternative 2 would not conflict with applicable zoning and other regulations governing scenic quality. Alternative 2 would not create a new source of substantial light or glare that would affect day or nighttime views. The alternative pathway design through use of a boardwalk would not conflict with applicable zoning or other regulations governing scenic quality. The Alternative 2 boardwalk would be an area of Frederick Allen Park that contains 13 trees. Trees along the Alternative 2 boardwalk would be removed as part of the proposed floodplain construction and grading in Frederick Allen Park, which are discussed in Chapter 3. Construction of the Alternative 2 boardwalk and maintenance path would not require removal of any additional trees beyond those that would be removed for the proposed project. Alternative 2 would allow additional vegetation planting in Frederick Allen Park because the boardwalk would allow light to penetrate beneath the pathway, and ferns or other small vegetation could be planted in the floodplain beneath the elevated, multi-use boardwalk. The maintenance access path would be 4 feet wide and would parallel the creek. Trees, shrubs, and riparian vegetation would be planted on either side of the narrow maintenance path. The maintenance path would be unpaved to create a natural appearance in the creek corridor. Stairs would be constructed from the retaining wall at the north end of the park to the maintenance path, to provide through access. An artistic rendering of Alternative 2 is shown in Figure 5.3-9.

The impact on visual quality of just the Alternative 2 boardwalk and maintenance pathway would be less than significant. However, implementation of Alternative 2 would require construction of the floodplain in Frederick Allen Park, which would require removal of up to

Figure 5.3-9 Alternative 2 Layout



Source: (GHD, 2020)

Figure 5.3-10 Alternative 2 Visual Representation Looking North from the Tennis Courts at Frederick Allen Park

145 trees for floodplain grading. Alternative 2 would include planting a similar number of trees and similar species to those of the proposed project, as shown in the landscape plan provided in Appendix B. Additional trees could be planted because Alternative 2 would be adjacent to the 2-foot-tall floodwall, and the boardwalk would occupy the majority of the 15-foot setback from the floodwall. Therefore, the remaining area in Frederick Allen Park would not be subject to vegetation setbacks. Locating the boardwalk along the edge of the park also would create a visually uniform view across the floodplain and park, for viewers looking from the boardwalk toward the replanted areas.

Alternative 2 still would result in a significant and unavoidable impact immediately following construction and up to 10 years after construction, because of the loss of dense vegetation and tree canopy while the newly planted trees develop and establish in the area. The reduction in tree canopy would result in reduced intactness and unity in the landscape because the new concrete retaining walls and homes opposite the park would become more visible. After 10 years of vegetation establishment, the tree canopy and vegetation would visually screen the concrete retaining wall and residential areas and would create a uniform and intact landscape, as shown in Figure 5.3-9. The landscape vividness, intactness, and unity would increase relative to existing conditions because the natural creek channel and riparian vegetation would allow for views of a stream corridor with understory and canopy vegetation that appear consistent with the stream/riparian context, and the impact would be a net benefit to visual quality after 10 years of vegetation growth.

Comparison of Impacts to the Proposed Project

Alternative 2 would have comparable short-term impacts on visual quality to the proposed project because Alternative 2 would require removal of trees from the same area in Frederick Allen Park. The visual impact of Alternative 2 would be equivalent to the project.

Air Quality and Greenhouse Gas Emission

Alternative 2 Impacts

Alternative 2 would require use of construction equipment to construct the boardwalk and maintenance access path. Implementation of Alternative 2 in combination with the proposed project elements in other areas would result in generation of air quality and GHG emissions equivalent to the proposed project, including emissions of toxic air contaminants because the boardwalk and maintenance path would be constructed in lieu of the paved pathway and unpaved access to the creek. Implementation of Mitigation Measures 3.3-2 and Mitigation Measure 3.3-3, which would require implementation of dust control measures and use of USEPA or CARB Tier 3 or higher rated equipment would reduce the impact of Alternative 2 in combination with the proposed project in other areas to a less-than-significant level, similar to the project impact described in detail in Chapter 3. Alternative 2 would require removal of the same number of trees as the proposed project. Alternative 2 would allow increased planting relative to the proposed project because light and water could penetrate the boardwalk, which would allow planting underneath it. The increased planting would result in long-term GHG reduction benefits.

Comparison of Impacts to the Proposed Project

The Alternative 2 air quality and GHG emission impacts would be equivalent to the proposed project. Compared to the proposed project, Alternative 2 would result in a minor long-term net benefit on GHG emissions because of increased carbon sequestration from planting below the boardwalk.

Biological Resources

Alternative 2 Impacts

The Alternative 2 boardwalk and maintenance pathway would be in the same area of proposed project grading and vegetation removal. The impacts from construction of the Alternative 2 boardwalk and maintenance path would be equivalent to the direct and indirect impacts otherwise described for construction of the proposed project in Frederick Allen Park. Alternative 2 would not result in any new or increased impacts on biological resources. Alternative 2 would not create public access to Corte Madera Creek and would avoid the proposed project's less-than-significant impact from new access to the creek. Alternative 2 would allow vegetation planting beneath the boardwalk and would create more riparian areas than the proposed project.

Comparison of Impacts to the Proposed Project

Alternative 2 direct and indirect construction impacts on biological resources would be equivalent to the proposed project. Alternative 2 would result in less operational impacts on biological resources than the proposed project because Alternative 2 would not create public access to the creek. Alternative 2 also would increase more areas of riparian planting than the proposed project, resulting in additional benefits from increased riparian areas.

Cultural Resources

The Alternative 2 boardwalk and maintenance path construction would be in areas of proposed project grading. Alternative 2 would result in equivalent impacts on cultural resources to the proposed project because Alternative 2 would require grading and construction in the same areas as the proposed project and would have the same potential to disturb significant cultural resources. The impact would be less than significant with mitigation incorporated, as described in Chapter 3.

Energy

The intensity of construction of the boardwalk would be roughly equivalent to the intensity of construction of the proposed project paved multi-use pathway and unpaved creek access in Frederick Allen Park. The Alternative 2 boardwalk and maintenance path construction would require energy (fuel) use equivalent to the proposed project. The impact on energy use during construction would be less than significant. The Alternative 2 boardwalk and maintenance pathway would require similar maintenance to the proposed project paved multi-use pathway. Furthermore, the impact on energy use during Alternative 2 maintenance would be less than significant. Therefore, the impact of Alternative 2 would be equivalent to the proposed project.

Geology and Soils

Alternative 2 Impacts

Alternative 2 would be on the same geologic and soil units as the proposed project in Frederick Allen Park. The raised boardwalk structure potentially could result in geologic hazards from seismic activity unstable soil conditions, if a geotechnical investigation is not performed or geotechnical recommendations for the boardwalk are not implemented. The District would implement Mitigation Measures 3.6-1, which would require completion of a geotechnical survey and implementation of all geotechnical recommendations in the final design. The impact from implementation of Alternative 2 would be less than significant with mitigation incorporated.

Comparison of Impacts to the Proposed Project

Alternative 2 would have a slightly increased potential for geologic hazards because of the raised structure; however, the impact of Alternative 2 would be equivalent to the proposed project, with implementation of the geotechnical recommendations.

Hazards and Hazardous Materials

Alternative 2 would require use of the same volume, type, and quantity of hazardous materials as the proposed project in Frederick Allen Park, and the impact from hazardous materials would be less than significant. Alternative 2 would slightly reduce the less-than-significant flood hazard impact, because of relocating the multi-use pathway to an elevated boardwalk above the floodplain. The potential for flooding of the boardwalk would be less than that of the proposed project's multi-use pathway, and thus the potential hazard would be slightly less than the proposed project. The Alternative 2 impact on hazards and hazardous materials would be slightly less than the proposed project impact because of the elevation of the boardwalk above the floodplain.

Hydrology and Water Quality

Alternative 2 Impacts

Alternative 2 construction would require grading and excavation in the same areas as the proposed project and would have the same low potential to encounter contaminated sediments that contain water quality pollutants, similar to the proposed project. Implementation of Mitigation Measure 3.10-1 would require testing of excavated sediment to evaluate the risk of contamination. Through proper handling and treatment of any potentially contaminated soils, the water quality impact would be less than significant. The Alternative 2 boardwalk would reduce the amount of impervious surface used in pathway construction and would allow slightly increased groundwater infiltration and reduced runoff. The Alternative 2 boardwalk would be above the floodplain in Frederick Allen Park, and the boardwalk would not see increased flooding over existing conditions.

Comparison of Impacts to the Proposed Project

Alternative 2, in combination with the project elements in other areas, would result in the same water surface elevation increase as the proposed project and would achieve the same flood reduction benefits as the proposed project. Alternative 2 impacts on hydrology and water

quality would be slightly less than the proposed project impacts because the boardwalk would allow increased infiltration and would be elevated above the floodplain.

Noise

Alternative 2 Impacts

Construction of the Alternative 2 boardwalk would result in noise and vibration during installation of the footings and creation of the boardwalk pathway. The boardwalk would be adjacent to commercial buildings and would not result in increased noise to adjacent sensitive receptors. Alternative 2 would not reduce the potentially significant noise impact of the proposed project in other areas. The boardwalk would be installed adjacent to structures on Poplar Avenue and the vibration impact would be potentially significant, similar to the proposed project. Implementation of Mitigation Measure 3.11-2 would require monitoring the vibration and taking measures to reduce the vibration if it approaches criteria thresholds near buildings. Because the District would implement Mitigation Measure 3.11-2, the resulting Alternative 2 vibration impact would be less than significant with mitigation incorporated.

Comparison of Impacts to the Proposed Project

The Alternative 2 boardwalk would require similar intensity of maintenance to the proposed project paved path, or maintenance of the existing pathway. The Alternative 2 noise and vibration impacts would be less than significant with mitigation incorporated and equivalent to the proposed project noise and vibration impacts.

Public Services

Alternative 2 Impacts

Alternative 2 would not generate a need for new or altered government facilities, related to fire protection, police protection, schools, and parks. The boardwalk in Frederick Allen Park would not increase the need for fire department or police services, would not induce population growth, and would not increase the need for new schools. Alternative 2 would require maintenance of the boardwalk's pathway, similar to existing conditions.

Comparison of Impacts to the Proposed Project

Alternative 2 would have the same less-than-significant impact on public services as the proposed project. Alternative 2 impacts on public services would be equivalent to the proposed project.

Recreation

Alternative 2 Impacts

Alternative 2 would not involve closures of Fredrick Allen Park and Bike Route 20 through Frederick Allen Park during construction of the boardwalk. Alternative 2 would not include new public access to the creek. Alternative 2 would locate the Bike Route 20 on a boardwalk above the floodplain, where the pathway would not be subject to increased flooding. Alternative 2 would require removal of trees to construct the elevated pathway, maintenance access, and habitat.

Comparison of Impacts to the Proposed Project

Alternative 2 would involve landscaping with new riparian trees and vegetation and the temporary loss of shade would result in impacts on the recreation experience, similar to the proposed project as described in Chapter 3. Alternative 2 would avoid the proposed project impacts from increased flooding of the multi-use pathway in Frederick Allen Park. Alternative 2 also would avoid the proposed project's less-than-significant impacts from the new access to the creek. Alternative 2 would equivalent beneficial impact on the recreational experience in Fredrick Allen Park to the proposed project, by providing increased creek and habitat viewing and educational opportunities.

Transportation and Circulation

Alternative 2 Impacts

Alternative 2 would require temporary closure of Bike Route 20 during construction of the boardwalk and related landscaping in Frederick Allen Park. The impact from this temporary closure would be potentially significant. Implementation of Mitigation Measure 3.14-1 would require detours for bicyclists and pedestrians during construction, to maintain bicycle and pedestrian access. The impact from Alternative 2 construction would be less than significant with mitigation incorporated, because of the use of safe detours. Alternative 2 would require similar maintenance as the proposed project pathway and existing pathway in Frederick Allen Park. The operation and maintenance impact would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 2 would require an equivalent construction duration to that of the proposed project and would result in equivalent, temporary impacts on traffic and transportation. The Alternative 2 boardwalk would be elevated above the floodplain and would not be subject to increased flooding, resulting in less long-term impacts on bicycle and pedestrian transportation than the proposed project.

Tribal Cultural Resources

Alternative 2 would involve construction of the boardwalk and maintenance pathway in the same location as proposed project grading and construction. Alternative 2 would have an equivalent potential to encounter and disturb tribal cultural resources as the proposed project. The impact on tribal cultural resources would be less than significant with mitigation incorporated, as described in Chapter 3.

Utilities and Service Systems

Alternative 2 Impacts

Construction of the boardwalk pathway and maintenance path would have no impact on utilities. The boardwalk and maintenance path would generate a small amount of waste during construction. The boardwalk and maintenance path grading would require a similar volume of water as the proposed project for stabilization and irrigation of landscaped areas. The impact on service systems would be less than significant.

Comparison of Impacts to the Proposed Project
The Alternative 2 impact on utilities and service systems would be equivalent to the proposed project impacts and would be less than significant.

Agriculture and Forestry, Land Use and Planning, Mineral Resources, Population and Housing, and Wildfire
Alternative 2 Impacts
Alternative 2 would not involve impacts on land containing agricultural or forestry resources or mineral resources. Alternative 2 would not involve changes in land use or character of the community and would not conflict with the Town of Ross General Plan, Kentfield General Plan, or Marin Countywide Plan. Alternative 2 would not induce unplanned population growth, and planned growth would continue as under existing conditions. Alternative 2 would not involve any activities in a very high fire hazard area.

Comparison of Impacts to the Proposed Project
Alternative 2 would have equivalent temporary land use impacts to the proposed project, because of closure of Frederick Allen Park during construction and temporary physically dividing of a community by reduced access across Corte Madera Creek during construction. Alternative 2 agriculture and forestry, land use and planning, mineral resources, population and housing, and wildfire impacts would be equivalent to the proposed project.

Alternative 2 Summary, Feasibility, and Objectives
As discussed above and summarized in Table 5.4-1, Alternative 2 would result in reduced operational impacts and increased long-term benefits on biological resources, hydrology and water quality, hazards, recreation, and traffic and transportation, compared to the proposed project. Alternative 2 would cause equivalent significant and unavoidable impact to the proposed project on aesthetics, and less than significant with mitigation impacts on air quality, cultural resources, geology and soils, GHG emissions, noise, public services, tribal cultural resources, utilities and service systems, agriculture and forestry resources, minerals, land use and planning, population and housing, and wildfire. As described in Table 5.2-1, Alternative 2 would meet all feasibility criteria and all project objectives.

5.3.4 Alternative 3: Reduced Concrete

Description
Alternative 3 would include modification of several proposed project elements, reducing concrete in the project design in favor of natural materials. Alternative 3 would include constructing the retaining wall in Unit 4 and Frederick Allen Park using materials other than concrete, such as rocks or other material, to allow additional planting of vegetative material within the rocks or retaining wall. Alternative 3 also would replace the concrete transition structure at the connection between Units 3 and 4 with quarter- or half-ton rock, to protect the existing sanitary sewer line and stabilize the channel grade without use of concrete. Alternative 3 also would include constructing the additional floodwall segment within lower Unit 2 (downstream from College Avenue), using material such as rock or a soil-type barrier instead of

concrete. The natural floodwall would remain on the District's property but would be set back from the existing floodwall.

Environmental Impacts

Alternative 3 would involve construction of the same project elements as the proposed project, with the exception of the concrete retaining walls, concrete transition structure between Units 3 and 4, and the additional concrete floodwall in Unit 2, which would be replaced with non-concrete alternative materials. Construction of the natural material floodwall in Unit 2 could involve a larger footprint and require additional tree removal in comparison with the proposed project, because the new floodwall would be set back from the existing floodwall, whereas the proposed project would have an option of constructing a floodwall attached to the existing wall in Unit 2. The following resource impact discussions focus on the impacts from the construction approach or long-term impacts of Alternative 3 that would differ from the proposed project. All other potential environmental impacts from Alternative 3 would be the same as the proposed project, which are discussed in Chapter 3.

Aesthetics and Visual Resources

Alternative 3 Impacts

Alternative 3 would involve the use of natural materials, including imported rock and vegetation plantings, for construction of the retaining wall in Unit 4, the transition structure between Units 3 and 4, and the additional floodwall segment in Unit 2. The natural material retaining walls and floodwall would blend in with the materials of the stream environment and the visual impact of Alternative 3 would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative would be more visually appealing than the proposed project concrete retaining walls and floodwall and would blend in with the vegetation in the natural creek channel in Unit 4 and surrounding vegetated areas. Alternative 3 would reduce the proposed project impact on visual quality in Frederick Allen Park by incorporating more natural materials to the landscape. However, Alternative 3 would not avoid removal of trees in Frederick Allen Park, and the significant and unavoidable impact on visual quality during the first 10 years after landscaping of the riparian habitat and floodplain would remain.

Air Quality and Greenhouse Gases

Alternative 3 would involve the use of construction equipment and vehicles that would result in temporary GHG emissions, similar to the proposed project. The amount of equipment and vehicle use, as well as fugitive dust and GHG emissions associated with Alternative 3 could be slightly higher than the proposed project because of the increased project footprint and associated number of truck trips for material import and export in Unit 2. Implementation of Mitigation Measure 3.2-1 would reduce the impacts to a less-than-significant level. The alternative would comply with all applicable BAAQMD rules and regulations and would not result in extended exposure of nearby residences to criteria air pollutants or toxic air contaminants. Operational air quality and GHG emissions impacts would be the similar to the proposed project because maintenance activities are anticipated to be similar and infrequent.

Biological Resources

Alternative 3 could involve an increase in the number of trees removed in Unit 2 compared to the proposed project, because the natural material retaining wall would need to be set back from the existing wall. Under the proposed project, whether trees within a 15-foot setback from floodwalls would need to be removed to address Section 408 requirements is uncertain, whereas under Alternative 3, additional trees within the setback from the existing Unit 2 floodwall would need to be removed. All tree removal would be conducted in accordance with procedures defined in local tree ordinances, similar to the proposed project. The tree removal impact on habitat would be potentially significant. Implementation of Mitigation Measure 3.4-2b would require replanting trees that would be removed during construction of Alternative 3. The resulting impact from tree removal would be less than significant with mitigation incorporated. Alternative 3 would not conflict with any local policies or ordinances with respect to the additional tree removal because all tree removal for Alternative 3 would occur within Marin County. The impact regarding conflicts with local policies or ordinances would remain less than significant. Alternative 3 potentially could result in increased temporary impacts on biological resources than the proposed project because of increased tree removal in Unit 2. Because Alternative 3 would use natural materials and increase planting areas in the retaining walls in Units 3 and 4, it potentially could result in increased benefits to biological resources over the operational life of the project.

Cultural Resources

The Alternative 3 non-concrete elements would be in areas of proposed project disturbance. Alternative 3 would result in potential impacts on cultural resources equivalent to the proposed project because it would require grading and construction in the same areas as the proposed project and would have the same potential to disturb significant cultural resources. The impact would be less than significant with mitigation incorporated, as described in Chapter 3.

Energy

The intensity of construction and associated use of energy (fuel) for Alternative 3 would be slightly greater than the proposed project because of slightly increased import of material to construct the natural floodwall in Unit 3. The impact of increased material hauling for Alternative 3 would be less than significant.

Geology and Soils

Alternative 3 would include construction of project components on the same ground and soil substrate as the proposed project. Alternative 3 would require an increase in soil disturbing activities at Unit 2, including additional tree removal, which could result in increased soil loss in comparison with the proposed project. Implementation of BMPs associated with the SWPPP would minimize the potential impacts, and the impact from soil loss and erosion would remain less than significant, similar to the project. Alternative 3 could result in potentially significant impacts if the retaining wall or floodwall is not designed properly to address geologic hazards. Implementation of Mitigation Measure 3.6-1 would require a geotechnical investigation and implementation of geotechnical recommendations in the final design, to address any geologic hazards. The impact of Alternative 3 on geologic hazards would be less than significant with

mitigation incorporated. Alternative 3 potentially could increase geology and soils impacts relative to the project because of the increased area of ground disturbance than concrete retaining and floodwalls.

Hazards and Hazardous Materials
Alternative 3 would require use of the same volume, type, and quantity of hazardous materials as the proposed project. The impact from hazardous materials would be less than significant. Alternative 3 impacts on hazards and hazardous materials would be equivalent to the proposed project.

Hydrology and Water Quality
Alternative 3 would involve use of natural materials for the retaining wall in Units 3 and 4, the transition structure between Units 3 and 4, and the additional floodwall segment in Unit 2. The use of natural materials in constructing the retaining walls and floodwall would not violate any water quality standards, would not result in substantial erosion, and would not result in increased flood hazards. The impact on hydrology and water quality from use of natural materials would be less than significant. The use of natural materials would result in long-term potential benefits to hydrology and water quality in comparison with the proposed project. Use of natural materials rather than concrete at these locations would generate increased groundwater recharge. It would also allow increased vegetation planting, which would naturally retain and absorb water quality contaminants. Alternative 3 would involve similar benefits to flood reduction as the proposed project because the walls would be located in the same locations as the proposed project retaining walls and floodwalls and would have the same function as the proposed project retaining and floodwalls. Additional design and modeling of the Alternative 3 elements would be required, to fully evaluate the engineering feasibility of implementing non-concrete alternatives while protecting the RVSD pipeline and ensuring structural stability.

Noise
Construction of the natural material retaining walls in Units 3 and 4 and the natural floodwall in Unit 2 would require use of equivalent noise-generating construction equipment, just like the proposed project. The Alternative 3 retaining walls and floodwall are not located adjacent to structures and would result in less than significant vibration impacts. The noise impact from Alternative 3 retaining wall construction would be less than significant with mitigation, similar to the impact described for the project in Chapter 3.

Recreation
The Alternative 3 floodwall segment in Unit 2 would be set back from the existing floodwall, which would affect the unnamed and unofficial path #2 (see Section 3.12 and Figure 3.12-2 for the unofficial path location) that would occur in the Alternative 3 floodwall area. Temporary closure of the unofficial path would be required during construction, similar to the proposed project. The impact with respect to deterioration of nearby recreational facilities would be less than significant. Following construction, the unofficial path would remain inaccessible because of the presence of the natural floodwall. The increased use of the formal multi-use path (Bike

Route 20) because of rerouting of the access from the informal path would not increase deterioration of the bike path. The reduced informal recreational access on the left bank of Corte Madera Creek at the Alternative 3 floodwall would have a less than significant impact on recreational opportunities because recreational opportunities are available and would remain on the right bank of Corte Madera Creek. Alternative 3 would have greater impacts on recreation than the proposed project because the alternative would close recreational access to the left bank of Corte Madera Creek at the Unit 2 floodwall.

Transportation and Circulation
Alternative 3 elements would be in the Corte Madera Creek channel and outside any designated bike routes or roads. The Alternative 3 project elements would not conflict with any transportation or circulation plan. Alternative 3 would involve minimal vehicle miles traveled. The impact would be less than significant, similar to the proposed project. Construction, operation, and maintenance of the Alternative 3 non-concrete retaining and floodwalls would result in equivalent transportation impacts to the proposed project's concrete retaining and floodwalls.

Tribal Cultural Resources
Alternative 3 would include excavation and temporary ground disturbance in the same areas as the proposed project. The ground disturbance could affect tribal cultural resources, similar to the proposed project. Implementation of Mitigation Measure 3.5-2, which specifies procedures to avoid impacts on tribal cultural resources, would reduce the impact to a less-than-significant level with mitigation incorporated. Alternative 3 would have an equivalent potential to encounter and affect tribal cultural resources as the proposed project.

Utilities and Service Systems
Alternative 3 would not require or result in relocation or construction of new water conveyance, wastewater treatment, and stormwater drainage, or the addition of electric power, natural gas, or telecommunications facilities. Alternative 3 would protect the existing RVSD pipeline beneath Corte Madera Creek with large rock instead of concrete. If Alternative 3 is approved, additional design and engineering would be required to evaluate whether it would meet RVSD standards for pipeline protection. Because the Alternative 3 design would be subject to conformance with RVSD engineering standards and RVSD review and approval, the impact on the RVSD pipeline would be less than significant. Alternative 3 would require an equivalent amount of water and would generate an equivalent volume of solid waste as the proposed project concrete structures. The impact would be less than significant. Alternative 3 maintenance would generate similar quantities of waste and use of water to the proposed project. The maintenance impact would be less than significant. Thus, Alternative 3 would result in an equivalent impact on utilities and service systems to the proposed project.

Agriculture and Forestry, Land Use and Planning, Mineral Resources, Population and Housing, and Wildfire
Alternative 3 would not involve impacts on land containing agricultural or forestry resources or mineral resources. Alternative 3 would not involve changes in land use or character of the

community and would not conflict with the Town of Ross General Plan, Kentfield General Plan, or Marin Countywide Plan. Alternative 3 would not induce unplanned population growth, and planned growth would continue as under existing conditions. Alternative 3 would not involve any activities in a very high fire hazard area. Alternative 3 would have no impact on land use and population and housing and the impact would be equivalent to the proposed project retaining walls and floodwall in Unit 2.

Alternative 3 Summary, Feasibility, and Objectives

Alternative 3 would result in a slight reduction in long-term aesthetic, biological, and hydrology and water quality impacts than the proposed project because of the reduction in concrete and use of natural materials in the Corte Madera Creek channel and floodplain. Alternative 3 could result in a slight temporary increase in air quality, GHG emissions, and energy (fuel) impacts during construction because of increased import of material to construct the Unit 2 floodwall using natural materials. Alternative 3 would result in equivalent impacts to the proposed project on cultural resources, geology and soils, hazards and hazardous materials, noise, public services, recreation, transportation and traffic, tribal cultural resources, utilities and service systems, agriculture and forestry resources, minerals, land use and planning, population and housing, and wildfire. As described in Table 5.2-1, Alternative 3 would meet all feasibility criteria and all project objectives.

5.4 Comparison of Alternatives

Table 5.4-1 summarizes the impacts of each alternative on the environmental resources evaluated in the Draft EIR. The significance determination (e.g., less than significant with mitigation [LTSM]) for each alternative reflects the impact that would result from implementation of the alternative project components in combination with the proposed project components in areas that are not modified by the alternative.

Table 5.4-1 Comparison of Alternatives and Environmental Considerations

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
Aesthetics and Visual Resources	LTS impact on scenic vistas. SU impact on visual quality (years 0 to 10); long-term beneficial impact on visual quality	No Impact	LTS The alternative would avoid the SU impact on visual quality from removal of trees in Frederick Allen Park. The alternative would not achieve the long-term benefits on visual quality because the existing concrete channel would remain.	SU = The alternative would have similar impacts on visual quality during the first 10 years of vegetation establishment at Frederick Allen Park. The alternative could result in greater benefits to visual quality from increased landscaping.	SU < The alternative would have similar impacts on visual quality during the first 10 years of vegetation establishment at Frederick Allen Park. The alternative could result in greater benefits to visual quality from use of natural materials and plants in lieu of concrete.
Air Quality	LTSM impact from air quality emissions and exposure to substantial pollutant concentrations LTS impact from conflict with an air quality plan and resulting in other emissions affecting a substantial number of people	No Impact	LTSM < The alternative would result in reduced emissions from reduced construction it still would require implementation of mitigation to avoid a potentially significant impact from substantial pollutant concentrations.	LTSM = The alternative would result in equivalent construction activity and emissions to the proposed project.	LTSM > The alternative would result in a slight increase in construction activity and emissions in Unit 2 as compared to the proposed project, though impacts would remain less than significant.

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
Biological Resources	LTSM impact on special-status species, riparian and sensitive natural communities, wetlands, conflicts with ordinance for protection of biological resources, and introduction of invasive species	No Impact: existing fish passage barriers would remain.	LTSM > The alternative would avoid short-term impacts from tree removal in Frederick Allen Park but would not achieve the long-term benefits to water quality and habitat from removal of the concrete channel and creation of a natural riparian habitat.	LTSM < The alternative would reduce the long-term impact from recreational access to the creek. The boardwalk would allow habitat creation underneath the boardwalk.	LTSM < The alternative would reduce the impact from new concrete structures in the Corte Madera Creek channel and floodplain.
Cultural Resources	LTSM impact on archaeological resources LTS impact on human remains	No Impact	LTSM < The alternative would have a low potential to encounter archaeological resources or human remains. The impact would be slightly less than theproposed project due to the reduced area of grading/earthwork.	LTSM = The alternative would have a low potential to encounter archaeological resources or human remains. The impact would be equivalent to the proposed project.	LTSM = The alternative would have a low potential to encounter archaeological resources or human remains. The impact would be equivalent to the proposed project.
Energy	LTS impact on energy supplies	No Impact	LTS < The alternative would require less energy use during construction	LTS = The alternative would require an equivalent amount of energy use to	LTS > The alternative could require slightly more energy to construct because of the potential

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
			because of reduced construction activity.	construct as the proposed project.	increased hauling of materials to construct the Unit 2 floodwall.
Geology and Soils	LTSM impact from geologic hazards LTS impact from loss of topsoil	No Impact	LTSM < The reduced construction area would have slightly less potential to cause geology and soils-related impacts from construction-related erosion and topsoil loss than the proposed project.	LTSM = The impact of geologic hazards from construction of a boardwalk would be equivalent to the impact from proposed project construction.	LTSM > The impact from geologic hazards and soil loss from construction of the non-concrete floodwall would be slightly greater than the proposed project.
Greenhouse Gas (GHG) Emissions	LTS impact from GHG emissions	No Impact	LTS <u>≤ ≥</u> The reduced construction in Frederick Allen Park would result in reduced GHG emissions <u>during construction, but the alternative would not achieve the long-term GHG reduction emissions</u>.	LTS = <u>≤</u> The construction intensity would be similar to the proposed project and would have similar GHG emissions. <u>The alternative would have greater GHG reduction benefits.</u>	LTS > The floodwall construction in Unit 2 would result in slightly greater hauling of material and slightly increased GHG emissions, compared to the proposed project.

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
Hazards and Hazardous Materials	LTS impact from transport and use of hazardous materials and flooding hazards	No Impact	LTS < The reduced area of construction would require slightly less use of hazardous materials and would not increase flooding of the bike path, compared to the proposed project.	LTS < Compared to the proposed project, the alternative would require an equivalent volume of hazardous materials (fuel) to construct. The alternative would avoid increased flooding of the bike path.	LTS = The alternative would require an equivalent volume of hazardous materials (fuel) to construct, compared to the proposed project. The alternative would not change exposure of the public to flood hazards.
Hydrology and Water Quality	LTSM impact from violation of water quality standards LTS impact on erosion and from flooding hazards	No Impact: ongoing flooding consequences would remain	LTSM > The alternative would avoid the impact from excavation and exposure of potentially contaminated soils. The alternative would result in greater, but LTS, long-term impacts on flooding on properties adjacent to Frederick Allen Park.	LTSM < The alternative would elevate the bike path above the floodplain and lessen the risk of flooding, compared to the proposed project. The alternative also would reduce the use of impervious surfaces.	LTSM < The alternative would result in a slight reduction in water quality impacts because of the use of natural materials in lieu of concrete.
Noise	LTSM impact from noise generation exceeding noise ordinances and generation of groundborne vibration	No Impact	LTSM < The alternative would avoid construction in Frederick Allen Park and would eliminate the associated potentially significant increase in	LTSM = The alternative would require an equivalent level of grading and construction activity and would result in similar noise and vibration,	LTSM = The alternative would require an equivalent level of grading and construction activity and would result in similar noise and vibration,

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
			noise levels and groundborne vibration.	compared to the proposed project.	compared to the proposed project.
Public Services	LTS impact on police, fire department, and other public services	No Impact	LTS = The alternative would have equivalent impacts on public services, compared to the proposed project.	LTS = The alternative would have equivalent impacts on public services, compared to the proposed project.	LTS = The alternative would have equivalent impacts on public services, compared to the proposed project.
Recreation	LTSM impact on recreational opportunity from reduced shade LTS impact from new recreational access and associated public access impacts on the creek	No Impact	LTS < The alternative would reduce the impact on recreational access because of avoidance of construction activities and modifications in Frederick Allen Park.	LTSM < The alternative would avoid impacts associated with public access to the creek and would reduce impacts on recreational access because the boardwalk would be elevated above the floodplain. The impact from loss of shade would be equivalent to the proposed project.	LTSM > The alternative would not modify any proposed project elements in Frederick Allen Park. The alternative would block access to an unofficial path at the location of the non-concrete floodwall in Unit 2 The impact would be greater than the proposed project.
Transportation and Circulation	LTSM impact from temporary closure of Bike Route 20 during construction in Frederick Allen Park	No Impact	LTS < The alternative would avoid closure of Bike Route 20 and associated temporarily significant impacts on bicycle and	LTSM < The alternative would result in equivalent short-term construction impacts for the new boardwalk in Frederick	LTSM = The alternative would not change any project elements that would affect transportation.

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
	LTS impact on vehicle miles traveled		pedestrian facilities, unlike the proposed project.	Allen Park. The boardwalk would be elevated above the floodplain and would reduce potential long-term impacts on bicycle access because of reduced flooding.	
Tribal Cultural Resources	LTSM impact on tribal cultural resources from inadvertent discovery	No Impact	LTSM = Would involve construction in areas with low potential to encounter tribal cultural resources, similar to the proposed project.	LTSM = Would involve construction in areas with low potential to encounter tribal cultural resources, similar to the proposed project.	LTSM = Would involve construction in areas with low potential to encounter tribal cultural resources, similar to the proposed project.
Utilities and Service Systems	LTS impact from relocation or construction of new utilities and exceedance of water supply, wastewater, or solid waste capacity	No Impact	LTS < The reduced construction area would result in slightly reduced temporary demand for utilities and service systems.	LTS = The alternative would have a comparable impact on utilities and service systems to the proposed project.	LTS = The alternative would have a comparable impact on utilities and service systems to the proposed project assuming that the rock protection of the RVSD sewer line is adequate.
Agriculture and Forestry, Land Use and Planning,	No impact on agriculture and	No Impact	No Impact < The alternative would avoid the temporary	LTS = The alternative would result in the same	LTS = The alternative would result in the same

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
Mineral Resources, Population and Housing, and Wildfire	forestry, land use, minerals, and wildfire LTS impact on dividing an established community during construction		impact from dividing an established community because Frederick Allen Park would remain open during construction.	impacts as the proposed project during construction in Frederick Allen Park.	impacts as the proposed project during construction in Frederick Allen Park.

Notes:

LTS = Less than significant impact

LTSM = Less than significant impact with mitigation incorporated

SU = Significant and unavoidable impact

< = alternative would reduce one or more impacts of the proposed project.

> = alternative would increase one or more impacts of the proposed project.

= = the proposed project and alternative impacts would be equivalent.

5.5 Environmentally Superior Alternative

CEQA requires that an environmentally superior alternative be identified. The environmentally superior alternative is the alternative that would result in the fewest or least significant environmental impacts while providing the greatest environmental benefits. If the No Project Alternative is the environmentally superior alternative, Section 15126.6(e)(2) of the CEQA Guidelines requires that another alternative that feasibly could attain most of the project's basic objectives be chosen as the environmentally superior alternative.

Although the No Project Alternative would avoid the short-term impacts of project construction, the No Project Alternative would result in a continuation of the existing flooding hazards throughout the Town of Ross and Kentfield area. This existing flooding hazard is a significant detriment to public safety and property. The No Project Alternative also would not address the lack of fish resting pools and insufficient fish and riparian habitat within the Corte Madera Creek concrete channel. These existing habitat impacts are significant. Although Alternative 1 would avoid the proposed project's significant and unavoidable short-term impact on visual quality during the first 10 years after construction, Alternative 1 would result in additional flooding impacts in the Town of Ross during the 100-year flood event and would have substantially reduced habitat benefits than the proposed project.

Alternative 2 would be the environmentally superior alternative because it would avoid the impacts related to recreation, hazards, and transportation from increased flooding on Bike Route 20. Alternative 2 also would reduce the LTS impact from creating a new pedestrian access to the creek and would allow increased riparian planting and infiltration of rainfall due to construction of an elevated boardwalk instead of a paved pathway. Alternative 2 also would meet all project objectives and feasibility criteria.

5.6 References

GHD. (2020, October 23). Scenario B2 Hydraulic Modeling.

Stetson Engineers. (2017). *Report on Hydraulic Modeling of Corte Madera Creek Option C for the Phoenix Lake.*

USACE. (2010). *Corte Madera Creek Flood Control Study Baseline Report.* San Francisco, CA: U.S. Army Corps of Engineers, San Francisco District.

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6 Report Preparation

6.1 List of Preparers

This section lists those individuals who either prepared or participated in the preparation of this EIR. The District and Town of Ross are serving as the CEQA lead agency and responsible agency for preparation of this EIR, respectively.

6.1.1 Marin County

Table 6.1-1 lists the individuals from the District that were involved in the preparation of this EIR.

Table 6.1-1 Marin Flood Control District and Planning Department

Contributor	Title
Marin County Flood Control and Water Conservation District	
Joanna Dixon	Project Manager
Liz Lewis	Water Resources Manager
Laurie Williams	Senior Planner
Liz Lotz	Resource Specialist GIS
Marin County Planning Department	
Rachel Reid	Planning Manager

6.1.2 Consultant Team

Consulting staff that contributed to this EIR are listed in Table 6.1-2.

Table 6.1-2 Consultant Teams

Contributor	Title	Role/Resource Section
Panorama Environmental, Inc.		
Susanne Heim	Project Manager	Quality Assurance/Quality Control, Project Description, Alternatives, Public Outreach, Project Management
Stephanie Klock	Deputy Project Manager	Project Management, Quality Control
Rita Wilke	Senior Environmental Scientist	Project Description, Alternatives

Contributor	Title	Role/Resource Section
Whitney Broeking	Senior Environmental Scientist	Aesthetics and Visual Resources, Recreation
Caitlin Gilleran	Senior Environmental Scientist	Air Quality and Greenhouse Gas Emissions
Geoff Hornek	Noise Specialist	Noise measurements and modeling
Christina Kossa	Visual Specialist	Visual Simulations
Corey Fong	GIS Manager	GIS, Graphics
Tali Ashurov	Environmental Planner II	Agriculture and Forestry, Energy, Land Use and Planning, Population and Housing, Public Services, Transportation and Circulation, Utilities and Service Systems
Yingying Cai	Environmental Planner I	Geology and Soils, Hazards and Hazardous Materials, Mineral Resources, Noise, Socioeconomics, Wildfire, Growth-Inducing and Cumulative
GHD		
Raymond Wong, Ph.D.	Sr. Engineer/Project Manager	Engineering, Hydraulic Modeling, Project Management, Project Description
Seth Stevens	Civil Engineer	Engineering, Project Description
Tonya Redfield	Senior Project Manager	Project Management
Greg Garrison	Civil Engineer/Hydrologist	Hydraulic Modeling
Jessica Hall	Landscape Architect	Visual Simulation, Planting Plan
Horizon Water and Environment		
Ken Schwarz, Ph.D.	Principal	Hydrology
Brian Piontek	Senior Associate	Hydrology
Johnnie Chamberlin	Associate	Hydrology
Jennifer Schulte, Ph.D.	Air Quality Expert	Health Risk Assessment
Janis Offerman, RPA	Director Cultural Resources	Cultural Resources and Tribal Cultural Resources
Stillwater Sciences		
Dennis Halligan	Senior Fisheries Biologist	Biological Resources – Aquatic
Megan Keever	Senior Botanist	Biological Resources - Plants
Holly Burger	Senior Wildlife Biologist	Biological Resources - Terrestrial Wildlife
Mike Love & Associates		
Mike Love	Principal Engineer	Fish passage evaluation/design

Contributor	Title	Role/Resource Section
Sicular Consulting		
Dan Sicular	Principal	EIR Review

6.2 Agencies and Organizations Contacted

Federal, state, and local agencies and tribes consulted during the preparation of the EIR are listed in Table 6.2-1.

Table 6.2-1 Agencies and Organizations Consulted

Agency or Organization	Person Consulted
Federal	
United States Army Corps of Engineers	Nicholas Malsavage Duke Roberts Holly Costa John Conway Roberta Morganstern
National Marine Fisheries Services	Sara Azat
State	
California Department of Fish and Wildlife	Mandy Culpepper Karen Weiss
Regional Water Quality Control Board	Nicole Fairley
State Lands Commission	Eric Gillies
Local	
Town of Ross	Richard Simonitch Joe Chinn Patrick Streeter
Ross Valley Sanitation District	Stephen Miksis Steve Moore Philip Benedetti
Non-Governmental Organization	
Friends of Corte Madera Creek	Sandra Guldman Nick Salcedo
Tribes	
Federated Indians of Graton Rancheria	Buffy McQuillen

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Appendices

Appendix A	**Notice of Preparation and Scoping Summary Report**
Appendix B	**Tree Removal Table and Landscaping Planting Plans**
Appendix C	**Air Quality Supporting Information**
Appendix D	**Biological Resources Supporting Information**
Appendix E	**Supplemental Water Surface Elevation Change Maps**
Appendix F	**Tribal Consultation Supporting Information**
Appendix G	**Mitigation Monitoring and Reporting Program**

Appendix A

Notice of Preparation and Scoping Summary Report

Notice of Preparation

Notice of Preparation and Scoping Session

Corte Madera Creek Flood Risk Management Project, Phase 1 Environmental Impact Report

Applicant: Marin County Flood Control and Water Conservation District

Project Address: Corte Madera Creek Watershed in the Town of Ross and unincorporated Kentfield

Project Manager: Joanna Dixon **Email:** cortemaderacreek@marincounty.org

Project Summary: The Marin County Flood Control and Water Conservation District (the District) proposes the Corte Madera Creek Flood Risk Management Project, Phase 1 (the project). The project will make improvements to the concrete channel that the US Army Corps of Engineers built in the 1960s. The proposed channel improvements provide protection from the 25-year flood event to residents and businesses within the Town of Ross and Kentfield and improve fish passage and habitat. Additional information about the project is available at: https://bit.ly/30FILcR

Date and time of (web-based) Scoping Session: August 27, 2020 6 p.m. to 8 p.m.

Zoom Link: https://us02web.zoom.us/j/85658763657 **Meeting ID:** 856 5876 3657

Passcode: 799931 **Phone Number:** +1 669-900-9128

Last Day to Submit Comments: September 18, 2020 at 5 p.m.

Scoping Session Materials: Available after the scoping meeting on the project website at: https://bit.ly/30FILcR

All public meetings and events sponsored or conducted by the County of Marin are held in accessible sites. Requests for accommodations may be made by calling (415) 473-4381 (Voice) 473-3232 (TDD/TTY) or by e-mail at disabilityaccess@marincounty.org at least five business days in advance of the event. Copies of documents are available in alternative formats, upon request.

Marin County Flood Control and Water Conservation District
c/o: Panorama Environmental, Inc.
717 Market Street, Suite 650
San Francisco, CA 94103

[Recipient Address]

Scoping Summary Report

Responses to Notice of Preparation

This appendix contains written responses to letters received by the Marin County Flood Control & Water Conservation District (the District) in response to the Notice of Preparation (NOP), of a Draft EIR for the Corte Madera Creek Flood Risk Management Project, Phase 1. Publication of the NOP on August 21, 2020 started the CEQA 30-day scoping period, during which the District received comments from responsible and trustee agencies and the public about the scope and range of alternatives that should be analyzed in the EIR. Also included are responses to comments received during the virtual scoping meeting held on August 27, 2020. Sixteen written comment letters were received, and fourteen speakers provided comments during the scoping meeting. The 30-day scoping period closed on September 21, 2020. Table A- 1 includes a summary of the comments received by the District for the EIR in response to the NOP. Responses to the comments are provided in the table.

The comment letters received on the NOP follow Table A- 1.

Table A- 1 Summary of Public Comments Received in Response to the NOP

Date	Commenter (Organization)	Comments	EIR Topic and Section
		State Agencies	
September 21, 2020	CDFW	Various comments regarding Project Description, Biological Resources, and alternatives. Refer to letter for specific comments (clearly organized by topic).	• Comment noted
		Recommends incorporating the long-term (end of century) scenarios for sea level rise, beyond the 15 year estimate, to fully evaluate Project impacts.	• Section 3.9 Hydrology and Water Quality
		The CEQA Guidelines (§§15124 and 15378) require that the draft EIR incorporates a full project description, including reasonably foreseeable future phases of the Project, and that it contains sufficient information to evaluate and review the Project's environmental impact. Please include a complete description of the following Project components in the Project description: - Footprints of permanent Project features and temporarily impacted areas, such as staging areas and access routes - Encroachments into riparian habitats, wetlands, or other sensitive areas - Area and plans for the proposed floodwalls, ground disturbing activities, channel fill removal, fencing, paving, stationary machinery, landscaping, stormwater systems, and any other construction activities - Operational features of the Project, including level of anticipated human presence (describe seasonal or daily peaks in activity, if relevant), artificial lighting/light reflection, noise and greenhouse gas generation, traffic generation, and other features - Construction schedule, activities, equipment, and crew sizes - Dewatering and species relocation plan, including species likely to be encountered	• Chapter 2 Project Description • Section 3.3 Biological Resources, Impact 3.3-1, Impact 3.3-2 • Chapter 4 Growth Inducing and Cumulative Effects

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Sufficient information regarding the environmental setting is necessary to understand the Project's, and its alternative's (if applicable), significant impacts on the environment (CEQA Guidelines, §§15125 and 15360). CDFW recommends that the CEQA document prepared for the Project provide baseline habitat assessments for special-status plant, fish, and wildlife species located and potentially located within the Project area and surrounding lands, including all rare, threatened, or endangered species (CEQA Guidelines, §15380). Fully protected, threatened or endangered, candidate, and other special-status species that are known to occur, or have the potential to occur in or near the Project site, include, but are not limited to: Coho salmon south of Punta Gorda (Oncorhynchus kisutch), state and federally listed as endangered: - California Ridgway's rail (Rallus obsoletus obsoletus), state and federally listed as endangered, and a Fully Protected Species - Salt-marsh harvest mouse (Reithrodontomys raviventris), state and federally listed as endangered, and a Fully Protected Species - California black rail (Laterallus jamaicensis coturniculus), state listed as threatened and a Fully Protected Species - Central California Coast Distinct Population Segment steelhead (Oncorhynchus mykiss irideus pop. 8), federally listed as threatened - California red-legged frog (Rana draytonii), federally listed as threatened and a California Species of Special Concern (SSC) - Foothill yellow-legged frog (Rana boylii), SSC - Western pond turtle (Emys marmorata), SSC - Pallid bat (Antrozous pallidus), SSC - White-tailed kite (Elanus leucurus), Fully Protected Species	• Section 3.3 Biological Resources • Appendix D

Date	Commenter (Organization)	Comments	EIR Topic and Section
		- Napa false indigo (Amorpha californica var. napensis), California Rare Plant Rank 1B	
		Habitat descriptions and species profiles should include information from multiple sources, including: aerial imagery, historical and recent survey data, field reconnaissance, scientific literature and reports, and findings from positive occurrence databases such as the California Natural Diversity Database (CNDDB). Based on the data and information from the habitat assessment, the CEQA document can then adequately assess which special-status species are likely to occur in the Project vicinity.	• Section 3.3 Biological Resources
		CDFW recommends that prior to Project implementation, surveys be conducted for special-status species with potential to occur, following recommended survey protocols if available. Survey and monitoring protocols and guidelines are available at: https://www.wildlife.ca.gov/Conservation/Survey-Protocol.	• Section 3.3 Biological Resources, Impact 3.3-1
		Botanical surveys for special-status plant species, including those with a California Rare Plant Rank (http://www.cnps.org/cnps/rareplants/inventory/), must be conducted during the blooming period for all sensitive plant species potentially occurring within the Project area and require the identification of reference populations. Please refer to CDFW protocols for surveying and evaluating impacts to rare plants available at: https://www.wildlife.ca.gov/Conservation/Plants.	• Section 3.3 Biological Resources, Impact 3.3-1
		The Project takes place along an urbanized corridor of Corte Madera Creek with residential, business, and community structures developed near the creek. The upstream segments of the Project provide freshwater habitat and a riparian corridor composed mostly of hardwood trees (CDFW 2009).	• Section 3.3 Biological Resources

Date	Commenter (Organization)	Comments	EIR Topic and Section
		The farthest downstream segment of the Project is tidally influenced and transitions to tidal wetland with fewer riparian trees. Corte Madera Creek is designated critical habitat for the state and federally listed as endangered Coho salmon South of Punta Gorda and the federally listed as threatened Central California Coast Distinct Population Segment steelhead. Corte Madera Creek is also designated essential fish habitat for various life stages of salmon. Steelhead are present in the creek and Coho have historically utilized the watershed.	
		The quality of Corte Madera Creek as a migration corridor for steelhead and Coho was degraded by the construction of the concrete flood control channel and the installation of the Denil fish ladder, a partial barrier to passage. The upstream portion of the concrete channel, identified as Unit 3, contains 28 evenly spaced concrete pools intended to function as resting pools for migrating salmonids installed when the concrete flood channel was constructed by the Army Corps of Engineers. However, most of the pools fail to reduce flow velocity and provide inadequate cover. Only a few of the existing pools provide suitable resting habitat, and migration is extremely challenging to steelhead currently utilizing the channel. The construction of the flood control channel was likely a contributing factor to Coho salmon's extirpation (Love et al. 2007).	• Section 3.3.3 Biological Resources
		Based on reviewing the Phase 1 Project Information Sheet, CDFW looks forward to reviewing the resting pool proposals throughout Unit 3 of the Project. CDFW recommends that improvement of fisheries habitat and fish passage be included as part of the planning objectives for developing and analyzing alternatives. CDFW recommends including an alternative that	• Chapter 2 Project Description • Chapter 5 Alternatives

Date	Commenter (Organization)	Comments	EIR Topic and Section
		includes an improvement for all 28 resting pools to address fish passage in Unit 3.	
		Specifically, CDFW recommends that the draft EIR incorporate recommendations proposed in the Corte Madera Creek Flood Control Channel Fish Passage Assessment and Alternatives Analysis (Love, 2007). Remediation of the fish passage impediments in Unit 3 by incorporating treatments into the concrete channel, such as those presented in Love (2007), would provide suitable upstream fish passage under the range of anticipated tidal and streamflow conditions through all of Unit 3. The Love report states that the preferred alternative design for resting pools would improve fish passage from 2% to 78% for low flows, and from 1% to 65% for high flows, vastly improving the ability for fish passage during high and low flows. Incorporating the 2007 Love report offers the opportunity for both remediation of impacts to steelhead and Coho, while also providing flood risk management to protect life and property.	• Chapter 2 Project Description • Section 3.3 Biological Resources
		The CEQA Guidelines (§15126.2) necessitate that the draft EIR discuss all direct and indirect impacts (temporary and permanent) that may occur with implementation of the Project. This includes evaluating and describing impacts such as: - Potential for "take" of special-status species - Loss or modification of breeding, nesting, dispersal and foraging habitat, including vegetation removal, alteration of soils and hydrology, and removal of habitat structural features (e.g. snags, roosts, overhanging banks) - Permanent and temporary habitat disturbances associated with ground disturbance, noise, lighting, reflection, air pollution, traffic or human presence	• Chapter 3 Environmental Setting, Impacts, and Mitigation Measures • Section 3.3.6 Biological Resources

Date	Commenter (Organization)	Comments	EIR Topic and Section
		- Obstruction of movement corridors, fish passage, or access to water sources and other core habitat features	
		The CEQA document should also identify reasonably foreseeable future projects in the Project vicinity, disclose any cumulative impacts associated with these projects, determine the significance of each cumulative impact, and assess the significance of the Project's contribution to the impact (CEQA Guidelines, §15355). Although a project's impacts may be insignificant individually, its contributions to a cumulative impact may be considerable; a contribution to a significant cumulative impact – e.g., reduction of available habitat for a listed species – should be considered cumulatively considerable without mitigation to minimize or avoid the impact.	• Chapter 4 Growth-Inducing and Cumulative Effects
		Based on the comprehensive analysis of the direct, indirect, and cumulative impacts of the Project, the CEQA Guidelines (§§ 15021, 15063, 15071, 15126.2, 15126.4 and 15370) direct the lead agency to consider and describe all feasible mitigation measures to avoid potentially significant impacts in the draft EIR, and/or mitigate significant impacts of the Project on the environment. This includes a discussion of take avoidance and minimization measures for special-status species, which are recommended to be developed in early consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and CDFW. These measures can then be incorporated as enforceable Project conditions to reduce potential impacts to biological resources to less-than-significant levels. Fully protected species such as California Ridgway's rail, California black rail, and salt marsh harvest mouse, may not be taken or possessed at any time (Fish and Game Code § 3511). Therefore, the draft EIR is advised to	• Section 3.3 Biological Resources, Impact 3.3-1

Date	Commenter (Organization)	Comments	EIR Topic and Section
		include measures to ensure complete take avoidance of these fully protected species.	
		CDFW is available to provide biological Mitigation Measures for fully protected species and other special-status species, including California Ridgeway's rail, California black rail, salt marsh harvest mouse, California red-legged frog and foothill yellow-legged frog, western pond turtle, bats, special-status plants, and nesting birds to name a few.	• Comment noted
		Based on our virtual meeting on September 17, 2020, CDFW is pleased that you will be incorporating the tree replacement ratios provided by CDFW: Oak trees: - 4:1 replacement for trees 5 to 10 inches diameter at breast height (DBH) - 5:1 replacement for trees greater than 10 inches to 15 inches DBH - 15:1 replacement for trees greater than 15 inches DBH, which are considered old-growth oaks Replacement oaks will come from nursery stock grown from locally sourced acorns, or from acorns gathered locally, preferably from the same watershed in which they are planted.	• Section 3.3 Biological Resources, Impact 3.3-2
		Other tree species greater than or equal to 6 inches DBH will be mitigated at the following ratios: - 1:1 replacement for non-native trees - 3:1 replacement for native trees	• Section 3.3 Biological Resources, Impact 3.3-2
		CDFW considers riparian habitat a sensitive plant community that is valuable for a diversity of wildlife species. Riparian zones maintain shade (which is especially important for regulating water temperatures for fish), protect against windthrow, produce litterfall, provide important migratory	• Project Description • Section 3.3 Biological Resources, Impact 3.3-2 • Chapter 5 Alternatives

Date	Commenter (Organization)	Comments	EIR Topic and Section
		routes for wildlife, and serve to recruit instream woody debris which provides habitats, food and shelter for invertebrates and fish. Riparian vegetation also acts as a filter strip for sedimentation from erosion sources. Based on the virtual meeting on September 17, 2020, CDFW is concerned with the placement of up to 10-foot high flood walls along long portions of the Project. CDFW recommends a buffer between the wall and the creek and recommends the area be planted with native riparian vegetation of all types, including grasses, herbs, vines, shrubs, and trees, with trees being utilized to the maximum extent possible.	
		The Project area should be revegetated and restored within the same season as construction following a Restoration Plan accepted in writing by CDFW. CDFW recommends habitat mapping and tree surveys be conducted to refine potential impacts prior to submitting the Restoration Plan. CDFW is available to work with the County to determine an appropriate offsite planting location as well.	• Section 3.3 Biological Resources, Impact 3.3-2
		Both the on-site and potentially off-site Restoration Plan should monitor and maintain, as necessary, all plants for a minimum of ten (10) years to ensure successful revegetation. Planted trees and other vegetation should each have a minimum of 85 percent survival at the end of five years. If revegetation survival and/or cover requirements do not meet established goals, replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements should occur. Replacement plants should be monitored with the same survival and growth requirements for five years after planting.	• Section 3.3 Biological Resources, Impact 3.3-2
		Any proposed regrading in the draft EIR should assess impacts, and at a minimum, be designed to maintain existing year-round instream habitat. The analysis should include the	• The bypass outlet was part of the original USACE project and is no longer being proposed.

Date	Commenter (Organization)	Comments	EIR Topic and Section
		geomorphology of the creek upstream of the bypass outlet. CDFW recommends a critical riffle analysis utilizing CDFW's Standard Operating Procedure for Critical Riffle Analysis for Fish Passage in California. This may include addressing fish passage design criteria, sediment transport, design storm elevations, scour potential, and shear stress involved in the bypass structure.	• The regrading in Unit 4 and adjacent to Frederick Allen Park is designed to maintain and expand year-round instream habitat.
		CDFW recommends implementing guidance and recommendations from the California Salmonid Stream Habitat Restoration Manual. Fish passage should include rearing, foraging, osmoregulation, smoltification, and related functions necessary to support fish through a range of life stages. Avoid use of heavy geotextile fabric and minimize the use of rock riprap to the extent feasible to achieve bank stabilization. If fabric is needed, it should be made of natural, biodegradable materials. Stabilization should be achieved through integration of biological bank stabilization methods, including use of live willow cuttings and other appropriate native species.	• Chapter 2 Project Description
		Fish and Game Code section 5901 states that unless authorized, it is unlawful to construct or maintain a device that prevents or impedes the passing of fish up and downstream. Fish and Game Code section 45 defines "fish" as wild fish, mollusks, crustaceans, invertebrates, or amphibians, including any part, spawn or ova thereof.	• Comment noted
		Please coordinate with CDFW for technical support and assistance. CDFW supports channel naturalization and the restoration of habitat and channel complexity to support fisheries and a broad range of aquatic and riparian wildlife.	• Comment noted

Date	Commenter (Organization)	Comments	EIR Topic and Section
		The State of California Sea-Level Rise Guidance/2018 Update (California Natural Resources Agency 2018) provides a science-based methodology for state and local governments to analyze and assess the risks associated with sea-level rise and incorporate sea-level rise into their planning, permitting, and investment decisions. The Marin Shoreline Sea Level Rise Vulnerability Assessment/Bay Waterfront Adaptation & Vulnerability Evaluation (BayWAVE) (Marin County 2017) provides context and estimates of the physical and fiscal impacts across the County's bayside shoreline over the coming decades. It includes sea level rise scenarios ranging from 10 inches in the near-term (15 years) to 20 inches in the medium-term (mid-century) and to 60 inches in the long-term (end of century). Since the purpose of the Project is to reduce long-term flood risk, and a portion of this downstream channel is tidal, CDFW recommends incorporating the long-term (end of century) scenarios for sea level rise, beyond the 15 year estimate, to fully evaluate Project impacts.	• Section 3.9 Hydrology and Water Quality 3.9.3 Environmental Setting – Sea Level Rise; 3.9.5 Approach to Impact Analysis
		Please be advised that a CESA ITP must be obtained if the Project has the potential to result in take3 of plants or animals listed under CESA, either during construction or over the life of the Project. Issuance of a CESA Permit is subject to CEQA documentation; the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the Project will impact CESA listed species, early consultation is encouraged, as significant modification to the project and mitigation measures may be required in order to obtain a CESA ITP.	• Comment noted
		CEQA requires a Mandatory Finding of Significance if a project is likely to substantially restrict the range or reduce the population of a threatened or endangered species. (Pub. Resources Code, §§ 21001, subd. (c), 21083; CEQA Guidelines,	• Comment noted

Date	Commenter (Organization)	Comments	EIR Topic and Section
		§§ 15380, 15064, and 15065). Impacts must be avoided or mitigated to less-than-significant levels unless the CEQA Lead Agency makes and supports Findings of Overriding Consideration (FOC). The CEQA Lead Agency's FOC does not eliminate the project proponent's obligation to comply with CESA.	
		CDFW requires an LSA Notification, pursuant to Fish and Game Code section 1600 et. seq., for Project activities affecting lakes or streams and associated riparian habitat. Notification is required for any activity that may substantially divert or obstruct the natural flow; change or use material from the bed, channel, or bank including associated riparian or wetland resources; or deposit or dispose of material where it may pass into a river, lake or stream. Work within ephemeral streams, washes, watercourses with a subsurface flow, and floodplains are subject to notification requirements. CDFW will consider the CEQA document for the Project and may issue an LSA Agreement. CDFW may not execute the final LSA Agreement until it has complied with CEQA as a Responsible Agency.	• LSA Agreement requirements are included in Table 2.8-1 Required Permits or Approvals for the Project in Chapter 2 Project Description
		CDFW also has authority over actions that may disturb or destroy active nest sites or take birds without authorization. Fish and Game Code sections protecting birds, their eggs, and nests include sections 3503, 3503.5, and 3513. Fully protected species may not be taken or possessed at any time (Fish and Game Code, § 3511). Migratory birds are also protected under the federal Migratory Bird Treaty Act.	• Comment noted
		CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any	• Comment noted

Date	Commenter (Organization)	Comments	EIR Topic and Section
		special-status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form, online field survey form, and contact information for CNDDB staff can be found at the following link: https://wildlife.ca.gov/data/CNDDB/submitting-data.	
		The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089).	• Comment noted
September 21, 2020	California State Lands Commission	Various comments regarding Project Description, Biological Resources, GHG, and Cultural Resources. Refer to letter for specific comments (clearly organized by resource topic).	• Comment noted
		Request Draft EIR include information concerning the potential effects of sea-level rise, including adverse effects on public access.	• Section 3.9 Hydrology and Water Quality, 3.9.5 Approach to Impact Analysis
		The California State Lands Commission (Commission) staff has reviewed the subject NOP for an EIR for the Corte Madera Creek Flood Risk Management Project, Phase 1 (Project), which is being prepared by the Marin County Flood Control and Water Conservation District (District). The District, as the public agency proposing to carry out the Project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The Commission is a trustee agency for projects that could directly or indirectly affect State sovereign land and their accompanying Public Trust resources or uses. Additionally, because the Project	• Chapter 1 Introduction

Date	Commenter (Organization)	Comments	EIR Topic and Section
		involves work on State sovereign land, the Commission will act as a responsible agency. Commission staff requests that the District consult with us on preparation of the Draft EIR as required by CEQA section 21153, subdivision (a), and the State CEQA Guidelines section 15086, subdivisions (a)(1) and (a)(2).	
		The Commission has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The Commission also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, sub d. (c); 6009.1; 6301; 6306). All tidelands and submerged lands granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine.	• Chapter 1 Introduction
		After review of the information contained in the NOP, Commission staff has determined that the waterway, over which the proposed Project will extend, includes State-owned sovereign land, as specified above. On April 25, 1968, the Commission authorized Lease No. PRC 3926 to the Marin County Flood Control and Water Conservation District for the construction of a flood control channel northwesterly of the Bon Air Bridge. This lease expired in 2017. Therefore, a new lease application is required.	• Lease requirements are included in Table 2.8-1 Required Permits or Approvals in Chapter 2 Project Description.
		From the Project Description, Commission staff understands that the Project would include the following component that has the potential to affect State sovereign land: - Unit 2. Enhancement of the Creek habitat by replacing the concrete channel with an earthen channel and vegetation downstream of Stadium Way. - Submerged lands downstream of Stadium Way are considered State sovereign land. Modifying the channel	• Chapter 2 Project Description

Date	Commenter (Organization)	Comments	EIR Topic and Section
		would include removal of the concrete channel and installation of vegetated and unvegetated rock slope protection.	
		Project Description: A thorough and complete Project Description should be included in the Draft EIR in order to facilitate meaningful environmental review of potential impacts, mitigation measures, and alternatives. The Project Description should be as precise as possible in describing the details of all allowable activities (e.g., types of equipment or methods that may be used, maximum area of impact or volume of sediment removed or disturbed, seasonal work windows, locations for material disposal, etc.), as well as the details of the timing and length of activities. In particular, illustrate on figures and engineering plans and provide written description of activities occurring below the mean high tide line for Project area waterways. For the work in Unit 2, describe how the Creek would be dewatered prior to concrete removal. Thorough descriptions will facilitate Commission staff's determination of the extent and locations of its leasing jurisdiction, make for a more robust analysis of the work that may be performed, and minimize the potential for subsequent environmental analysis to be required.	• Chapter 2 Project Description
		For land under the Commission's jurisdiction, the Draft EIR should disclose and analyze all potentially significant effects on sensitive species and habitats in and around the Project area, including special-status wildlife, fish, and plants, and if appropriate, identify feasible mitigation measures to reduce those impacts. The District should conduct queries of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database and U.S. Fish and Wildlife Service's (USFWS) Special Status Species Database to identify any special-status plant or	• Section 3.3 Biological Resources • Refer to responses to CDFW comments below.

Date	Commenter (Organization)	Comments	EIR Topic and Section
		wildlife species that may occur in the Project area. The Draft EIR should also include a discussion of consultation with the CDFW, USFWS, and National Marine Fisheries Service (NMFS) as applicable, including any recommended mitigation measures and potentially required permits identified by these agencies.	
		Invasive Species: One of the major stressors in California waterways is introduced species. Therefore, the Draft EIR should consider the Project's potential to encourage the establishment or proliferation of aquatic invasive species (AIS) such as the quagga mussel, or other nonindigenous, invasive species including aquatic and terrestrial plants. For example, construction boats and barges brought in from long stays at distant projects may transport new species to the Project area via hull biofouling, wherein marine and aquatic organisms attach to and accumulate on the hull and other submerged parts of a vessel. If the analysis in the Draft EIR finds potentially significant AIS impacts, possible mitigation could include contracting vessels and barges from nearby, or requiring contractors to perform a certain degree of hull-cleaning. The CDFW's Invasive Species Program could assist with this analysis as well as with the development of appropriate mitigation (information at https://www.wildlife.ca.gov/Conservation/Invasives).	• Section 3.3 Biological Resources, Impact 3.3-1 and Impact 3.3-7
		Construction Noise: The Draft EIR should also evaluate noise and vibration impacts on fish and birds from construction and restoration activities in the water. Mitigation measures could include species-specific work windows as defined by CDFW, USFWS, and NMFS. Again, staff recommends early consultation with these agencies to minimize the impacts of the Project on sensitive species.	• Section 3.3 Biological Resources, Impact 3.3-1

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Greenhouse Gas (GHG): A GHG emissions analysis consistent with the California Global Warming Solutions Act (Assembly Bill [AB] 32) and required by the State CEQA Guidelines should be included in the Draft EIR. This analysis should identify a threshold for significance for GHG emissions, calculate the level of GHGs that will be emitted as a result of construction and ultimate build-out of the Project, determine the significance of the impacts of those emissions, and, if impacts are significant, identify mitigation measures that would reduce them to the extent feasible. For the proposed Project, the removal and disposal of the concrete in Unit 2 may result in substantial emissions.	• Section 3.7 Greenhouse Gas Emissions • Appendix C
		Sea-Level Rise: A tremendous amount of State-owned lands and resources under the Commission's jurisdiction will be impacted by rising sea levels. Because of their nature and location, these lands and resources are already vulnerable to a range of natural events, such as storms and extreme high tides. The State of California released the 2018 Update to the Safeguarding California Plan in January 2018 to provide policy guidance for state decision-makers as part of continuing efforts to prepare for climate risks. The Safeguarding Plan sets forth "actions needed" to safeguard ocean and coastal ecosystems and resources as part of its policy recommendations for state decision-makers. In addition, Governor Brown issued Executive Order B-30-15 in April 2015, which directs state government to fully implement the Safeguarding Plan and factor in climate change preparedness in planning and decision making. Commission staffbelieves the goals of the proposed Project are consistent with the guidance and recommendations presented in the Safeguarding Plan, and that Project would benefit coastal management agencies' efforts to plan for more resilient shorelines and minimize adverse ecosystem impacts resulting	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology

Date	Commenter (Organization)	Comments	EIR Topic and Section
		from sea-level rise. Please note that when considering lease applications, Commission staff will (1) request information from applicants concerning the potential effects of sea-level rise on their proposed projects, (2) if applicable, require applicants to indicate how they plan to address sea-level rise and what adaptation strategies are planned during the projected life of their projects, and (3) where appropriate, recommend project modifications that would eliminate or reduce potentially adverse impacts from sealevel rise, including adverse impacts on public access. Therefore, this information should be included in the Draft EIR.	
		The Draft EIR should also mention that the title to all abandoned archaeological sites and historic or cultural resources on or in the submerged lands of California is vested in the state and under the jurisdiction of the Commission (Pub. Resources Code, § 6313). Commission staff requests that the District consult with Staff Attorney Jamie Garrett, should any cultural resources on State lands be discovered during construction of the proposed Project. In addition, Commission staff requests that the following statement be included in the EIR's Mitigation and Monitoring Plan: "The final disposition of archaeological, historical, and paleontological resources recovered on state lands under the jurisdiction of the California State Lands Commission must be approved by the Commission."	• Section 3.4 Cultural Resources, Impact 3.4-2
		Local Agencies	
September 17, 2020	Town of Ross	The Town of Ross, as a major stakeholder, a responsible agency, and as a partner, wants to ensure that the level of information and analysis provided by the EIR is sufficient to adequately evaluate the potential project impacts that are likely to occur within the Town.	• Comment noted. The impact analysis is broken down by project element where impacts would different between areas. This approach to analysis is used to provide clarity to the public

Date	Commenter (Organization)	Comments	EIR Topic and Section
			regarding the location of potential project impacts.
		The EIR must analyze an alternative that proposes removal of the fish ladder with a nominal transition back to the existing concrete channel and little or no impact to the existing Frederick Allen Park (i.e. the "fish ladder only" alternative)	• Chapter 5 Alternatives. Note, this alternative is referred to as the Reduced Footprint: Avoid Frederick Allen Park Alternative. An alternative that only removes the fish ladder and involves no other construction within the Corte Madera Creek channel or other areas in Units 2 and 3 was considered, but rejected as discussed in Chapter 5.
		The EIR project description, goals, and objectives should be written such that they do not preclude the approval of a "fish ladder only" alternative for the portions of the project within the Town of Ross.	• Chapter 5 Alternatives. See response to prior comment.
		The EIR must provide adequate and detailed information and mitigation measures related to the extent of grading, tree removal and replacement, landscaping, and continued pedestrian and bicycle access. The existing Park has established mature vegetation and provides tree covered pedestrian and bicycle access from Kentfield to the Town of Ross along the creek corridor and the resultant project will result in a more open corridor that has limited vegetation and relief from sun exposure for people and fish. The EIR should identify all the potential CEQA impacts related to replacing the existing Park with the proposed floodplain park including the following information: • Earth disturbance and quantity of cubic yards of off-haul. • A detailed list of the type, number, size, and location of trees to be removed within the Park and within the overall Riparian Corridor. • The impact of sediment buildup within the proposed	• Chapter 2 Project Description • Section 3.3 Biological Resources, Impact 3.3-2 • Section 3.12 Recreation, Impact 3.12-3 • Appendix B Planting Plan • Section 3.9 Hydrology and Water Quality, Impact 3.9-2

Date	Commenter (Organization)	Comments	EIR Topic and Section
		floodplain and associated maintenance responsibilities. • A project diagram showing the specific locations of the walls within the Frederick Allen Park Corridor and the proposed creek streambed that meanders through the Corridor should be provided. • A fencing plan and where construction staging, and storage of materials will be located. • Maintenance responsibilities of the proposed floodplain and the park.	
		• Number of trees and species to be removed and replanted in Frederick Allen Park and within the overall Riparian Corridor. • The impacts related to the lack of shade and habitat during the initial years of growth of younger replacement trees including at completion of construction, at 5 years after, and at 10 years after construction.	• Chapter 2 Project Description • Section 3.3 Biological Resources, Impact 3.3-2 • Section 3.1 Aesthetics, Impact 3.1-2
		• The impact of sediment buildup within the proposed floodplain and associated maintenance responsibilities	• Chapter 2 Project Description • Section 3.9 Hydrology and Water Quality
		• The location and amount of pedestrian and multi-purpose paths.	• Chapter 2 Project Description
		• Mechanisms and procedures to keep the public safe during high water events.	• Chapter 2 Project Description • Section 3.8 Hazards and Hazardous Materials, Impact 3.8-4
		The EIR should illustrate the comparison of the 10-year and the 25-year flood risk reduction benefits under existing, existing with cumulative impacts, and proposed project conditions for all alternatives and including the "fish ladder only" alternative for the entire reach of Corte Madera Creek between San Anselmo and Kentfield and including all drainage tributaries within Ross.	• Section 3.9 Hydrology and Water Quality, Impact 3.9-5 • Chapter 5 Alternatives

Date	Commenter (Organization)	Comments	EIR Topic and Section
		The EIR should recognize the Town of Ross as both an integrated regulatory agency in the review process for design and construction activities, and as a landowner pertaining to Fredrick Allen Park and that the Town of Ross Planning, Building, and Public Works Departments are included in the appropriate sections as having regulatory jurisdiction within the Town limits and public rights of way.	• Chapter 1 Introduction • Chapter 2 Project Description
		Organizations	
September 21, 2020	Marin Conservation League	What would be the impacts to adjacent and nearby properties if the proposed flood control and ecosystem measures are not implemented at Frederick Allen Park?	• Chapter 5 Alternatives
		Does the Project modeling and planning take into account the likelihood of greatly increased extreme storms and rainfall and how could these affect Project efficacy?	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology
		What effect if any would the proposed Project have on sediment accumulation in the concrete channel and downstream in the natural channel bed?	• Section 3.9 Hydrology and Water Quality, Impact 3.9-2
		How do elements of the Project affect flood risk on Kent Avenue?	• Section 3.9 Hydrology and Water Quality, Impact 3.9-5
		Would the Granton Park floodwall or pump station – or any other aspect of the Project - affect, either increase or alleviate, flood risk along Kent Avenue, which runs parallel to the creek opposite to Granton Park?	• Section 3.9 Hydrology and Water Quality, Impact 3.9-5
September 21, 2020	Marin Audubon Society	Removing the concrete channel has been far too long in coming. This channel has minimal to no habitat value and has not even done much for flooding.	• Comment noted
		The project would have many environmental benefits. It would restore much of the creek to a more natural condition,	• Comment noted

Date	Commenter (Organization)	Comments	EIR Topic and Section
		improve riparian habitat, remove the concrete lining, remove the inadequate fish ladder, and improve fish resting pools	
		Suggest that designs for the floodwalls be considered that would provide some habitat value. For a sea wall project it is considering, the Port of San Francisco has researched designs for walls that have spaces of various size and shapes that can support aquatic habitat, vegetation and small creatures. While the Corte Madera Creek walls are not inundated frequently enough to warrant such designs throughout; they could be beneficial in the lower levels of the section that is frequently inundated. We also note that such designs will be increasingly useful as sea level rise progresses. Examples of possible designs are included in a Power Point the Port of San Francisco presented to the SF Bay Joint Venture Conservation Delivery Committee in August 2020 to support their request for the JVs support (saved in B. Organizations folder). The DEIR should discuss which of the various designs would be appropriate for the sea walls on Corte Madera Creek, i.e., which would provide substrate that supports species found in Corte Madera Creek. One or even more of these wall designs should be added to the project to provide habitat on the floodwall, unless there is strong reason that such designs would have adverse impacts. The design(s) that is or are most appropriate for supporting species native to Corte Madera Creek should be used.	• Chapter 5 Alternatives
		The DEIR should address the following: What is the purpose of the steps to the creek; are the steps intended to allow people to view the water, or go into or play in the water?	• Chapter 2 Project Description
		What are the potential impacts of the steps to fish and birds attempting to feed or rest in the creek? We are concerned that use of the steps would result in the creek waters in the vicinity being reduced in habitat value for wildlife, particularly	• Section 3.3 Biological Resources, Impact 3.3-2

Date	Commenter (Organization)	Comments	EIR Topic and Section
		birds. Usually more wildlife can be viewed from further away, i.e. from the trail on the top of the bank. Many studies have confirmed that wildlife leave when humans come close, and we would expect that would occur here.	
		Discuss the risk of folks getting hurt, drowning or being adversely affected by poor water quality, as a result of constructing steps to the creek. Discuss the legal risk to the county should someone get sick, be hurt or drown.	• Section 3.8 Hazards and Hazardous Materials, Impact 3.8-4
		Analyze an alternative that does not include the section of the project in Ross. We understand there is not clear support for the project from the Town of Ross. It is important to have an alternative that will allow a project to move forward without delay, even if the Ross Town Council does not support it. There also should not be delay due to inadequate environmental review. Therefore, the DEIR should address a reduced project alternative that does not include the sections in the Town of Ross that the Ross council does not support.	• Chapter 5 Alternatives
		Individuals	
August 18, 2020	Edi Alvarez	What noise, if any, may be associated with the ongoing operation of a pump station located at the foot of Laurel Avenue and adjacent to the creek?	• Section 3.10 Noise, Impact 3.10-1
August 27, 2020	Michael Wanger	Regarding the Granton Park Flood Wall, as indicated in Figure 01c, is the location of the upstream end of the wall accurate, or just an estimate?	• Chapter 2 Project Description • The locations of the floodwalls reflect current engineering and design
		Will the pedestrian path between (a) the Flood Control access at the end of Locust Avenue and (b) the Kentfield Hospital Bridge be preserved?	• Section 3.12 Recreation, Impact 3.12-1

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Regarding the Granton Park stormwater pump station, where will the water be pumped to?	• Chapter 2 Project Description
September 3, 2020	Jeff Abend	Bike path is a critical artery for many people in the area. How will the bike path be impacted? Will it be closed at all?	• Section 3.12 Recreation, Impact 3.12-1
September 9, 2020	Michael Wanger	Will the foot path on the south side of the creek, which currently runs downstream from the Stadium Way footbridge, connect to the downstream section of the path as it does now? This is a major access way.	• Section 3.12 Recreation, Impact 3.12-1
September 14, 2020	Charles Goodman	The County is using the Army Corps EIR/EIS Plan J Bypass as the basis for their own EIR/EIS. This is flawed because the County has left out all of the residents of Sylvan Lane and Shady Lane from hydraulics and hydrology.	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology and Impact 3.9-5
		They have failed to account for any overload water flows from Bolinas Avenue, Fernhill, Southwood, Norwood, Ames or Lagunitas Road.	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology
		The EIR/EIS must address the significant impact on reducing the flow through Fred Allen Park, from supercritical flow to a 10-25 year level of Flood Protection (per comment from Liz Lewis, at the July 9,2020 Ross Town Council Meeting). The number of 10-25 year is baseless and has not been verified by the County.	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology
		The County must address the removal of over 200 mature trees and how it plans to replace the Park Setting, Privacy, and Habitat Coverage in a timely manner.	• Section 3.1 Aesthetics and Visual Resources, Impact 3.1-2 • Section 3.3 Biological Resources, Impact 3.3-2 • The EIR evaluates direct, indirect, and cumulative physical effects of the project on the environment. Privacy is not an impact that is considered within the context of CEQA.

Date	Commenter (Organization)	Comments	EIR Topic and Section
		The County must address sediment removal. ("This study's uncalibrated sediment budget estimates that the Corte Madera Creek Watershed supplies about 7,250 tons of bedload each year to the reach above Ross. The calibrated Parker-Klingerman sediment transport model estimated average bedload sediment inflow at Ross is about 6,750 tons/year. Using an average of the two results, the study estimates that about 7,000 tons/year of bed load are delivered to Ross, or about 450 tons/sq. mi. /year.") Source: Geomorphic Assessment of the Corte Madera Creek Watershed, final report. To remove 7,000 sediment at 20 tons per truck= 350 trucks (loads). Load 6 trucks per hour, (1 every 10 minutes) equals 58 hours or over 7 works days for removal. How does the County plan to mitigate this substantial disruption of removing sediment from the Town?	• Section 3.9 Hydrology and Water Quality, Impact 3.9-2 • Impacts form upstream projects are addressed under cumulative impacts (Chapter 4 Growth-Inducing and Cumulative Effects). The project will not create conditions that would result in increased sediment load into the Town of Ross.
September 15, 2020	Leslie and J. Bradley O'Connell	Removal of the concrete channel in Ross, which has functioned well, will expose some homes on Sir Francis Drake to the prospect of greater flooding. Will the County or Town of Ross be responsible for these damages? There are safety risks presented by increased access via Frederick Allen Park to rushing water. The County's model as to the reduction in flooding does nothing to address the flooding caused by overland or runoff water. It is acknowledged as a problem in the previous EIR draft, but no specific approaches were suggested. The FAP flood wall design has not taken into account the possible introduction of increased flooding caused by overland water or creek overflow water trapped behind the walls. Project would introduce the possibility of greater harm during floods, greater harm to fish and trees, and greater risk throughout the year for families and homes becoming more vulnerable to flooding.	• Section 3.9 Hydrology and Water Quality, Impact 3.9-5

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Project will strip out mature trees providing shade and moisture for greater ecosystem.	• Section 3.3 Biological Resources, Impact 3.3-2 and Section 3.1 Aesthetics, Impact 3.1-5.
		The removal of the foliage between the creek and the homes on Sir Francis Drake will result in a grievous diminution of privacy.	• The EIR evaluates direct, indirect, and cumulative physical effects of the project on the environment. Privacy is not an impact that is considered within the context of CEQA.
September 18, 2020	Garril Page	Areas of controversy that remained in this EIR from 2018 EIR/EIS: 1.Community perception of floodwalls on private property; 3.Potential vegetation removals for for floodwalls per USACE guidelines; 5.Increased flood risk downstream of project sites; 6.Adequate passage and habitat for enhances fish species. Additional unresolved issues: Refinements to TSP; Floodwall heights of the TSP; Vegetation Variance along Floodwalls. Questioning the new project objectives. Where is information on the proposed Access Ramp. Extensive additional comments organized by resource topic (see pdf file). Strongly opposes FAP component.	• Comment noted • Response or response location in the EIR for each comment is provided below.
		Added to the above list should be the selection of Public Access and Recreational Quality as one of the six Project Objectives. What is the justification for this addition except to capture the DWR grant to finance downstream project elements? It is an objective that appears not widely shared, an area of controversy.	• Section 2.4 Project Objectives. The evaluation of project objectives in consideration of alternatives is addressed Section 5 Alternatives.
		What opportunity has the public to comment on the need for the project to be Fiscally Responsible per the list of six Project Objectives? If an EIR will not include consideration of fiscal issues, then fiscal responsibility is not relevant to solicitation of public commentary for that EIR. Why was this irrelevant Fiscally Responsible project objective made part of the August 27, 2020 scoping session and repeated in the Project Information Sheet on the County's website?	• Economic viability of a project or alternative is a consideration under CEQA Guidelines Section 15364. The purpose of this objective is to focus the project in a manner that will allow the project to be implemented.

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Refinements to TSP…: relocation of sanitary sewer line which intersects with the fish ladder and Allen Park Riparian Corridor … pump stations are not in the cost estimate and the project team has not performed an interior drainage analyses to determine if there is need.	• Chapter 2 Project Description. It was determined that relocation of the sanitary sewer line is not necessary. • Section 3.9 Hydrology and Water Quality, Impact 3.9-5
		Floodwall Heights of the TSP: USACE has not completed a Risk and Uncertainty Analysis to determine exact heights of floodwalls… some vegetation removal within the creek channel may be needed within Unit 4…;	• Chapter 2 Project Description. Floodwall heights and the vegetation removal within Unit 4 is described in the Project Description and analyzed in the EIR.
		Vegetation Variance along Floodwalls: … assuming a 15-foot buffer… A risk analysis will be performed for Corte Madera Creek…This will determine to what extent riparian vegetation could be restored at Frederick Allen Park Riparian Corridor within 15 feet of floodwalls.	• Chapter 2 Project Description. We have presented an upper and lower range of tree removal and vegetation planting to reflect the range of USACE requirements. USACE could also currently enforce a 15-foot setback for tree removal from the existing concrete wall based on its guidance.
		The Access Ramp in the vicinity of the Kentfield Pump Station was indicated in the icons, but not depicted in Figure 01c [Minute 6:44] in the Presentation nor included in Project Elements discussion. Where is information on the proposed Access Ramp? Has the ramp been deleted from consideration?	• A new permanent access ramp to the Corte Madera Creek flood control channel is planned for completion in 2021 as a separate to provide access for District maintenance of the flood control channel. The access ramp is discussed as a cumulative project and is discussed in more detail in Chapter 4.0 Growth-Inducing and Cumulative Effects.
		Ross' essence and character are defined by the high canopy of its majestic heritage trees. The proposed Frederick Allen Park (FAP) Riparian Corridor as proposed is barren, stark, denuded of natural beauty, and very inhospitable. The proposed man-made shade structures are not in keeping with any aspect of the town, and appear to be poor substitutes for the trees that would be removed. The shade structures	• Section 3.1 Aesthetics and Visual Resources, Impact 3.1-2 and Impact 3.1-5

Date	Commenter (Organization)	Comments	EIR Topic and Section
		provide relatively little shade for humans, none for fish in the basin, and are not appropriate, welcoming, nor attractive to gaze upon.	
		Tree loss creates emphasizes the proximity of Sir Francis Drakes traffic. This becomes visual pollution for Ross Common. The intrusion will be particularly notable within the proposed FAP Riparian Corridor.	• Section 3.1 Aesthetics and Visual Resources, Impact 3.1-2
		Alternative suggested: Removal of Fish Ladder Only. Preserve the mature alders lining the creekbed.	• Chapter 5 Alternatives
		Ross is distinguished by its trees: the high canopy overlays the town, creating a unique character immediately evident on entering Ross' shaded streets. FAP is Ross' urban forest, adjacent to a major arterial, yet a peaceful and relatively serene oasis on even the hottest days.	• Section 3.3 Biological Resources, Impact 3.3-5
		All along the creeks and roads, Ross' trees reduce pollution, store carbon, help control storm water, reduce noise and raise property values. Trees promote biodiversity: plants, birds, insects, small animals and microscopic soil dwellers thrive under the tree canopy. Root systems of mature alders and willows in creek bank toes and along walls create stability. The native oaks and redwoods resist wildfire and provide shade and cool water for creeks. These attributes exist; they must be valued proportionately and weighed against the odds of an improbable return of endangered, extirpated coho, the small number of observed migratory salmon and trout, the ecological disturbances resulting from the FAP proposal's expanded development and habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition and lessened quality of life for residents.	• Section 3.3 Biological Resources, Impact 3.3-2 • Section 3.7 Greenhouse Gases, Impact 3.7-1

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Ross public life centers around the Post Office, The Common, Ross School, and the commercial area. If the FAP Riparian Corridor Project creates pools of still water, bats and other insect-eaters become an even more important resource. Residences along Ross' creeks benefit from bats and insect predators. The proposed extent and duration of the FAP Riparian Corridor project will result in disturbance of roosts and habitat, and adversely affect enjoyment of exterior areas throughout Ross. Wildlife displaced by the project may never return to the denuded habitat.	• Section 3.3 Biological Resources, Impact 3.3-2
		I combine these two headings as I have commented extensively on these subjects in prior EIR, and EIR/EIS opportunities. Having been told the USACE and County have collected such materials for inclusion in the current EIR, I herewith incorporate those Comments by reference. If, in fact, the current consultants have found and read my prior Comments, they have been advised regarding historical, cultural and tribal resources in Ross from 1960-2018. I assume the Town of Ross has mentioned relevant reports and resources for which Ross has contracted separately.	• Section 3.4.5 Cultural Resources • Section 3.14.3 Tribal Cultural Resources
		I will add that the FAP Riparian Corridor proposes excavation and land disturbance in areas of early tribal settlements. The Project lead agency must exercise extreme diligence in honoring artifacts uncovered in the project area.	• Section 3.4 Cultural Resources, Impact 3.4-2 • Section 3.14.4 Tribal Cultural Resources
		The proposed FAP Riparian Corridor lies within a watershed remarkable for the quantity of sediment shed into its waterways. Prior projects repeatedly miscalculated the effects of erosion and aggregation, and failed to comprehend the effects of these elements. Dysfunction results. This is history best NOT repeated.	• Section 3.9 Hydrology and Water Quality

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Marin's Countywide Plan is a resource: maps and geological reports as well as data collected during annual creek maintenance and dredging should be part of this EIR.	• Section 3.6.3 Geology and Soils
		Floodwalls, retaining walls and grade control structures create potential entrapment for those behind proposed new and modified walls. If flows outflank these structures, hazardous conditions result. The selected project should correct, not create, risk.	• Section 3.9 Hydrology and Water Quality
		The proposed side path, and steps to the creek invite access by the public. This creates dangerous conditions for unsuspecting people unaware that flows in the project area are forceful enough to transport an 18-inch boulder past the College of Marin into the downstream, natural channel. The unwary are not afraid of the creek: a Kentfield resident drowned in the channel. During flood conditions, small watercraft and surfboards are in use along Berens Drive and at the Bon Air Center.	• Section 3.8 Hazards and Hazardous Materials, Impact 3.8-4
		Enhancing fish habitat should not invite incompatible human recreational activities.	• Biological Resources, Impact 3.3-2. Chapter 5 Alternatives
		A realigned multi-use pathway encourages speeding bikes that endanger pedestrians, small children and pets enjoying walks along the path.	• Section 3.13 Transportation and Circulation, Impact 3.13-1
		Excessive tree removal proposed for FAP Riparian Corridor creates ecological disturbances, expanded development, habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition where planned riparian growth may be more susceptible to wildfire.	• Section 3.3 Biological Resources, Impact 3.3-2

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Adding 11 -17 new larger fish resting pools to the channel bottom has unknown effect on the existing concrete structure's stability and safety.	• Section 3.6 Geology and Soils, Impact 3.6-3
		The Oct 2018 EIR/IS predicted increased flooding downstream of Ross and specifically in the College of Marin area. By removing the channel walls in the lower Unit 2 channel, approximately the areas extending from Stations 332+00 to 320+00, increases the potential for toxic waste entering the natural creek habitat. The College of Marin's dumping facility, a.k.a. trash transfer station, has been a source of protest and concern. The facility is wrapped within the channel's curve. Lowering walls, and widening banks destabilizes existing conditions and increases potential encroachment of flood waters into this COM facility.	• Section 3.9 Hydrology and Water Quality, Impacts 3.9-1, 3.9-3, and 3.9-5
		The cumulative effect of removing San Anselmo's Azalea, Madrone, Nokomis, Center/ Sycamore and Ross' Winship bridges, plus removal of the fish ladder constraint, is to increase downstream flood flows. This increases potential flooding at the trash transfer station, spilling toxic waste into the surrounding habitat.	• Chapter 2 Project Description • Section 3.9 Hydrology and Water Quality, Impact 3.9-5
		The EIR/EIS states Alt J induces more frequent flooding at the College of Marin per Appendix A sections 7.1,7.5.6, 8.2, 9.1 and in Areas of Controversy #5 above.	• Section 3.9 Hydrology and Water Quality, Impact 3.9-5
		The proposed sediment basin for FAP is needlessly disruptive, depends on massive excavation for function. The concept: dig the biggest possible hole, fill with water.	• Chapter 5 Alternatives
		The proposed FAP Riparian Corridor lies within a watershed unique due to the quantity of sediment shed into its waterways. Prior projects repeatedly have miscalculated the effects of erosion and aggregation, and also have used	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology

Date	Commenter (Organization)	Comments	EIR Topic and Section
		incorrect, challenged Mannings 'n' values with resultant flawed concepts, dysfunction, and failed performance.	
		Concepts rendered infeasible due the channel's existing slope constraints, sinuosity, lack of freeboard, steepness and elevation restrictions now further complicated by rising tidal influence, must be part of this EIR.	• Chapter 5 Alternatives
		Partial consideration wherein only certain aspects and areas of the channel are included in studies and reports ensures continued failure: Winship Bridge to Lagunitas Bridge must be included the proposed project.	• Chapter 5 Alternatives • Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology
		Replacing the V-shaped bottom that directs sediment to the channel's center seems a better alternative than a flat-bottomed, slow-flowing basin that traps sediment. The hope that cobbles and fine sediment can form a more natural creek bottom for fish is unrealistic in a channel grossly affected by sediment dynamics, where flood events historically are varied and diverse. I think it is far more likely that the planned low-'n' value plants will be swept away, creating greater maintenance and expense for both Ross and the downstream areas receiving the detritus. Unstable, choked, silted areas do not provide good fish habitat. A v-shaped channel has the potential for chutes, falls, pools and plunges with quieter flows along the channel slides. This appears to be an appropriate concept that enables both fish passage and flood protection.	• Chapter 2 Project Description • Chapter 5 Alternatives
		Adding 11 -17 new larger fish resting pools to the channel bottom has unknown effect on flow, sediment transport and sedimentation. Since formulas used to model proposals are limited by data uncertainty, odds of selecting correct assumption(s) essential to determining the appropriate	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology and Impacts 3.9-5

Date	Commenter (Organization)	Comments	EIR Topic and Section
		computer programming lessen exponentially with additional unquantified designs.	
		The new larger fish resting pools in the channel bottom creates unknown effect on the existing concrete structure's stability, coefficient of roughness, profile at the time of any given flood event. Therefore, reliable, accurate predictions of potential turbulence and other hydraulic effects become less likely.	• Section 3.6 Geology and Soils, Impact 3.6-3 • Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology and Impacts 3.9-5 6
		The EIR/EIS states Alt J induces more frequent flooding downstream of Ross at, for example, the College of Marin per Appendix A sections 7.1,7.5.6, 8.2, 9.1 and in Areas of Controversy #5 above. Induced flooding is a significant adverse consequence, an added risk, and must be identified as such.	• Section 3.9 Hydrology and Water Quality, Impact 3.9-5
		The design for the Access Ramp is listed as complete, but plans for the proposed structure are hard to find. What will be done to ensure the Access Ramp does not allow water to escape from the channel back into Granton Park? What prevents flows trapped by the ramp from increasing Granton Park flooding?	• Chapter 4.0 Growth-Inducing and Cumulative Effects, Section 4.3 Cumulative Impacts.
		Suggested Alternative: Fish ladder removal only. More transparency and response to public concerns over function; answers to questions and concerns raised over hydrology and hydraulics, performance of concepts. The process to date has not inspired confidence.	• Chapter 5 Alternatives
		No one in Ross welcomes the noise of Sir Francis Drake Blvd. The FAP Riparian Corridor results in permanent, increased noise intrusion from SFD throughout a large portion of Ross. The longer construction period of FAP Riparian	• Section 3.10 Noise, Impact 3.10-1

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Corridor means extended, expanded exposure to all aspects of construction noise.	
		No one in Ross welcomes the toxic traffic fumes of Sir Francis Drake Blvd. The FAP Riparian Corridor results in increased air pollution from SFD and diminished air quality for at least 10 years, probably longer, until proposed trees mature. Deciduous trees will be less effective in removing toxic fumes. and improving air quality. The longer construction period of FAP Riparian Corridor means extended, expanded exposure to all aspects of construction-caused air pollution.	• Section 3.2 Air Quality, Impact 3.2-3
		Biking has become more and more popular form of recreation and for some people, of transportation. Unfortunately, the increase in popularity has meant increases in heedless behavior, traffic violations and increased speed that endangers pedestrians. Upgrading the multi-use path encourages greater use and abuse, requires more regulation, increased supervision, and added demands on Town staff and services as well as less privacy for town residents. The lengthy period of construction for the FAP Riparian corridor increases traffic disruption and inconvenience for Ross residents and drivers on SFD. The proposed FAP Riparian Corridor is maximum disruption for minimal gain.	• Section 3.11 Recreation, Impact 3.12-3. • Section 3.13 Transportation and Circulation, Impact 3.13-3.
		The county cannot capture DWR funds if Ross refuses design approval or balks at granting the easement. The Ross Council repeatedly has requested a more moderate alternative and increased information. It is time to honor their requests.	• This is an inaccurate statement. The Town of Ross does not have jurisdiction over elements of the project outside of the Town of Ross. The Town of Ross is not a party to the DWR grant with the District. The EIR has been prepared to address comments provided by the Town. • Chapter 5 Alternatives
		After 48 years, and approximately the same amount in millions of dollars wasted, accountability is due. It is time to provide	• This comment addresses the merits or content of the project and not the scope of the EIR.

Date	Commenter (Organization)	Comments	EIR Topic and Section
		an honest assessment of project performance for Units 4,3,2,1. People who pay taxes and flood fees are weary of force-fed, piecemeal projects and undeveloped, ill-defined concepts.	• This EIR has been prepared consistent with the requirements of CEQA and incldues a detailed evaluation of the physical impacts of the project.
September 18, 2020	Samantha Hobart	Advise each property owner where the flood elevations are before and after any creek work is completed. Be able to discuss changes to individual's properties and not only a select few property owners like with the San Anselmo Flood Risk Reduction Project. Provide a Fish Ladder removal-only alternative. The root systems of the mature trees in Frederick Allen Park are an integral part of flood prevention and protection; removing these trees and their root sytems will cause significant damage and increased risk to flooding and the erosion.	• Section 3.9 Hydrology and Water Quality, Impacts 3.9-2 and 3.9-5 • Chapter 5 Alternatives
September 20, 2020	Doung Ryan	If any mitigation is required, will it be done at the County's expense, or will the County introduce the novel concept of "proportionality" to try to offload the cost of preventing flooding on a homeowner's house to the homeowner, even though it is actions taken by the County that would be causing the flooding? What does the model being used show as the water level and flood levels before the san anselmo creek project and after? Does the impact of the Winship Bridge replacement have a similar effect on the houses downstream in the scope of this project and how is this accounted for? Why is so-called beautification being included as part of a flood control project? Resources are scarce and should be focused on flood control and nothing else. What does the beautification project do to reduce flooding?	• Section 3.9 Hydrology and Water Quality, Impact 3.9-5
		One of the alternatives that should be considered is removal of the fish ladder and nothing else. How much would that cost? This has been requested several times and the County has deliberately chosen to ignore this alternative. What is the benefit to cutting down 200 mature trees?	• Chapter 5 Alternatives • Section 3.3 Biological Resources, Impact 3.3-2

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Scoping Meeting	
August 27, 2020	Barbara Salzman	Will this presentation be available on the project website?	• The Scoping Meeting presentation is available on the project website at https://www.marinwatersheds.org/resources/projects/corte-madera-creek-flood-risk-management-project.
		This is a great project, and I think getting rid of the concrete wall would be an incredible benefit. Surprised about steps down to the creek. Do not like the idea of creek access. Not clear where that will be. Increases county liability and it isn't good for the resources.	• Chapter 2 Project Description • Section 3.8 Hazards and Hazardous Materials, Impact 3.8-4 • This EIR evaluates direct, indirect, and cumulative physical effects of the project on the environment. Legal liability related to creek access is not an impact that is considered within the context of CEQA.
		Typical scoping process, everyone's comments will be addressed in the EIR. Does not like that you can't see what comments people have typed in the zoom platform.	• All written and oral comments submitted during the scoping meeting have been included in this report.
	Charlie	Want to look at just removal of fish ladder alternative.	• Chapter 5 Alternatives
		County has made this a piecemeal project from Fairfax, San Anselmo, Ross, and Kentfield.	• Section 4.3 Cumulative Impacts
		Concerned about area between Sir Francis Drake and Lagunitas Bridge – left out of project	• Chapter 5 Alternatives
		Don't agree with the calculations of volume coming out of the creek – new Lagunitas Bridge will not handle that water. Water comes out at Lagunitas and Sylvan Lane and will flood all houses on Poplar. Homes not protected by project. Continually will not address the interior drainage that has no way of getting back into the concrete channel.	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology and Impact 3.9-5

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Talk about sediment dynamics, want an explanation of what sediment dynamics consists of.	• Section 3.9 Hydrology and Water Quality, Section 3.9.3 Erosion and Sedimentation
		Is there a way to find out how many people are attending?	• Thirty-seven people attended the web-based scoping meeting on August 27, 2020. • Refer to Attachment A for the meeting attendee report.
	Elizabeth Robins	Wonder why you haven't looked into the possibility of just removal of the fish ladder. Several Council members requested that EIR look at that option. Removing the flood ladder would be relatively inexpensive, the whole project is very expensive.	• Chapter 5 Alternatives
		Safety is a big problem with this project. Don't want people going into the creek during a storm. Dangerous creek when there is a lot of rain. Concerned about steps down to creek and not fencing off water. Puts people up close to rapidly flowing water.	• Chapter 2 Project Description • Section 3.8 Hazards and Hazardous Materials, Impact 3.8-4
		Where does the Town of Ross come in? How can they discuss it? Didn't see any listing for presenting the project to Town of Ross and Town Council.	• Chapter 1 Introduction
	Garril Page	Concerned about hydraulics and design of the project. When you have larger fish resting pools, it changes the way the water and the sediment moves in the channel.	• Section 3.9 Hydrology and Water Quality, Impact 3.9-5
		Where there are new flood walls, potential to trap people behind those walls with flood waters. Liability potentially increased by people being close to the creek.	• Section 3.8 Hazards and Hazardous Materials, Impact 3.8-4
		In the watershed there is local drainage and a large source of flooding in Ross. Not considering the watershed, because not considering any local drainage.	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Would like to see some specifics, what is the regrading of the fish ladder? How much regrading? Regrading affects the function, the function affects the hydraulics and the hydraulics affects the results.	• Chapter 2 Project Description • Section 3.9 Hydrology and Water Quality, Impacts 3.9-2 and 3.9-5
	Jenny Mota	Residents who live along this track please stay informed and to make sure if plans or aspects of the project change that they are well aware. I have been told mitigation would be provided and now being told my home will receive no mitigation even though water levels will be increasing at my residence because of the San Anselmo Flood Risk Reduction Project.	• Comment refers to a different project and different EIR. Not relevant to CEQA analysis for the proposed project.
		Modeling seems to be inaccurate and/or changing and people need to be aware there could be changes that may impact them negatively.	• Comment refers to a different project and different EIR. Hydrologic modeling for the Corte Madera Creek Flood Risk Management Project is provided in Section 3.9.5 Impact Assessment Methodology
		If a mitigation measures is changed after the Draft and Final EIR are finalized and accepted could you explain why this would happen or why this is ok?	• Mitigation measures included in the EIR will be incorporated into the mitigation monitoring and reporting program (MMRP). The mitigation measures in the MMRP will be adopted as part of project approval and will be implemented by the District. (CEQA Guidelines Sections 15091 and 15097)
	John Crane	What percentage of the budget is allocated for Frederick Allen Park vs. flood prevention?	• The EIR evaluates direct, indirect, and cumulative physical effects of the project on the environment. Budget allocation is not an impact that is considered within the context of CEQA.
		Is there a way to respond to comments? Very off putting, feels deliberate.	• The purpose of the scoping meeting is to solicit agency and public input on the scope of environmental issues that should be addressed in the EIR. All scoping comments are included

Date	Commenter (Organization)	Comments	EIR Topic and Section
			and addressed in this Scoping Report and in the EIR to the extent the comment is relevant to CEQA. There will be another opportunity to provide input during the 45-day public review period for the Draft EIR.
		Who are you, and how are you being compensated?	• The public scoping meeting held on August 27, 2020 at 6:00 p.m. was led by Liz Lewis, Marin Flood Control and Water Conservation District and Susanne Heim, Panorama Environmental, Inc. • The EIR evaluates direct, indirect, and cumulative physical effects of the project on the environment. Compensation is not an impact that is considered within the context if CEQA.
	Julie McMillan	Would like to look into the alternative of removing just the fish ladder.	• Chapter 5 Alternatives
		If Frederick Allen Park is used as a flood plain, many trees will be removed, will be bad aesthetically and expensive to add replacement trees	• Section 3.1 Aesthetics and Visual Resources, Impact 3.1-2
	Leslie	No mention of the over ground water and how that will be dealt with. The whole modeling has been so inconsistent as seen with the San Anselmo area, could be inaccurate. If you cause more flooding, who will be responsible?	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology
		What is meant by "reduced footprint in Frederick Allen Park"?	• Chapter 5 Alternatives
		Why did the Army Corps of Engineers pull out of the project last time, and why are they not interested in participating this time?	• Chapter 1 Introduction
		During the last project proposal, even if the plan was approved, the town would still have the ability to say no. At	• The Town of Ross owns Frederick Allen Park and has discretionary authority to approve or

Date	Commenter (Organization)	Comments	EIR Topic and Section
		what point during this process does the town loose the power to say no?	deny work within the park. The Town will have the ability to decide on whether to approve of the work within the park after the EIR has been adopted by Marin County Board of Supervisors.
	Marta Osterloh	What are the plans for recreation opportunity?	• Section 3.12 Recreation, Impact 3.12-3
	Nicholas Salcedo	One of the project objectives should be to remove as much concrete as possible, raising of the concrete wall seems to be in conflict with that. Would like to see an alternative that uses as much natural material, boulders and woody debris, as possible. Would like to see an alt. that would minimize the need and height of the walls. Locate on outside edge of easement and construct of wood to minimize need for additional concrete.	• Chapter 5 Alternatives
	Pam	Will cement between College of Marin and Ross be dismembered? Will there be a natural channel to cement then natural channel?	• Chapter 2 Project Description
		Hopes that the project will not remove fences at the back of the property in cement area so that people do not get pulled in during a flood. If someone falls in they will be dead – too fast moving and rapid water.	• Section 3.8 Hazards and Hazardous Materials, Impact 3.8-4
		Look into option of putting in a pump. Last flood – College Court really affected. Homeowner would do something prior to flooding to get prepared. Doesn't know if this is what the pumping station will be. College Court has some sort of a device and gets drastically hit.	• Chapter 2 Project Description
		Ross has sewer system in the streets. Stops at Ross border. Good to have some sort of drainage under Kent Avenue to flow water out. Drain that opens up. If redoing plumbing on Kent Avenue, include that.	• This project does not involve plumbing work on Kent Avenue. All project features are described in Chapter 2 Project Description.

Date	Commenter (Organization)	Comments	EIR Topic and Section
		Very happy that everyone is attending, are these comments going to be in the EIR report?	• All scoping comments are included in this Scoping Report.
	Peter Hogg	Is there a risk of losing grant funds if you do not proceed with this project?	• DWR grant funding (approximately $7 million) is only available if construction is completed before the end of 2022.
	Richard Gumbiner	Will public be notified prior to completion of the EIR of the proposed trees slated for removal in each segment of the project, and will replacement trees be identified at that point?	• The Draft EIR will be available for the public to review and comment when it is complete. Information regarding tree removal and replacement is provided in Section 3.3 Biological Resources described in Chapter 2 Project Description and Appendix B.
	Samantha Hobart	Guidelines of first finished floor as a mitigation measure for hydrology. Require a 1-foot margin of floor if District wishes to use first finished floor as a measure. Requests measure reflects first finished floor less 1-foot to protect the residents.	• Section 3.9 Hydrology and Water Quality, Section 3.9.5 Impact Assessment Methodology and Impact 3.9-5
		Concerns if EIR will be abided by and concerned mitigation measures will be changed after the fact. Residents noticed as part of EIR continue to receive mitigation measures and measures are not changed after the EIR.	• Mitigation measures included in the EIR will be incorporated into the mitigation monitoring and reporting program (MMRP). The mitigation measures in the MMRP will be adopted as part of project approval and will be implemented by the District. (CEQA Guidelines Sections 15091 and 15097)

Comment Letters Received

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State of California – Natural Resources Agency
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

September 21, 2020

Ms. Joanna Dixon, Associate Civil Engineer
Marin County
3501 Civic Center Drive, Suite 304
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cortemaderacreek@marincounty.org

Subject: Corte Madera Creek Flood Risk Management Project, Phase 1, Notice of Preparation of a Draft Environmental Impact Report, SCH No. 2020080353, Marin County

Dear Ms. Dixon:

The California Department of Fish and Wildlife (CDFW) has reviewed the Notice of Preparation (NOP) of a draft Environmental Impact Report (EIR) provided for the Corte Madera Creek Flood Risk Management Project, Phase 1 (Project) located in Ross and Kentfield, Marin County. CDFW previously submitted comments in response to the former NOP and Draft Environmental Impact Statement/Environmental Impact Report (SCH No. 2008072036) for the Project.

CDFW is a Trustee Agency with responsibility under the California Environmental Quality Act (CEQA) §15386 for commenting on projects that could impact fish, plant, and wildlife resources. CDFW is also considered a Responsible Agency if a project would require discretionary approval, such as a California Endangered Species Act (CESA) Incidental Take Permit, a Lake and Streambed Alteration (LSA) Agreement, or other provisions of the Fish and Game Code that afford protection to the state's fish and wildlife trust resources. Pursuant to our jurisdiction, CDFW has the following concerns, comments, and recommendations regarding the Project.

PROJECT DESCRIPTION AND LOCATION

Proponent: Marin County Flood Control and Water Conservation District

Objective: The objective of the Project is to reduce the risk of flooding in the communities of Ross and Kentfield. Primary Project activities include removing the wooden Denil fish ladder in Ross; excavating portions of Corte Madera Creek to lower channel elevation and increase flow capacity; removing concrete channel and constructing a natural floodplain in Frederick Allen Park; replacing floodwalls along portions of Corte Madera Creek; installing a stormwater pump station to control flooding in the Granton Park neighborhood; creating larger fish resting pools in reaches of concrete channel; and removing the concrete channel downstream of Stadium Way to improve fish and wildlife habitat.

Conserving California's Wildlife Since 1870

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Location: The Project is located in the Town of Ross and the unincorporated Community of Kentfield in Marin County. The Project's upstream extent within Corte Madera Creek is at Lagunitas Road in the Town of Ross and the Project terminates at the earthen channel in Kentfield, downstream of Stadium Way. The approximate Project centroid occurs at Latitude 37.95669°, Longitude -122.54892°.

Timeframe: Project construction is proposed for 2022 beginning in spring and finalizing in fall.

The CEQA Guidelines (§§15124 and 15378) require that the draft EIR incorporates a full project description, including reasonably foreseeable future phases of the Project, and that it contains sufficient information to evaluate and review the Project's environmental impact. Please include a complete description of the following Project components in the Project description:

- Footprints of permanent Project features and temporarily impacted areas, such as staging areas and access routes
- Encroachments into riparian habitats, wetlands, or other sensitive areas
- Area and plans for the proposed floodwalls, ground disturbing activities, channel fill removal, fencing, paving, stationary machinery, landscaping, stormwater systems, and any other construction activities
- Operational features of the Project, including level of anticipated human presence (describe seasonal or daily peaks in activity, if relevant), artificial lighting/light reflection, noise and greenhouse gas generation, traffic generation, and other features
- Construction schedule, activities, equipment, and crew sizes
- Dewatering and species relocation plan, including species likely to be encountered

ENVIRONMENTAL SETTING

Sufficient information regarding the environmental setting is necessary to understand the Project's, and its alternative's (if applicable), significant impacts on the environment (CEQA Guidelines, §§15125 and 15360). CDFW recommends that the CEQA document prepared for the Project provide baseline habitat assessments for special-status plant, fish, and wildlife species located and potentially located within the Project area and surrounding lands, including all rare, threatened, or endangered species (CEQA Guidelines, §15380). Fully protected, threatened or endangered, candidate, and other special-status species that are known to occur, or have the potential to occur in or near the Project site, include, but are not limited to:

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- Coho salmon south of Punta Gorda (*Oncorhynchus kisutch*), state and federally listed as endangered
- California Ridgway's rail (*Rallus obsoletus obsoletus*), state and federally listed as endangered, and a Fully Protected Species
- Salt-marsh harvest mouse (*Reithrodontomys raviventris*), state and federally listed as endangered, and a Fully Protected Species
- California black rail (*Laterallus jamaicensis coturniculus*), state listed as threatened and a Fully Protected Species
- Central California Coast Distinct Population Segment steelhead (*Oncorhynchus mykiss irideus pop. 8*), federally listed as threatened
- California red-legged frog (*Rana draytonii*), federally listed as threatened and a California Species of Special Concern (SSC)
- Foothill yellow-legged frog (*Rana boylii*), SSC
- Western pond turtle (*Emys marmorata*), SSC
- Pallid bat (*Antrozous pallidus*), SSC
- White-tailed kite (*Elanus leucurus*), Fully Protected Species
- Napa false indigo (*Amorpha californica* var. *napensis*), California Rare Plant Rank 1B

Habitat descriptions and species profiles should include information from multiple sources, including: aerial imagery, historical and recent survey data, field reconnaissance, scientific literature and reports, and findings from positive occurrence databases such as the California Natural Diversity Database (CNDDB). Based on the data and information from the habitat assessment, the CEQA document can then adequately assess which special-status species are likely to occur in the Project vicinity.

CDFW recommends that prior to Project implementation, surveys be conducted for special-status species with potential to occur, following recommended survey protocols if available. Survey and monitoring protocols and guidelines are available at: https://www.wildlife.ca.gov/Conservation/Survey-Protocol.

Botanical surveys for special-status plant species, including those with a California Rare Plant Rank (http://www.cnps.org/cnps/rareplants/inventory/), must be conducted during the blooming period for all sensitive plant species potentially occurring within the Project area and require the identification of reference populations. Please refer to CDFW protocols for surveying and evaluating impacts to rare plants available at: https://www.wildlife.ca.gov/Conservation/Plants.

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The Project takes place along an urbanized corridor of Corte Madera Creek with residential, business, and community structures developed near the creek. The upstream segments of the Project provide freshwater habitat and a riparian corridor composed mostly of hardwood trees (CDFW 2009). The farthest downstream segment of the Project is tidally influenced and transitions to tidal wetland with fewer riparian trees. Corte Madera Creek is designated critical habitat for the state and federally listed as endangered Coho salmon South of Punta Gorda and the federally listed as threatened Central California Coast Distinct Population Segment steelhead. Corte Madera Creek is also designated essential fish habitat for various life stages of salmon. Steelhead are present in the creek and Coho have historically utilized the watershed.

The quality of Corte Madera Creek as a migration corridor for steelhead and Coho was degraded by the construction of the concrete flood control channel and the installation of the Denil fish ladder, a partial barrier to passage. The upstream portion of the concrete channel, identified as Unit 3, contains 28 evenly spaced concrete pools intended to function as resting pools for migrating salmonids installed when the concrete flood channel was constructed by the Army Corps of Engineers. However, most of the pools fail to reduce flow velocity and provide inadequate cover. Only a few of the existing pools provide suitable resting habitat, and migration is extremely challenging to steelhead currently utilizing the channel. The construction of the flood control channel was likely a contributing factor to Coho salmon's extirpation (Love et al. 2007).

Based on reviewing the Phase 1 Project Information Sheet, CDFW looks forward to reviewing the resting pool proposals throughout Unit 3 of the Project. CDFW recommends that improvement of fisheries habitat and fish passage be included as part of the planning objectives for developing and analyzing alternatives. CDFW recommends including an alternative that includes an improvement for all 28 resting pools to address fish passage in Unit 3.

Specifically, CDFW recommends that the draft EIR incorporate recommendations proposed in the Corte Madera Creek Flood Control Channel Fish Passage Assessment and Alternatives Analysis (Love, 2007). Remediation of the fish passage impediments in Unit 3 by incorporating treatments into the concrete channel, such as those presented in Love (2007), would provide suitable upstream fish passage under the range of anticipated tidal and streamflow conditions through all of Unit 3. The Love report states that the preferred alternative design for resting pools would improve fish passage from 2% to 78% for low flows, and from 1% to 65% for high flows, vastly improving the ability for fish passage during high and low flows.

Incorporating the 2007 Love report offers the opportunity for both remediation of impacts to steelhead and Coho, while also providing flood risk management to protect life and property.

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IMPACT ANALYSIS AND MITIGATION MEASURES

The CEQA Guidelines (§15126.2) necessitate that the draft EIR discuss all direct and indirect impacts (temporary and permanent) that may occur with implementation of the Project. This includes evaluating and describing impacts such as:

- Potential for "take" of special-status species
- Loss or modification of breeding, nesting, dispersal and foraging habitat, including vegetation removal, alteration of soils and hydrology, and removal of habitat structural features (e.g. snags, roosts, overhanging banks)
- Permanent and temporary habitat disturbances associated with ground disturbance, noise, lighting, reflection, air pollution, traffic or human presence
- Obstruction of movement corridors, fish passage, or access to water sources and other core habitat features

The CEQA document should also identify reasonably foreseeable future projects in the Project vicinity, disclose any cumulative impacts associated with these projects, determine the significance of each cumulative impact, and assess the significance of the Project's contribution to the impact (CEQA Guidelines, §15355). Although a project's impacts may be insignificant individually, its contributions to a cumulative impact may be considerable; a contribution to a significant cumulative impact – e.g., reduction of available habitat for a listed species – should be considered cumulatively considerable without mitigation to minimize or avoid the impact.

Based on the comprehensive analysis of the direct, indirect, and cumulative impacts of the Project, the CEQA Guidelines (§§ 15021, 15063, 15071, 15126.2, 15126.4 and 15370) direct the lead agency to consider and describe all feasible mitigation measures to avoid potentially significant impacts in the draft EIR, and/or mitigate significant impacts of the Project on the environment. This includes a discussion of take avoidance and minimization measures for special-status species, which are recommended to be developed in early consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and CDFW. These measures can then be incorporated as enforceable Project conditions to reduce potential impacts to biological resources to less-than-significant levels. Fully protected species such as California Ridgway's rail, California black rail, and salt marsh harvest mouse, may not be taken or possessed at any time (Fish and Game Code § 3511). Therefore, the draft EIR is advised to include measures to ensure complete take avoidance of these fully protected species.

CDFW is available to provide biological Mitigation Measures for fully protected species and other special-status species, including California Ridgeway's rail, California black

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rail, salt marsh harvest mouse, California red-legged frog and foothill yellow-legged frog, western pond turtle, bats, special-status plants, and nesting birds to name a few.

Based on our virtual meeting on September 17, 2020, CDFW is pleased that you will be incorporating the tree replacement ratios provided by CDFW:

Oak trees:

- 4:1 replacement for trees 5 to 10 inches diameter at breast height (DBH)
- 5:1 replacement for trees greater than 10 inches to 15 inches DBH
- 15:1 replacement for trees greater than 15 inches DBH, which are considered old-growth oaks

Replacement oaks will come from nursery stock grown from locally sourced acorns, or from acorns gathered locally, preferably from the same watershed in which they are planted.

Other tree species greater than or equal to 6 inches DBH will be mitigated at the following ratios:

- 1:1 replacement for non-native trees
- 3:1 replacement for native trees

Riparian Habitat Impact Analysis

CDFW considers riparian habitat a sensitive plant community that is valuable for a diversity of wildlife species. Riparian zones maintain shade (which is especially important for regulating water temperatures for fish), protect against windthrow, produce litterfall, provide important migratory routes for wildlife, and serve to recruit instream woody debris which provides habitats, food and shelter for invertebrates and fish. Riparian vegetation also acts as a filter strip for sedimentation from erosion sources. Based on the virtual meeting on September 17, 2020, CDFW is concerned with the placement of up to 10-foot high flood walls along long portions of the Project. CDFW recommends a buffer between the wall and the creek and recommends the area be planted with native riparian vegetation of all types, including grasses, herbs, vines, shrubs, and trees, with trees being utilized to the maximum extent possible.

The Project area should be revegetated and restored within the same season as construction following a Restoration Plan accepted in writing by CDFW. CDFW recommends habitat mapping and tree surveys be conducted to refine potential impacts prior to submitting the Restoration Plan. CDFW is available to work with the County to determine an appropriate offsite planting location as well.

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Both the on-site and potentially off-site Restoration Plan should monitor and maintain, as necessary, all plants for a minimum of ten (10) years to ensure successful revegetation. Planted trees and other vegetation should each have a minimum of 85 percent survival at the end of five years. If revegetation survival and/or cover requirements do not meet established goals, replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements should occur. Replacement plants should be monitored with the same survival and growth requirements for five years after planting.

Modifications to Corte Madera Creek

Any proposed regrading in the draft EIR should assess impacts, and at a minimum, be designed to maintain existing year-round instream habitat. The analysis should include the geomorphology of the creek upstream of the bypass outlet. CDFW recommends a critical riffle analysis utilizing CDFW's Standard Operating Procedure for Critical Riffle Analysis for Fish Passage in California.[1] This may include addressing fish passage design criteria, sediment transport, design storm elevations, scour potential, and shear stress involved in the bypass structure.

CDFW recommends implementing guidance and recommendations from the California Salmonid Stream Habitat Restoration Manual.[2] Fish passage should include rearing, foraging, osmoregulation, smoltification, and related functions necessary to support fish through a range of life stages. Avoid use of heavy geotextile fabric and minimize the use of rock riprap to the extent feasible to achieve bank stabilization. If fabric is needed, it should be made of natural, biodegradable materials. Stabilization should be achieved through integration of biological bank stabilization methods, including use of live willow cuttings and other appropriate native species.

Fish and Game Code section 5901 states that unless authorized, it is unlawful to construct or maintain a device that prevents or impedes the passing of fish up and downstream. Fish and Game Code section 45 defines "fish" as wild fish, mollusks, crustaceans, invertebrates, or amphibians, including any part, spawn or ova thereof.

Please coordinate with CDFW for technical support and assistance. CDFW supports channel naturalization and the restoration of habitat and channel complexity to support fisheries and a broad range of aquatic and riparian wildlife.

[1] https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=93986&inline
[2] https://www.wildlife.ca.gov/Grants/FRGP/Guidance

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Sea Level Rise

The State of California Sea-Level Rise Guidance/2018 Update (California Natural Resources Agency 2018) provides a science-based methodology for state and local governments to analyze and assess the risks associated with sea-level rise and incorporate sea-level rise into their planning, permitting, and investment decisions. The Marin Shoreline Sea Level Rise Vulnerability Assessment/Bay Waterfront Adaptation & Vulnerability Evaluation (BayWAVE) (Marin County 2017) provides context and estimates of the physical and fiscal impacts across the County's bayside shoreline over the coming decades. It includes sea level rise scenarios ranging from 10 inches in the near-term (15 years) to 20 inches in the medium-term (mid-century) and to 60 inches in the long-term (end of century). Since the purpose of the Project is to reduce long-term flood risk, and a portion of this downstream channel is tidal, CDFW recommends incorporating the long-term (end of century) scenarios for sea level rise, beyond the 15 year estimate, to fully evaluate Project impacts.

REGULATORY REQUIREMENTS

California Endangered Species Act

Please be advised that a CESA ITP must be obtained if the Project has the potential to result in take[3] of plants or animals listed under CESA, either during construction or over the life of the Project. Issuance of a CESA Permit is subject to CEQA documentation; the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the Project will impact CESA listed species, early consultation is encouraged, as significant modification to the project and mitigation measures may be required in order to obtain a CESA ITP.

CEQA requires a Mandatory Finding of Significance if a project is likely to substantially restrict the range or reduce the population of a threatened or endangered species. (Pub. Resources Code, §§ 21001, subd. (c), 21083; CEQA Guidelines, §§ 15380, 15064, and 15065). Impacts must be avoided or mitigated to less-than-significant levels unless the CEQA Lead Agency makes and supports Findings of Overriding Consideration (FOC). The CEQA Lead Agency's FOC does not eliminate the project proponent's obligation to comply with CESA.

Lake and Streambed Alteration Agreement

CDFW requires an LSA Notification, pursuant to Fish and Game Code section 1600 et. seq., for Project activities affecting lakes or streams and associated riparian habitat.

[3] Take is defined in Fish and Game Code section 86 as hunt, pursue, catch, capture, or kill, or attempt any of those activities.

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Notification is required for any activity that may substantially divert or obstruct the natural flow; change or use material from the bed, channel, or bank including associated riparian or wetland resources; or deposit or dispose of material where it may pass into a river, lake or stream. Work within ephemeral streams, washes, watercourses with a subsurface flow, and floodplains are subject to notification requirements. CDFW will consider the CEQA document for the Project and may issue an LSA Agreement. CDFW may not execute the final LSA Agreement until it has complied with CEQA as a Responsible Agency.

Migratory Birds and Raptors

CDFW also has authority over actions that may disturb or destroy active nest sites or take birds without authorization. Fish and Game Code sections protecting birds, their eggs, and nests include sections 3503, 3503.5, and 3513. Fully protected species may not be taken or possessed at any time (Fish and Game Code, § 3511). Migratory birds are also protected under the federal Migratory Bird Treaty Act.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special-status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form, online field survey form, and contact information for CNDDB staff can be found at the following link: https://wildlife.ca.gov/data/CNDDB/submitting-data.

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089).

CONCLUSION

CDFW appreciates the opportunity to comment on the NOP to assist the County in identifying and mitigating Project impacts on biological resources.

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Questions regarding this letter or further coordination should be directed to Ms. Amanda Culpepper, Environmental Scientist, at amanda.culpepper@wildlife.ca.gov; or Ms. Karen Weiss, Senior Environmental Scientist (Supervisory), at karen.weiss@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Gregg Erickson
BE74D4C93C604EA...

Gregg Erickson
Regional Manager
Bay Delta Region

cc: Office of Planning and Research, State Clearinghouse (SCH No. 2020080353)

REFERENCES

California Natural Resources Agency. 2018. State of California Sea-level Rise Guidance. https://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf

CDFW. 2009. California Department of Fish and Game East Marin County-San Francisco Bay Watersheds Stream Habitat Assessment Reports: Corte Madera Creek. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=94525&inline

CDFW. 2018. Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities. https://www.wildlife.ca.gov/Conservation/Survey-Protocols#377281280-plants

Love, Michael and Associates and Jeff Anderson and Associates. 2007. Corte Madera Creek Flood Control Channel Fish Passage Assessment and Alternative Analysis. September 2007.

Marin County. 2017. Marin Shoreline Sea Level Rise Vulnerability Assessment/Bay Waterfront Adaptation & Vulnerability Evaluation. Prepared by BVB Consulting LLC for Marin County Department of Public Works, June 2017. https://www.marincounty.org/-/media/files/departments/cd/planning/slr/baywave/vulnerability-assessment-final/final_allpages_bvbconsulting_reduced.pdf?la=en

USFWS. 2005. Revised Guidance on Site Assessment and Field Surveys for the California Red-legged Frog March 2005. https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/crf_survey_guidance_aug2005.pdf

STATE OF CALIFORNIA — GAVIN NEWSOM, *Governor*

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

Established in 1938

JENNIFER LUCCHESI, *Executive Officer*
(916) 574-1800 *Fax* **(916) 574-1810**
California Relay Service TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1890**

September 21, 2020

File Ref: SCH # 2020080353

Joanna Dixon
Marin County Flood Control and Water Conservation District
c/o: Panorama Environmental, Inc.
717 Market Street, Suite 650
San Francisco, CA 94103

VIA ELECTRONIC MAIL ONLY (cortemaderacreek@marincounty.org)

Subject: Notice of Preparation (NOP) for an Environmental Impact Report (EIR) for Corte Madera Creek Flood Risk Management Project, Phase 1, Marin County

Dear Ms. Dixon:

The California State Lands Commission (Commission) staff has reviewed the subject NOP for an EIR for the Corte Madera Creek Flood Risk Management Project, Phase 1 (Project), which is being prepared by the Marin County Flood Control and Water Conservation District (District). The District, as the public agency proposing to carry out the Project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The Commission is a trustee agency for projects that could directly or indirectly affect State sovereign land and their accompanying Public Trust resources or uses. Additionally, because the Project involves work on State sovereign land, the Commission will act as a responsible agency. Commission staff requests that the District consult with us on preparation of the Draft EIR as required by CEQA section 21153, subdivision (a), and the State CEQA Guidelines section 15086, subdivisions (a)(1) and (a)(2).

Commission Jurisdiction and Public Trust Lands

The Commission has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The Commission also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, subd. (c); 6009.1; 6301; 6306). All tidelands and submerged lands granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The state holds these lands for the benefit of all people of the state for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

After review of the information contained in the NOP, Commission staff has determined that the waterway, over which the proposed Project will extend, includes State-owned sovereign land, as specified above. On April 25, 1968, the Commission authorized Lease No. PRC 3926 to the Marin County Flood Control and Water Conservation District for the construction of a flood control channel northwesterly of the Bon Air Bridge. This lease expired in 2017. Therefore, a new lease application is required.

Project Description

The District proposes this Project with the primary goal to reduce the frequency and severity of flooding in the communities of Ross and Kentfield. The objectives of the Project include:

1. Flood Risk Reduction. Reduce overall flood inundation extent and depth in the Town of Ross and Kentfield areas.
2. Environmental Benefits. Improve fish passage, natural creek processes, and fish and riparian habitat adjacent to the creek.
3. Public Access and Recreational Quality. Maintain public access along the creek via the multi-use path and enhance the recreational experience and amenities along the Creek corridor to meet Town of Ross and Kentfield area community needs.
4. Operational Reliability. Improve operational reliability and reduce long-term maintenance costs through improving channel stability and protecting existing utilities.
5. Regulatory Compliance. Comply with local, state, and federal environmental laws and regulations.
6. Fiscally Responsible. Implement a flood risk reduction project that can be accomplished with local and grant funding and reasonably foreseeable grant funding opportunities.

From the Project Description, Commission staff understands that the Project would include the following component that has the potential to affect State sovereign land:

- Unit 2. Enhancement of the Creek habitat by replacing the concrete channel with an earthen channel and vegetation downstream of Stadium Way. Submerged lands downstream of Stadium Way are considered State

sovereign land. Modifying the channel would include removal of the concrete channel and installation of vegetated and unvegetated rock slope protection.

Environmental Review

Commission staff requests that the District consider the following comments when preparing the Draft EIR to ensure that impacts to State sovereign land are adequately analyzed for the Commission's use of the certified EIR to support a future lease approval for the Project.

General Comments

1. Project Description: A thorough and complete Project Description should be included in the Draft EIR in order to facilitate meaningful environmental review of potential impacts, mitigation measures, and alternatives. The Project Description should be as precise as possible in describing the details of all allowable activities (e.g., types of equipment or methods that may be used, maximum area of impact or volume of sediment removed or disturbed, seasonal work windows, locations for material disposal, etc.), as well as the details of the timing and length of activities. In particular, illustrate on figures and engineering plans and provide written description of activities occurring below the mean high tide line for Project area waterways. For the work in Unit 2, describe how the Creek would be dewatered prior to concrete removal. Thorough descriptions will facilitate Commission staff's determination of the extent and locations of its leasing jurisdiction, make for a more robust analysis of the work that may be performed, and minimize the potential for subsequent environmental analysis to be required.

Biological Resources

2. For land under the Commission's jurisdiction, the Draft EIR should disclose and analyze all potentially significant effects on sensitive species and habitats in and around the Project area, including special-status wildlife, fish, and plants, and if appropriate, identify feasible mitigation measures to reduce those impacts. The District should conduct queries of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database and U.S. Fish and Wildlife Service's (USFWS) Special Status Species Database to identify any special-status plant or wildlife species that may occur in the Project area. The Draft EIR should also include a discussion of consultation with the CDFW, USFWS, and National Marine Fisheries Service (NMFS) as applicable, including any recommended mitigation measures and potentially required permits identified by these agencies.

3. Invasive Species: One of the major stressors in California waterways is introduced species. Therefore, the Draft EIR should consider the Project's potential to encourage the establishment or proliferation of aquatic invasive species (AIS) such as the quagga mussel, or other nonindigenous, invasive species including aquatic and terrestrial plants. For example, construction boats and barges brought in from long stays at distant projects may transport new species to the Project area via hull

biofouling, wherein marine and aquatic organisms attach to and accumulate on the hull and other submerged parts of a vessel. If the analysis in the Draft EIR finds potentially significant AIS impacts, possible mitigation could include contracting vessels and barges from nearby, or requiring contractors to perform a certain degree of hull-cleaning. The CDFW's Invasive Species Program could assist with this analysis as well as with the development of appropriate mitigation (information at https://www.wildlife.ca.gov/Conservation/Invasives).

4. Construction Noise: The Draft EIR should also evaluate noise and vibration impacts on fish and birds from construction and restoration activities in the water. Mitigation measures could include species-specific work windows as defined by CDFW, USFWS, and NMFS. Again, staff recommends early consultation with these agencies to minimize the impacts of the Project on sensitive species.

Climate Change

5. Greenhouse Gas (GHG): A GHG emissions analysis consistent with the California Global Warming Solutions Act (Assembly Bill [AB] 32) and required by the State CEQA Guidelines should be included in the Draft EIR. This analysis should identify a threshold for significance for GHG emissions, calculate the level of GHGs that will be emitted as a result of construction and ultimate build-out of the Project, determine the significance of the impacts of those emissions, and, if impacts are significant, identify mitigation measures that would reduce them to the extent feasible. For the proposed Project, the removal and disposal of the concrete in Unit 2 may result in substantial emissions.

6. Sea-Level Rise: A tremendous amount of State-owned lands and resources under the Commission's jurisdiction will be impacted by rising sea levels. Because of their nature and location, these lands and resources are already vulnerable to a range of natural events, such as storms and extreme high tides. The State of California released the 2018 Update to the Safeguarding California Plan in January 2018 to provide policy guidance for state decision-makers as part of continuing efforts to prepare for climate risks. The Safeguarding Plan sets forth "actions needed" to safeguard ocean and coastal ecosystems and resources as part of its policy recommendations for state decision-makers.

   In addition, Governor Brown issued Executive Order B-30-15 in April 2015, which directs state government to fully implement the Safeguarding Plan and factor in climate change preparedness in planning and decision making. Commission staff believes the goals of the proposed Project are consistent with the guidance and recommendations presented in the Safeguarding Plan, and that Project would benefit coastal management agencies' efforts to plan for more resilient shorelines and minimize adverse ecosystem impacts resulting from sea-level rise.

   Please note that when considering lease applications, Commission staff will (1) request information from applicants concerning the potential effects of sea-level rise on their proposed projects, (2) if applicable, require applicants to indicate how they

plan to address sea-level rise and what adaptation strategies are planned during the projected life of their projects, and (3) where appropriate, recommend project modifications that would eliminate or reduce potentially adverse impacts from sea-level rise, including adverse impacts on public access. Therefore, this information should be included in the Draft EIR.

Cultural Resources

7. Title to Resources: The Draft EIR should also mention that the title to all abandoned archaeological sites and historic or cultural resources on or in the submerged lands of California is vested in the state and under the jurisdiction of the Commission (Pub. Resources Code, § 6313). Commission staff requests that the District consult with Staff Attorney Jamie Garrett, should any cultural resources on State lands be discovered during construction of the proposed Project. In addition, Commission staff requests that the following statement be included in the EIR's Mitigation and Monitoring Plan: "The final disposition of archaeological, historical, and paleontological resources recovered on state lands under the jurisdiction of the California State Lands Commission must be approved by the Commission."

Thank you for the opportunity to comment on the NOP for the Project. As a trustee and responsible agency, Commission staff requests that you consult with us on this Project and keep us advised of changes to the Project Description and all other important developments. Please send additional information on the Project to the Commission staff listed below as the Draft EIR is being prepared.

Please refer questions concerning environmental review to Cynthia Herzog, Senior Environmental Scientist, at (916) 574-1310 or cynthia.herzog@slc.ca.gov. For questions concerning archaeological or historic resources under Commission jurisdiction, please contact Staff Attorney Jamie Garrett, at (916) 574-0398 or at jamie.garrett@slc.ca.gov. For questions concerning Commission leasing jurisdiction, please contact Al Franzoia, Public Land Management Specialist, at (916) 574-0992 or al.franzoia@slc.ca.gov.

Sincerely,

Eric Gillies, Acting Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
J. Garrett, Commission
A. Franzoia, Commission
C. Herzog, Commission

TOWN OF ROSS

September 17, 2020

Marin County Flood Control and Water Conservation District
c/o Joanna Dixon, P.E.
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903

RE: CORTE MADERA CREEK FLOOD RISK MANAGEMENT PROJECT PHASE 1: COMMENTS ON THE AUGUST 27, 2020 SCOPING MEETING FOR THE PROPOSED DRAFT ENVIRONMENTAL IMPACT REPORT

Dear Ms. Dixon:

Thank you for the opportunity to provide comments regarding the Corte Madera Creek Flood Risk Management Project (the Project) Environmental Impact Report (EIR) scoping meeting. The Town of Ross appreciates the outreach efforts of the Marin County Flood Control District staff and will continue to support any planning efforts which facilitate flood risk reduction measures in the Ross Valley basin. The Town of Ross, as a major stakeholder, a responsible agency, and as a partner, wants to ensure that the level of information and analysis provided by the EIR is sufficient to adequately evaluate the potential project impacts that are likely to occur within the Town.

With respect to these concerns and for your consideration, the Town provides the following comments on the scope of the Project EIR:

- The EIR must analyze an alternative that proposes removal of the fish ladder with a nominal transition back to the existing concrete channel and little or no impact to the existing Frederick Allen Park (i.e. the "fish ladder only" alternative.)

- The EIR project description, goals, and objectives should be written such that they do not preclude the approval of a "fish ladder only" alternative for the portions of the project within the Town of Ross.

- The Town is concerned with the environmental impacts associated with the proposed reconfiguration of Frederick Allen Park (the Park) into a floodplain park. The EIR must provide adequate and detailed information and mitigation measures related to the extent of grading, tree removal and replacement, landscaping, and continued pedestrian and bicycle access. The existing Park has established mature vegetation and provides tree covered pedestrian and bicycle access from Kentfield to the Town of Ross along the creek corridor and the resultant project will result in a more open corridor that has limited vegetation and relief from sun exposure for people and fish. The EIR should identify all the potential CEQA impacts related to replacing the existing Park with the proposed floodplain park including the following information:

    - Earth disturbance and quantity of cubic yards of off-haul.

P.O. BOX 320, ROSS, CA 94957-0320
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www.townofross.org

- A detailed list of the type, number, size, and location of trees to be removed within the Park and within the overall Riparian Corridor.
- Number of trees and species to be removed and replanted in Frederick Allen Park and within the overall Riparian Corridor.
- The impacts related to the lack of shade and habitat during the initial years of growth of younger replacement trees including at completion of construction, at 5 years after, and at 10 years after construction.
- The impact of sediment buildup within the proposed floodplain and associated maintenance responsibilities.
- The location and amount of pedestrian and multi-purpose paths.
- A project diagram showing the specific locations of the walls within the Frederick Allen Park Corridor and the proposed creek streambed that meanders through the Corridor should be provided.
- A fencing plan and where construction staging, and storage of materials will be located.
- Mechanisms and procedures to keep the public safe during high water events.
- Maintenance responsibilities of the proposed floodplain and the park.

– The EIR should illustrate the comparison of the 10-year and the 25-year flood risk reduction benefits under existing, existing with cumulative impacts, and proposed project conditions for all alternatives and including the "fish ladder only" alternative for the entire reach of Corte Madera Creek between San Anselmo and Kentfield and including all drainage tributaries within Ross.

– The EIR should recognize the Town of Ross as both an integrated regulatory agency in the review process for design and construction activities, and as a landowner pertaining to Fredrick Allen Park and that the Town of Ross Planning, Building, and Public Works Departments are included in the appropriate sections as having regulatory jurisdiction within the Town limits and public rights of way.

Thank you in advance for considering the Town of Ross' comments and incorporating them into the Corte Madera Creek Flood Risk Management Project Phase 1 EIR.

Sincerely,

Joe Chinn
Town Manager

cc: Mayor Julie McMillan and Council Members

September 21, 2020

Joanna Dixon
Marin County Department of Public Works
3501 Civic Center Drive
San Francisco, CA 04903
cortemaderacreek@marincounty.org

RE: Scoping Comments on the Corte Madera Flood Risk Management Project.

Dear Ms. Dixon,

Thank you for the opportunity to submit scoping comments on the Corte Madera Flood Risk Management Project Draft Environmental Impact Report. Removing the concrete channel has been far too long in coming. This channel has minimal to no habitat value and has not even done much for flooding. Discussed below are a few issues we want the DEIR to discuss, toward the goal of ensuring that environmental benefits of the project are maximized.

The project would have many environmental benefits. It would restore much of the creek to a more natural condition, improve riparian habitat, remove the concrete lining, remove the inadequate fish ladder, and improve fish resting pools. The points that we request are:

1. Floodwall:

It is unfortunate that, due to development along the creek, the project must include long floodwalls. It appears that the proposed walls would be straight and smooth-sided - devoid of benefit for wildlife, as is the usual design for floodwalls. Instead of a smooth wall throughout, we suggest that designs be considered that would provide some habitat value.

For a sea wall project it is considering, the Port of San Francisco has researched designs for walls that have spaces of various size and shapes that can support aquatic habitat, vegetation and small creatures. While the Corte Madera Creek walls are not inundated frequently enough to warrant such designs throughout; they could be beneficial in the lower levels of the section that is frequently inundated. We also note that such designs will be increasingly useful as sea level rise progresses.

Examples of possible designs are included in a Power Point the Port of San Francisco presented to the SF Bay Joint Venture Conservation Delivery Committee in August 2020 to support their request for the JVs support. There is a link to this presentation in the body of the email message conveying this letter and the link is also included as an attachment.

We suggest that one or more of the designs be evaluated for use in the wall length within the tidal range, i.e. that is covered with algae in the photos of the scoping presentation for the project. The DEIR should discuss which of the various designs would be appropriate for the sea walls on Corte Madera Creek, i.e., which would provide substrate that supports species found in Corte Madera Creek.

One or even more of these wall designs should be added to the project to provide habitat on the floodwall, unless there is strong reason that such designs would have adverse impacts. The design(s) that is or are most appropriate for supporting species native to Corte Madera Creek should be used.

2. Public Access:

At the scoping hearing for the project, it was reported that the project will include steps down to the creek. While steps to the creek might appeal to some, they would have a number of adverse impacts. The DEIR should address the following: What is the purpose of the steps; are the steps intended to allow people to view the water, or go into or play in the water?

What are the potential impacts to fish and birds attempting to feed or rest in the creek? We are concerned that use of the steps would result in the creek waters in the vicinity being reduced in habitat value for wildlife, particularly birds. Usually more wildlife can be viewed from further away, i.e. from the trail on the top of the bank. Many studies have confirmed that wildlife leave when humans come close, and we would expect that would occur here.

There are also potential adverse impacts to people. We would expect that some folks, particularly young people, would be drawn to, and even into, the water. Discuss the risk of folks getting hurt, drowning or being adversely affected by poor water quality. Discuss the legal risk to the county should someone get sick, be hurt or drown.

3. Alternatives Analysis.

Analyze an alternative that does not include the section of the project in Ross.

We understand there is not clear support for the project from the Town of Ross. It is important to have an alternative that will allow a project to move forward without delay, even if the Ross Town Council does not support it. There also should not be delay due to inadequate environmental review. Therefore, the DEIR should address a

reduced project alternative that does not include the sections in the Town of Ross that the Ross council does not support.

The project will have many public benefits: flood control improvements for many residents and improved habitat for special status fish and birds. Critical funding would be lost if the project does not proceed now. The project should move forward with no delay so that these benefits would not be lost or delayed. To best assure that such an outcome can occur, a reduced project without the section in Ross should be evaluated in the DEIR.

Thank you for responding to our concerns.

Sincerely,

Barbara Salzman, Co-chair
Conservation Committee

Phil Peterson, Co-chair
Conservation Committee

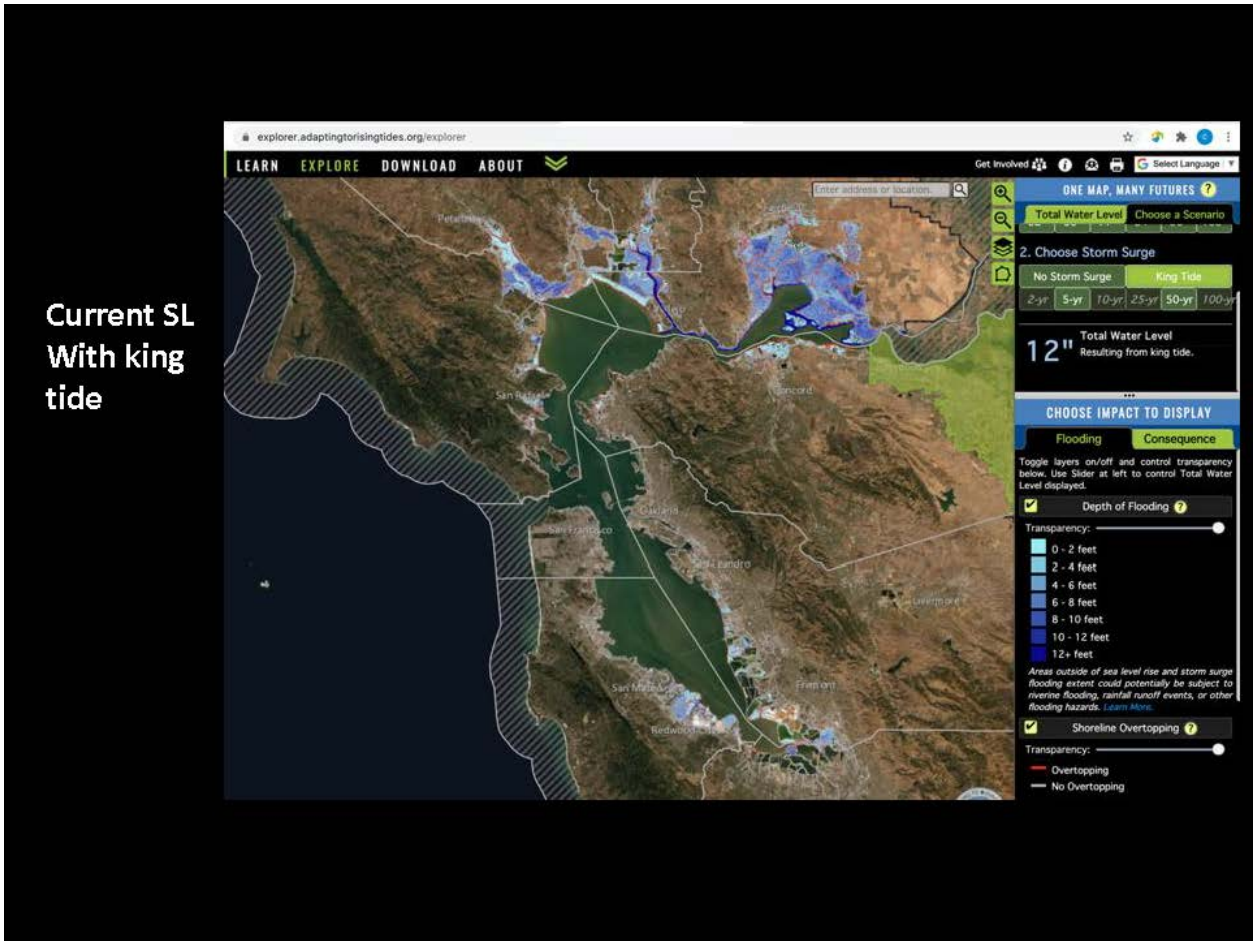
Enhancing habitat for rocky shore species in the face of SLR
Chela Zabin, PhD
Smithsonian Environmental Research Center & Estuary & Ocean Science Center, Tiburon CA
PORT
Smithsonian Environmental Research Center

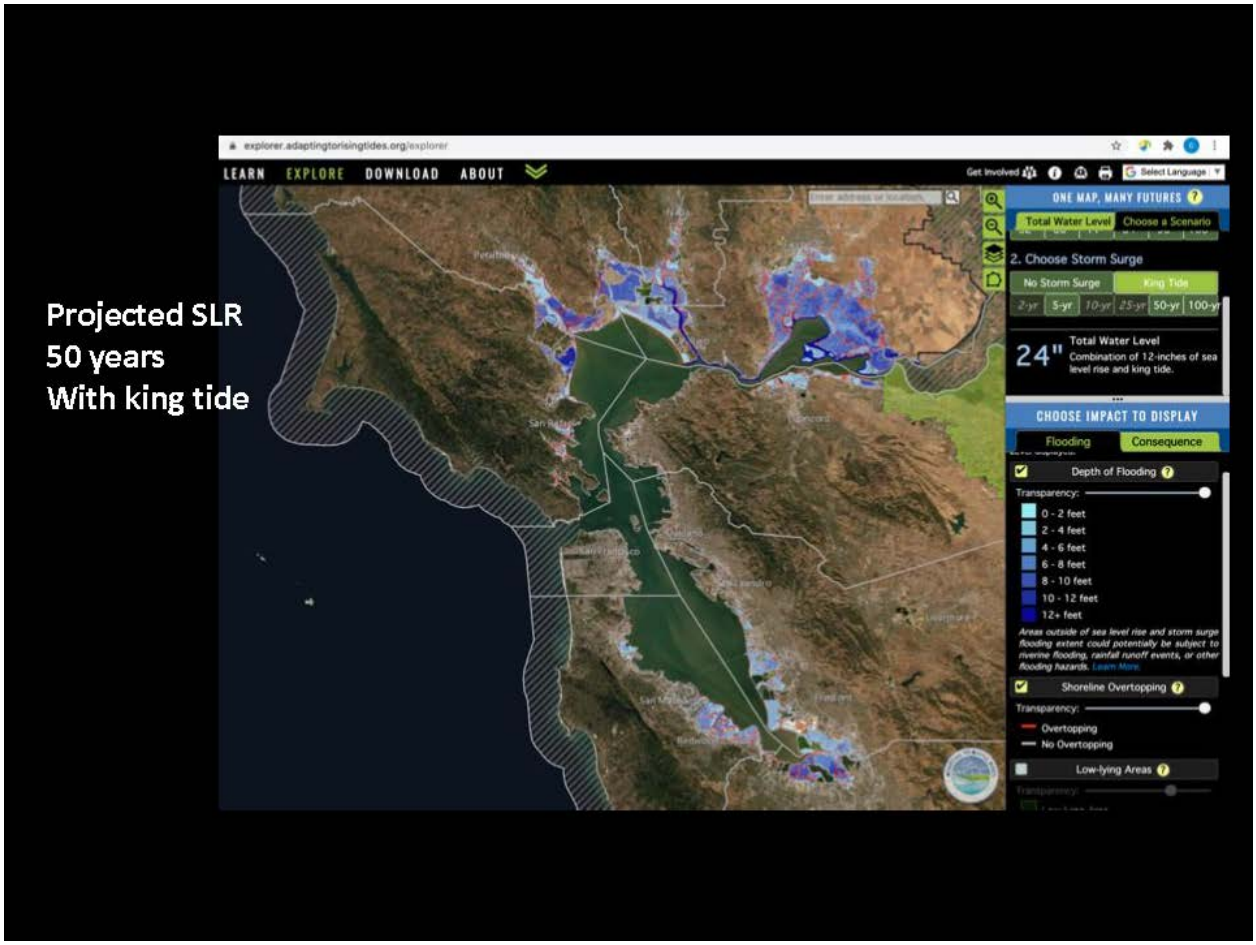
Smithsonian Environmental Research Center

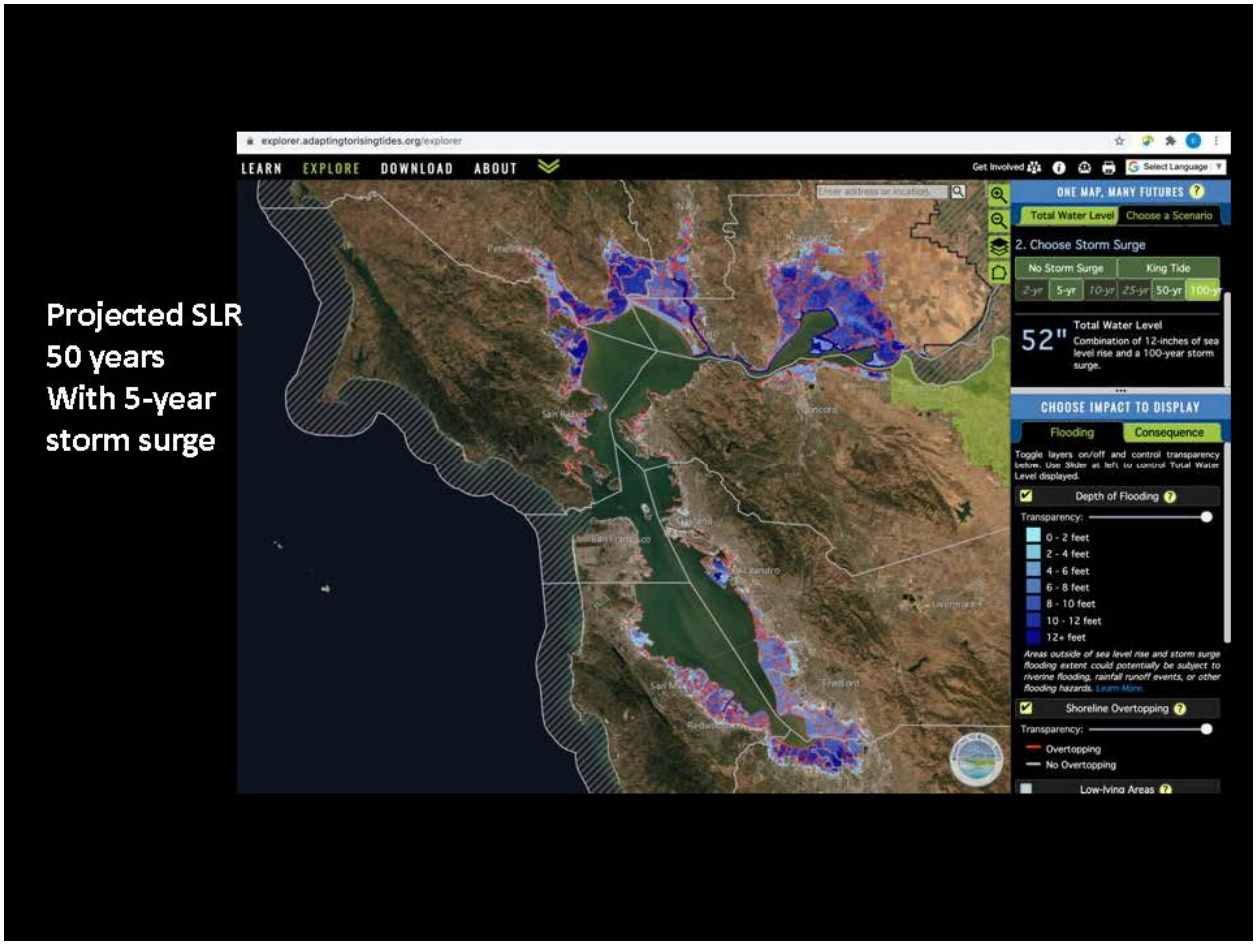
SERC-West

Edgewater, MD
(Chesapeake Bay)

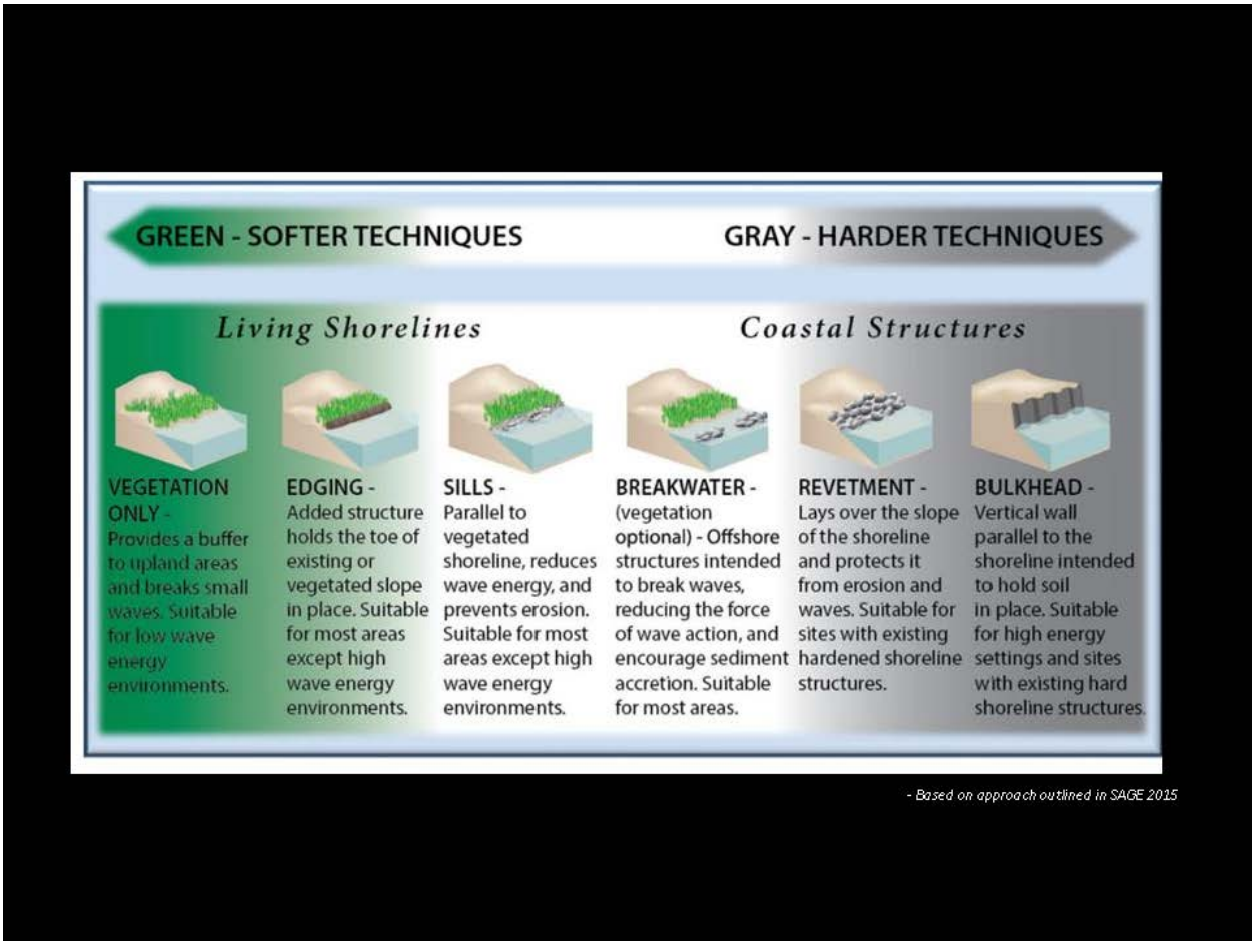
At SFSU's Estuary & Ocean Science Center since 2000)

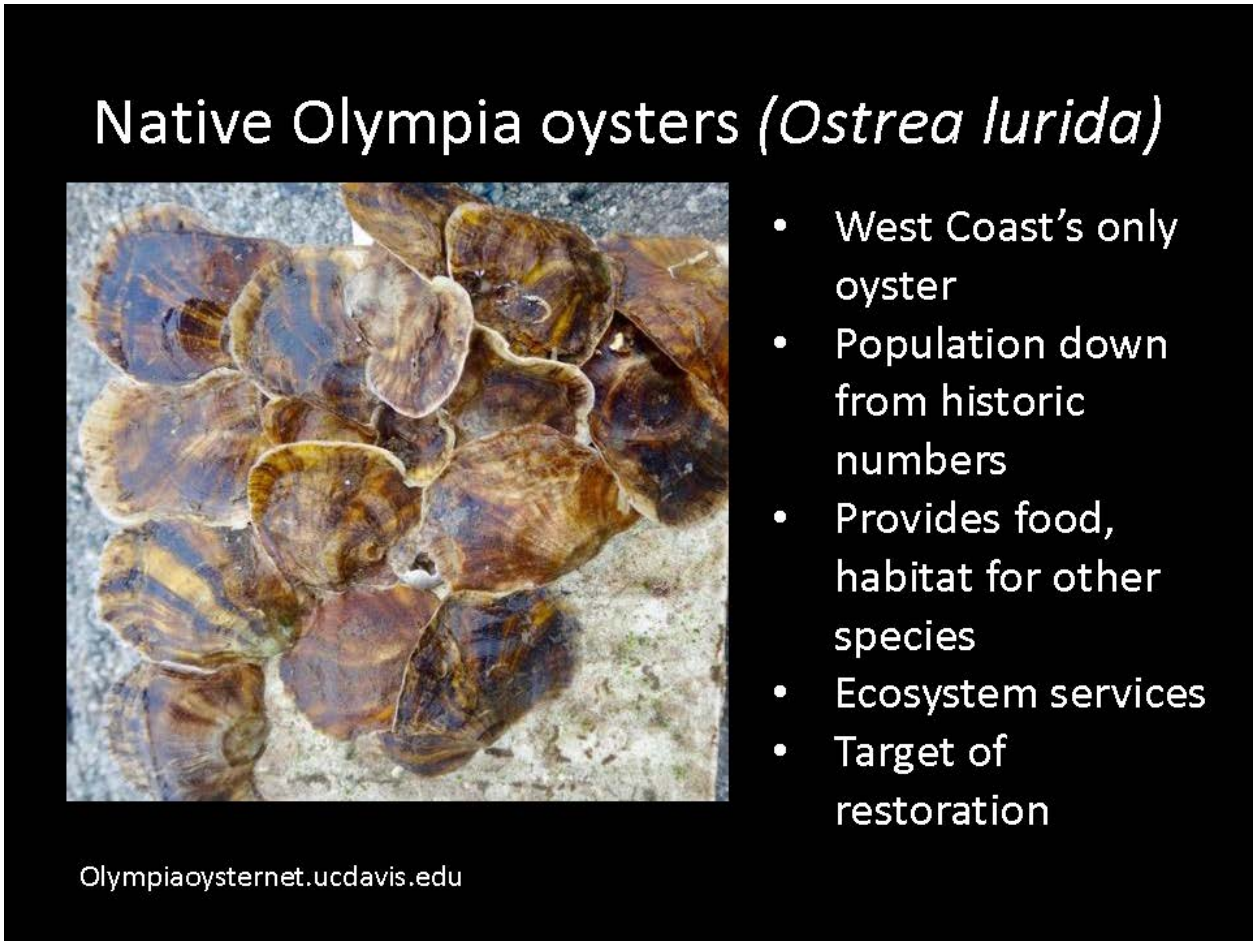

Current SL
With king
tide
explorer.adaptingtorisingtides.org/explorer
LEARN
EXPLORE
DOWNLOAD
ABOUT
Get Involved
Select Language
Enter address or location
ONE MAP, MANY FUTURES
Total Water Level
Choose a Scenario
2. Choose Storm Surge
No Storm Surge
King Tide
2-yr
5-yr
10-yr
25-yr
50-yr
100-yr
12"
Total Water Level
Resulting from king tide.
CHOOSE IMPACT TO DISPLAY
Flooding
Consequence
Toggle layers on/off and control transparency below. Use Slider at left to control Total Water Level displayed.
Depth of Flooding
Transparency:
0 - 2 feet
2 - 4 feet
4 - 6 feet
6 - 8 feet
8 - 10 feet
10 - 12 feet
12+ feet
Areas outside of sea level rise and storm surge flooding extent could potentially be subject to riverine flooding, rainfall runoff events, or other flooding hazards. Learn More.
Shoreline Overtopping
Transparency:
Overtopping
No Overtopping
Petaluma
San Rafael
Concord
Oakland
San Francisco
San Leandro
Livermore
San Mateo
Fremont
Redwood City


Projected SLR
50 years
With king tide
explorer.adaptingtorisingtides.org/explorer
LEARN
EXPLORE
DOWNLOAD
ABOUT
ONE MAP, MANY FUTURES
Total Water Level
Choose a Scenario
2. Choose Storm Surge
No Storm Surge
King Tide
2-yr
5-yr
10-yr
25-yr
50-yr
100-yr
24"
Total Water Level
Combination of 12-inches of sea level rise and king tide.
CHOOSE IMPACT TO DISPLAY
Flooding
Consequence
Depth of Flooding
Transparency:
0 - 2 feet
2 - 4 feet
4 - 6 feet
6 - 8 feet
8 - 10 feet
10 - 12 feet
12+ feet
Areas outside of sea level rise and storm surge flooding extent could potentially be subject to riverine flooding, rainfall runoff events, or other flooding hazards. Learn More
Shoreline Overtopping
Transparency:
Overtopping
No Overtopping
Low-lying Areas


Projected SLR
50 years
With 5-year
storm surge
explorer.adaptingtorisingtides.org/explorer
LEARN
EXPLORE
DOWNLOAD
ABOUT
Get Involved
Select Language
ONE MAP, MANY FUTURES
Total Water Level
Choose a Scenario
2. Choose Storm Surge
No Storm Surge
King Tide
2-yr
5-yr
10-yr
25-yr
50-yr
100-yr
52"
Total Water Level
Combination of 12-inches of sea level rise and a 100-year storm surge.
CHOOSE IMPACT TO DISPLAY
Flooding
Consequence
Toggle layers on/off and control transparency below. Use Slider at left to control Total Water Level displayed.
Depth of Flooding
Transparency:
0 - 2 feet
2 - 4 feet
4 - 6 feet
6 - 8 feet
8 - 10 feet
10 - 12 feet
12+ feet
Areas outside of sea level rise and storm surge flooding extent could potentially be subject to riverine flooding, rainfall runoff events, or other flooding hazards. Learn More.
Shoreline Overtopping
Transparency:
Overtopping
No Overtopping
Low-lying Areas

Shrinking intertidal habitats


GREEN - SOFTER TECHNIQUES
GRAY - HARDER TECHNIQUES
Living Shorelines
Coastal Structures
VEGETATION ONLY - Provides a buffer to upland areas and breaks small waves. Suitable for low wave energy environments.
EDGING - Added structure holds the toe of existing or vegetated slope in place. Suitable for most areas except high wave energy environments.
SILLS - Parallel to vegetated shoreline, reduces wave energy, and prevents erosion. Suitable for most areas except high wave energy environments.
BREAKWATER - (vegetation optional) - Offshore structures intended to break waves, reducing the force of wave action, and encourage sediment accretion. Suitable for most areas.
REVETMENT - Lays over the slope of the shoreline and protects it from erosion and waves. Suitable for sites with existing hardened shoreline structures.
BULKHEAD - Vertical wall parallel to the shoreline intended to hold soil in place. Suitable for high energy settings and sites with existing hard shoreline structures.
- Based on approach outlined in SAGE 2015


Native Olympia oysters (Ostrea lurida)
West Coast's only oyster
Population down from historic numbers
Provides food, habitat for other species
Ecosystem services
Target of restoration
Olympiaoysternet.ucdavis.edu

Rockweed *(Fucus distchus)*

- Mid- high intertidal zone
- Foundation species
- Provides food, habitat for other species
- Not good at dispersing
- Target for mitigation funding

Pacific herring *(Clupea pallasii)*

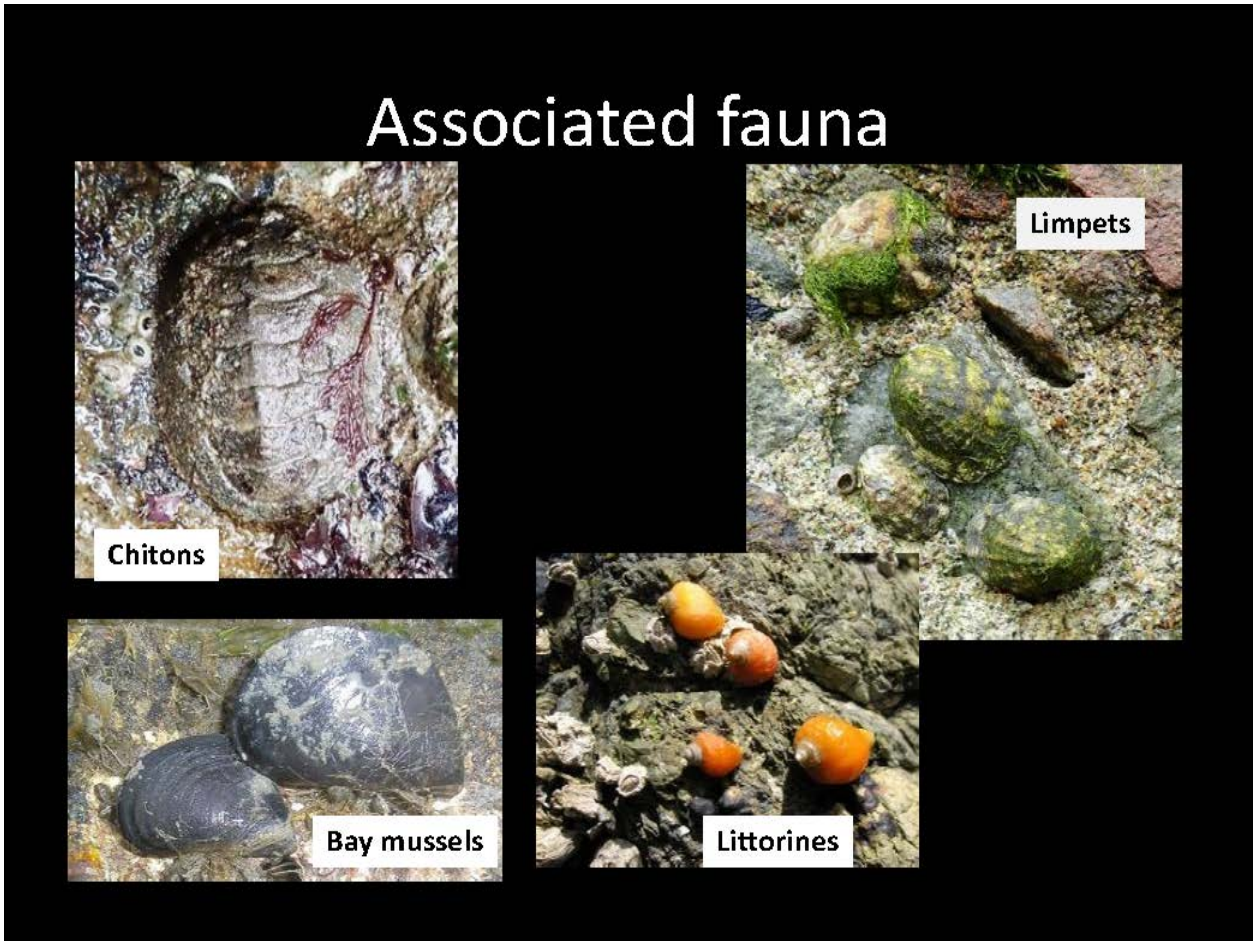
- Supports Bay food webs
- Commercial fishery
- Requires hard substrate for spawning

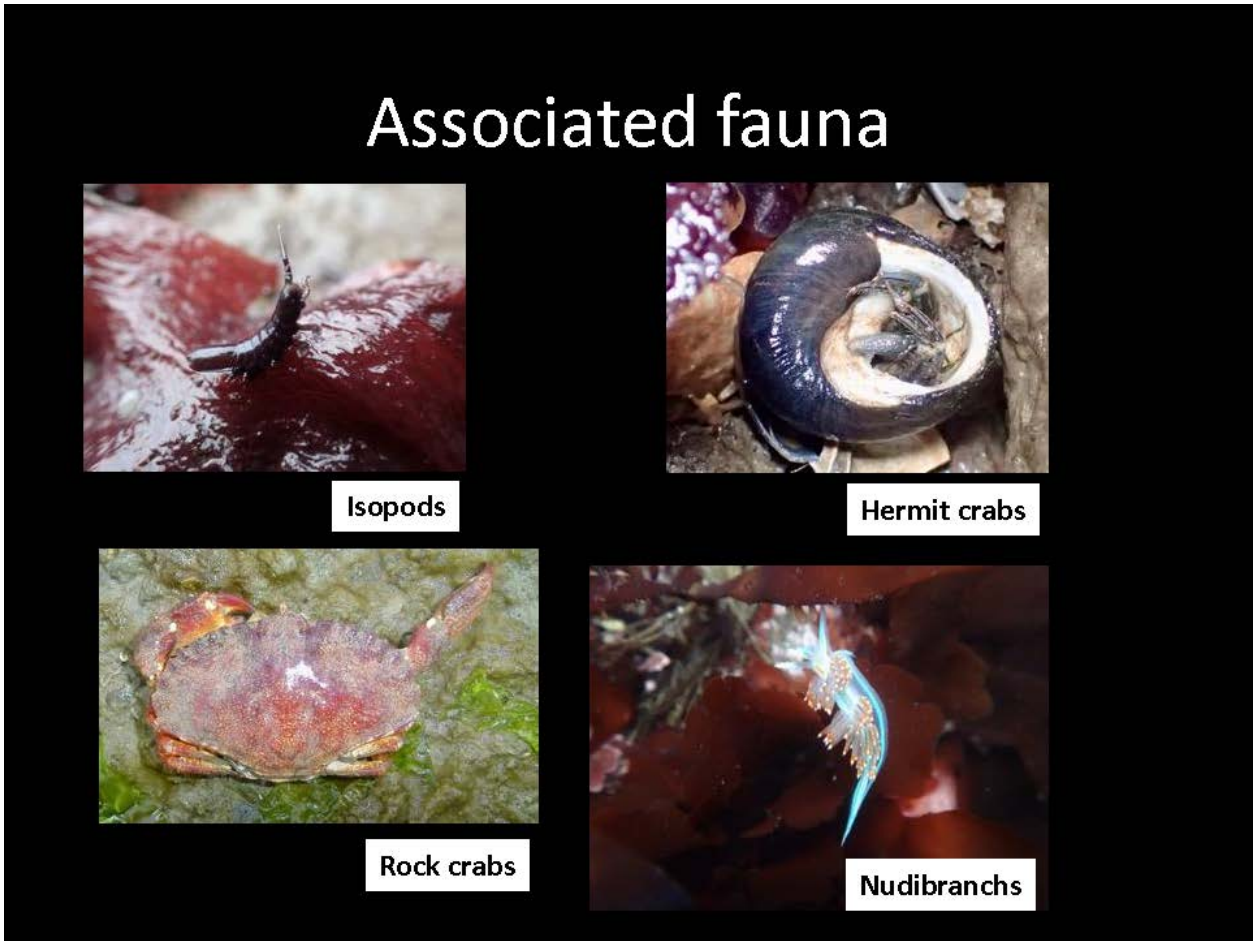
Pacific herring spawning

-Watters et al. 2004

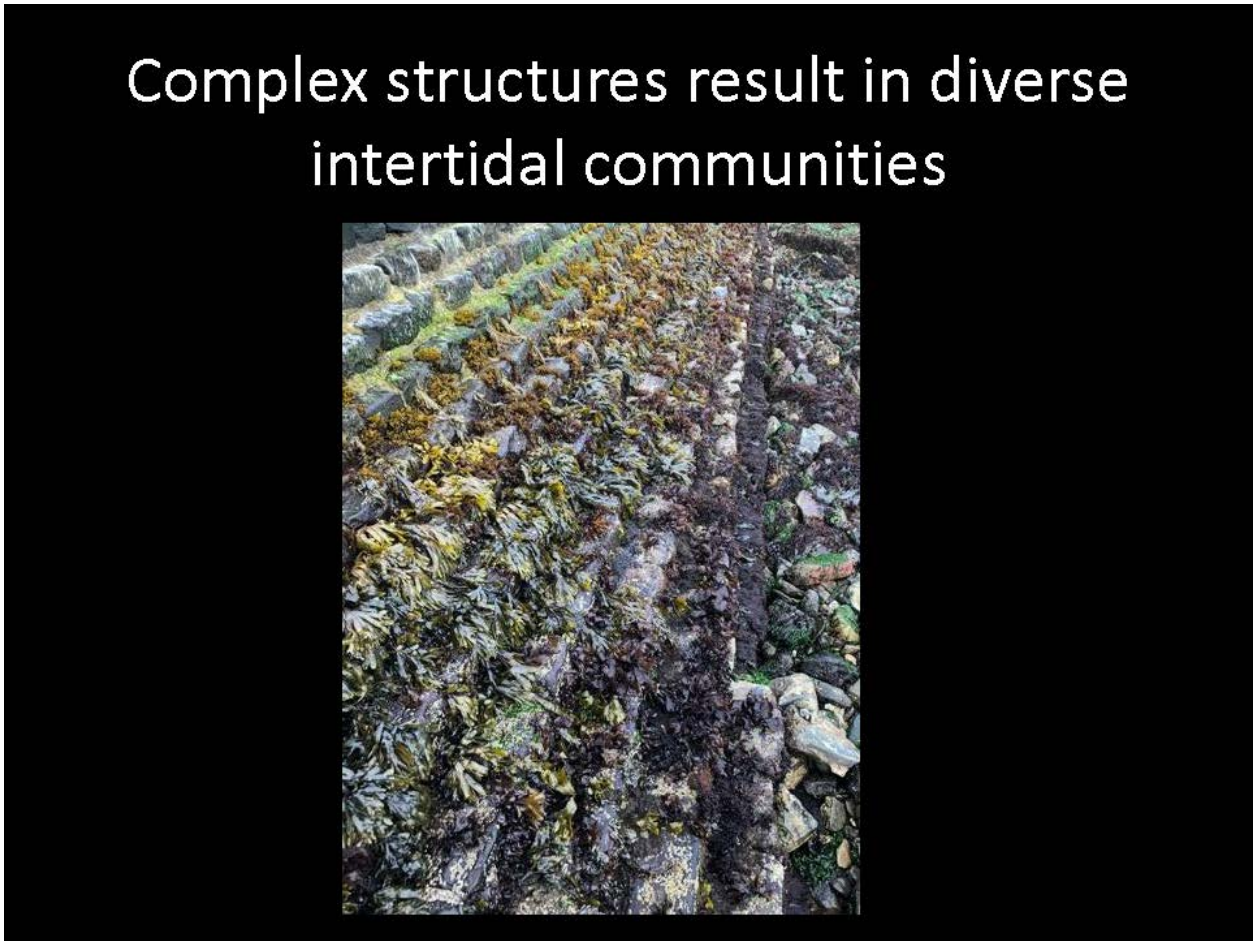
- Macroalgae substrate for herring eggs

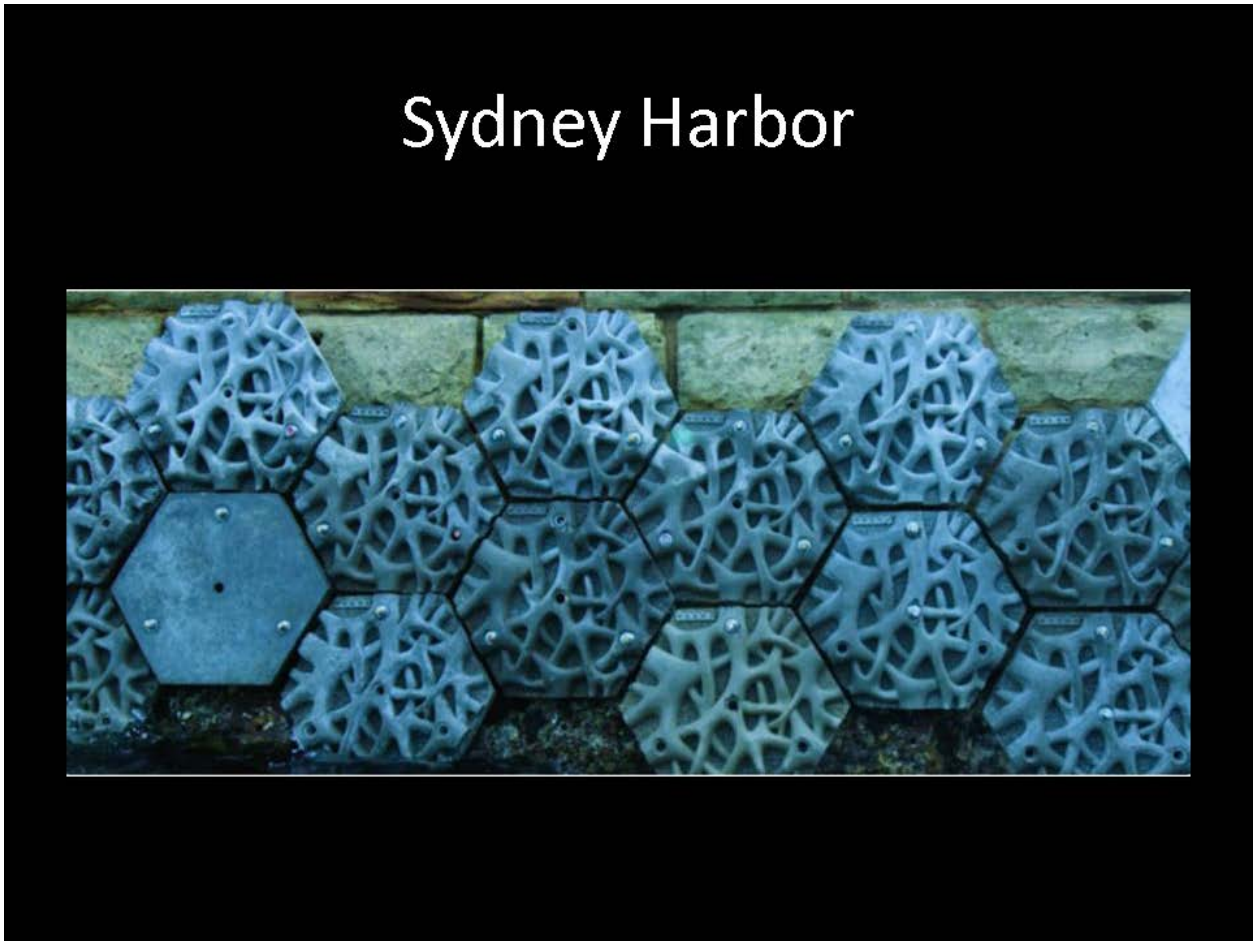
Rocky shore communities
Feather boa kelp
Rainbow sea weed
Red seaweed


Associated fauna
Chitons
Limpets
Bay mussels
Littorines

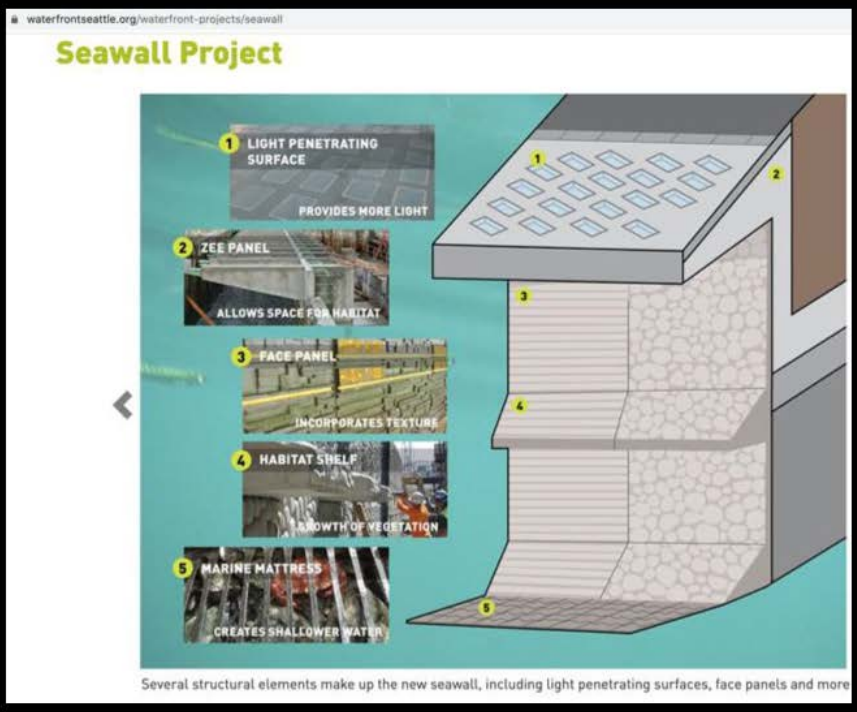

Associated fauna
Isopods
Hermit crabs
Rock crabs
Nudibranchs

Seawalls that mimic nature
Crevices, grooves, pits
Tide pools
Interstitial spaces
- Office of Environment and Heritage, NSW 2012

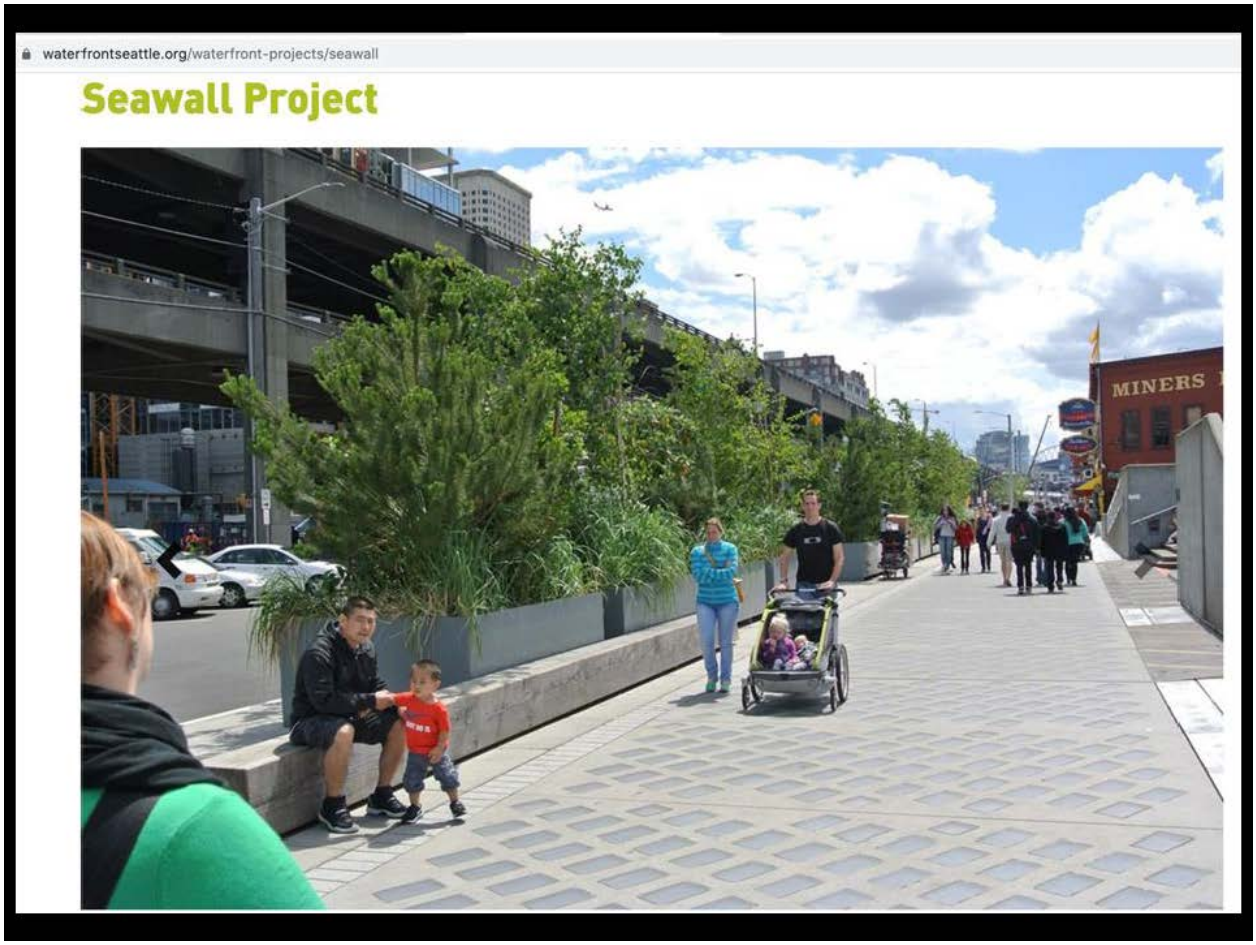

Complex structures result in diverse intertidal communities

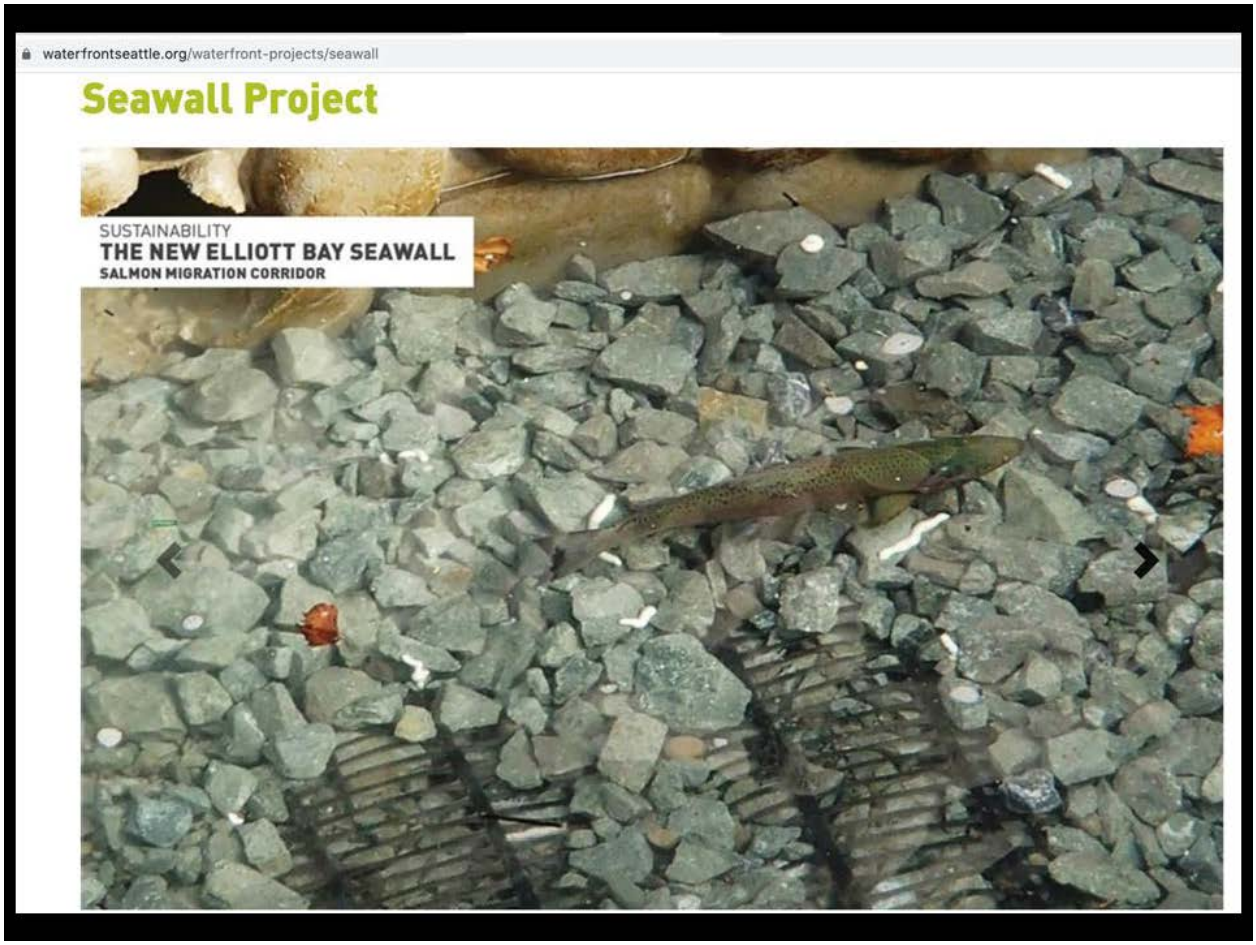

Sydney Harbor

Seattle Seawall

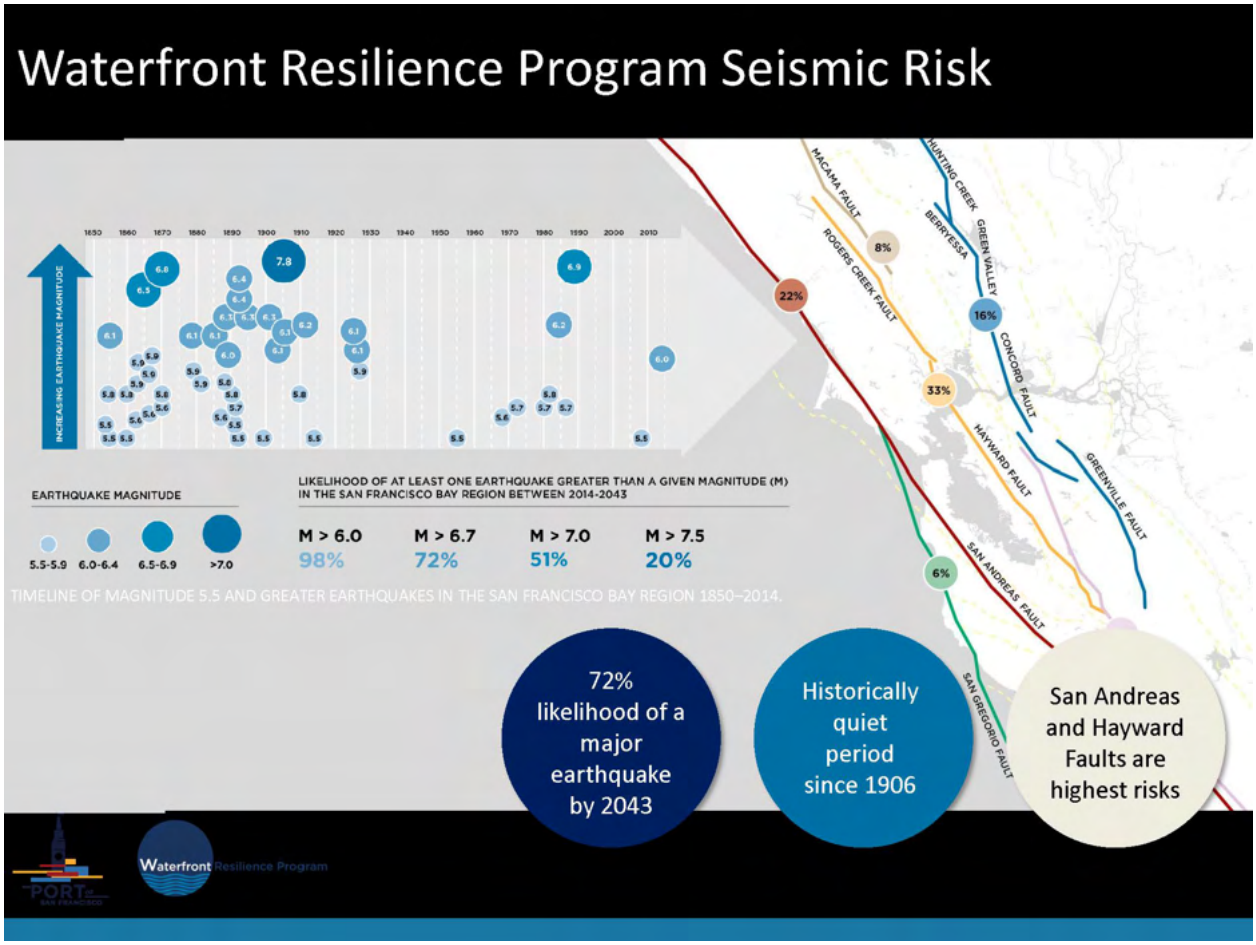


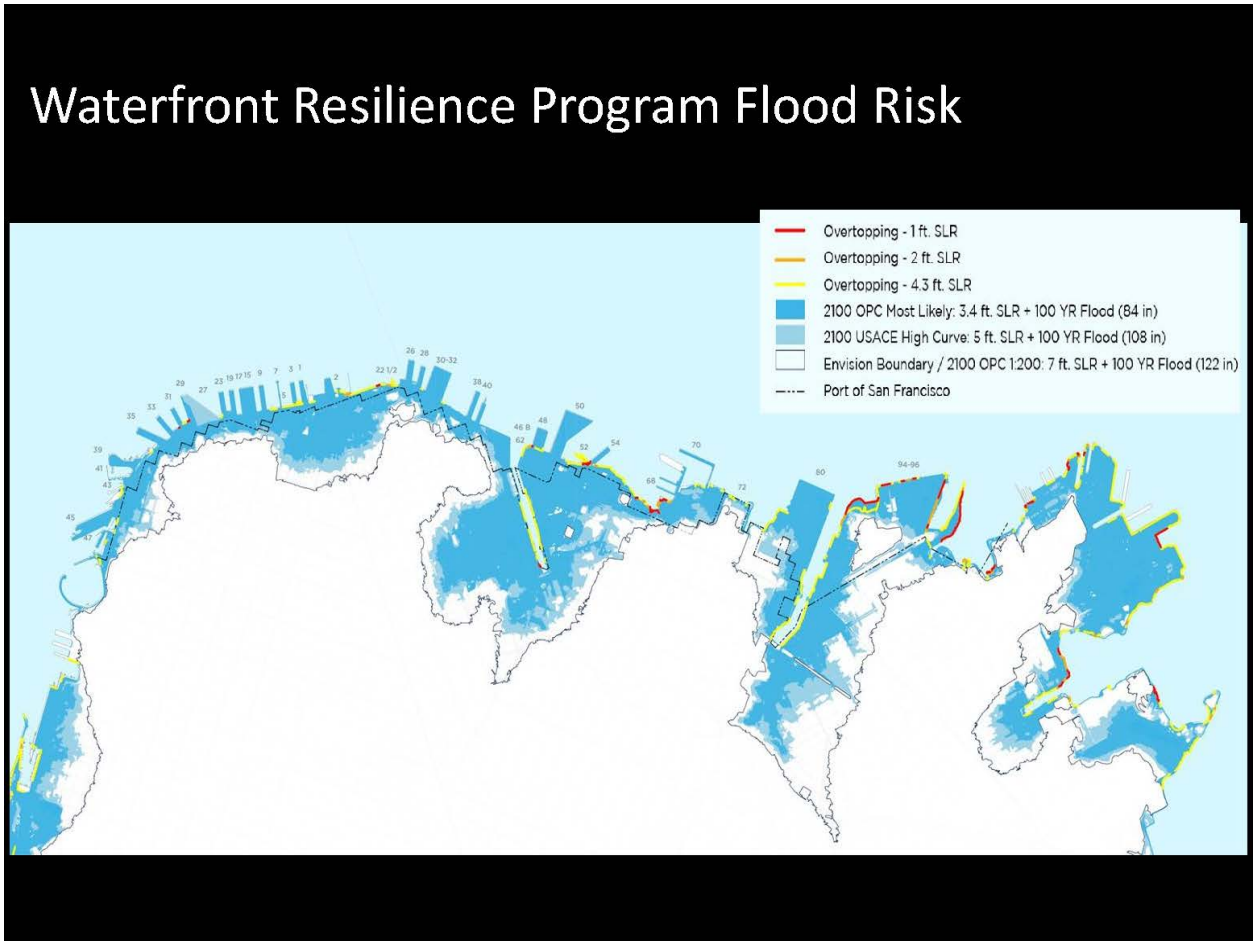
waterfrontseattle.org/waterfront-projects/seawall
Seawall Project
HIGH HIGH
HIGH TIDE

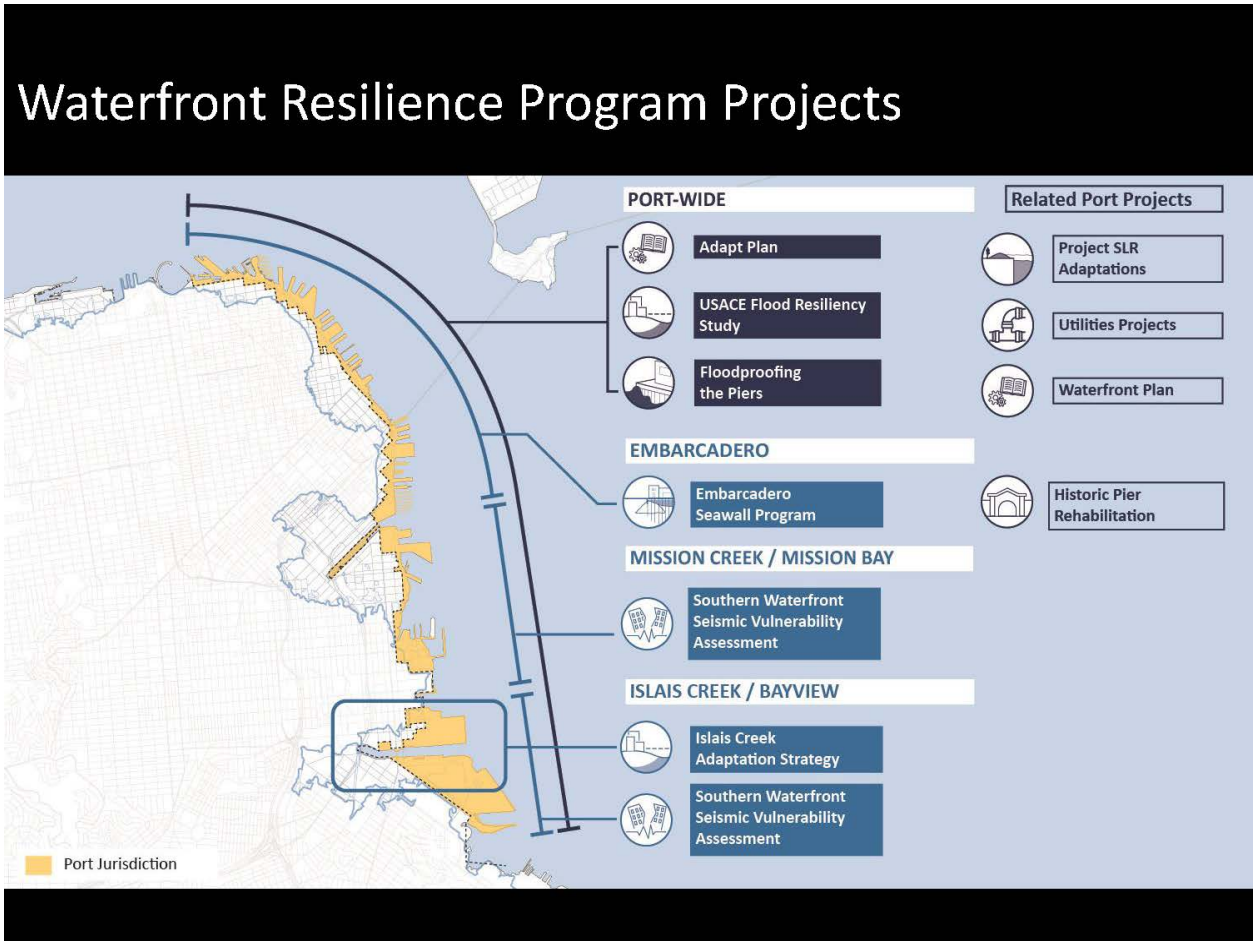

waterfrontseattle.org/waterfront-projects/seawall
Seawall Project
MINERS


waterfrontseattle.org/waterfront-projects/seawall
Seawall Project
SUSTAINABILITY
THE NEW ELLIOTT BAY SEAWALL
SALMON MIGRATION CORRIDOR

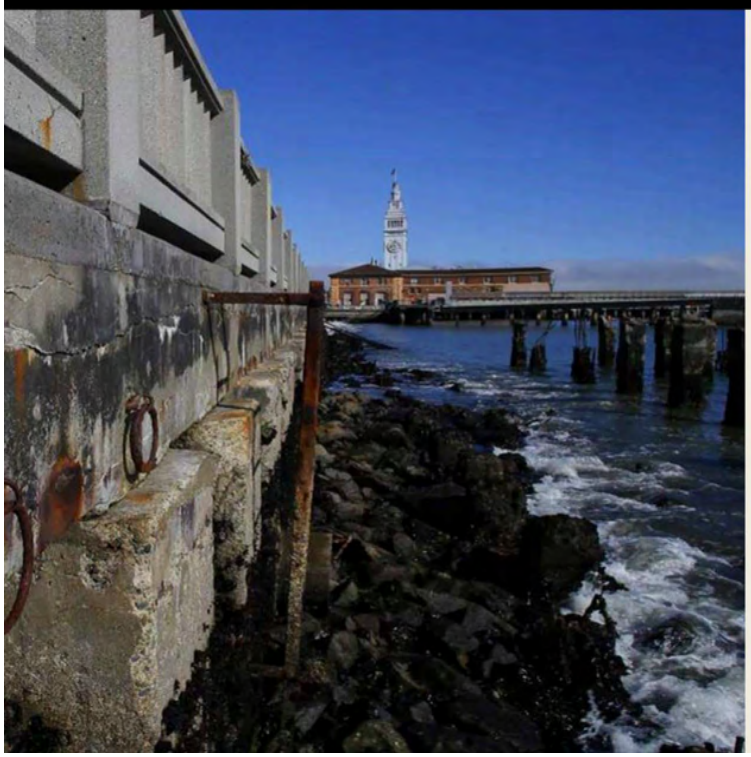
Port of San Francisco's Waterfront Resilience Program
The Port of San Francisco's Waterfront Resilience Program will create a safe, equitable, sustainable, and inspiring waterfront.


Waterfront Resilience Program Seismic Risk
INCREASING EARTHQUAKE MAGNITUDE
EARTHQUAKE MAGNITUDE
5.5-5.9
6.0-6.4
6.5-6.9
>7.0
LIKELIHOOD OF AT LEAST ONE EARTHQUAKE GREATER THAN A GIVEN MAGNITUDE (M) IN THE SAN FRANCISCO BAY REGION BETWEEN 2014-2043
M > 6.0
98%
M > 6.7
72%
M > 7.0
51%
M > 7.5
20%
TIMELINE OF MAGNITUDE 5.5 AND GREATER EARTHQUAKES IN THE SAN FRANCISCO BAY REGION 1850–2014.
MACAMA FAULT
ROGERS CREEK FAULT
HUNTING CREEK
BERRYESSA
GREEN VALLEY
CONCORD FAULT
HAYWARD FAULT
GREENVILLE FAULT
SAN ANDREAS FAULT
SAN GREGORIO FAULT
22%
8%
16%
33%
6%
72% likelihood of a major earthquake by 2043
Historically quiet period since 1906
San Andreas and Hayward Faults are highest risks
Waterfront Resilience Program


Waterfront Resilience Program Flood Risk
Overtopping - 1 ft. SLR
Overtopping - 2 ft. SLR
Overtopping - 4.3 ft. SLR
2100 OPC Most Likely: 3.4 ft. SLR + 100 YR Flood (84 in)
2100 USACE High Curve: 5 ft. SLR + 100 YR Flood (108 in)
Envision Boundary / 2100 OPC 1:200: 7 ft. SLR + 100 YR Flood (122 in)
Port of San Francisco


Waterfront Resilience Program Projects
PORT-WIDE
Adapt Plan
USACE Flood Resiliency Study
Floodproofing the Piers
EMBARCADERO
Embarcadero Seawall Program
MISSION CREEK / MISSION BAY
Southern Waterfront Seismic Vulnerability Assessment
ISLAIS CREEK / BAYVIEW
Islais Creek Adaptation Strategy
Southern Waterfront Seismic Vulnerability Assessment
Related Port Projects
Project SLR Adaptations
Utilities Projects
Waterfront Plan
Historic Pier Rehabilitation
Port Jurisdiction

Waterfront Resilience Program
Embarcadero Seawall Project



- **Project Area:** Fisherman's Wharf to Mission Creek
- **Timing:** 2017 to 2021 project planning followed by implementation / construction
- **Focus:** Seismic and flood risk associated with the Embarcadero Seawall
- **Funding:** $425 million General Obligation Bond passed in November 2018

Waterfront Resilience Program
USACE Flood Resiliency Study

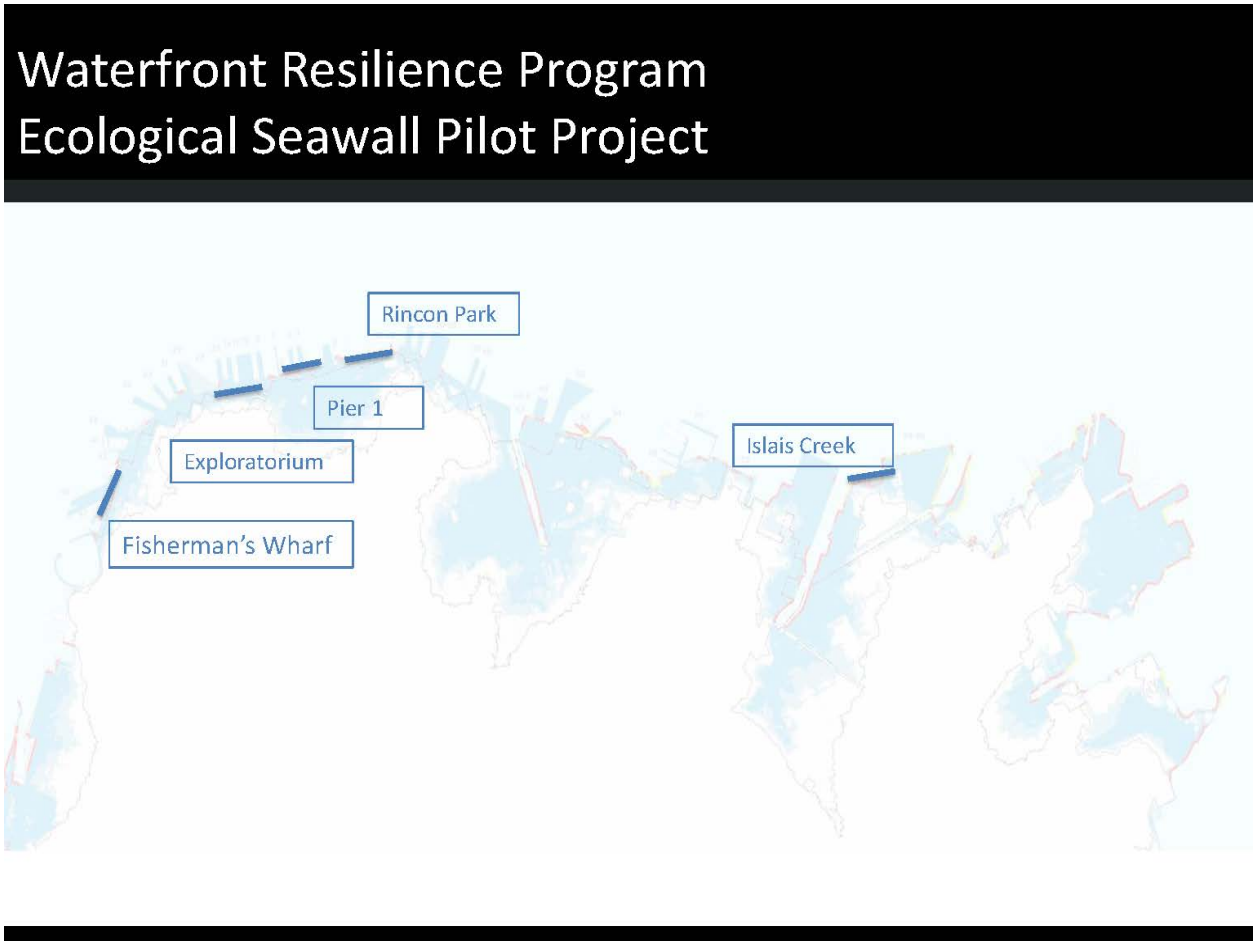
Project Area: Aquatic Park to Heron's Head Park

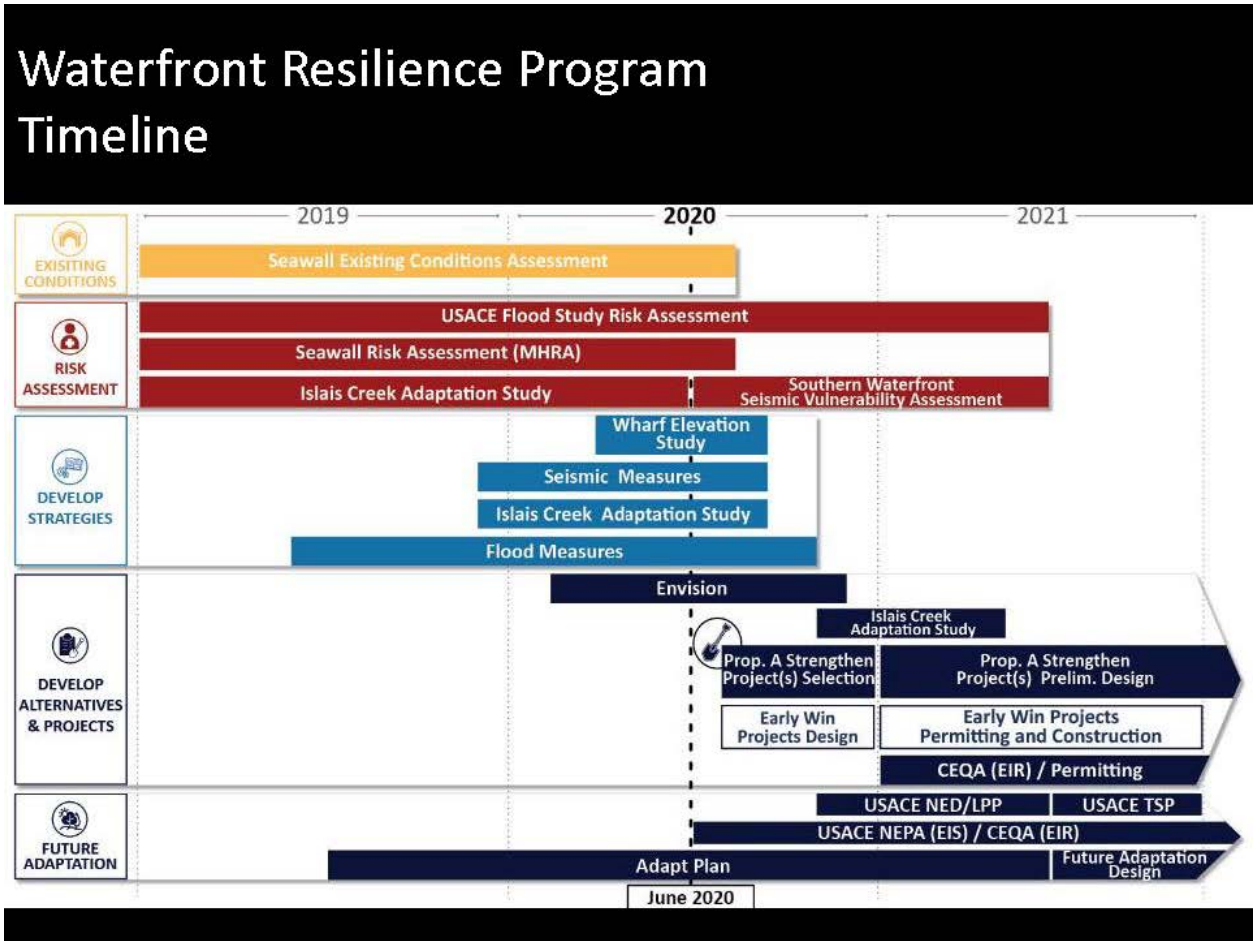
Timing: September 2018 to June 2021

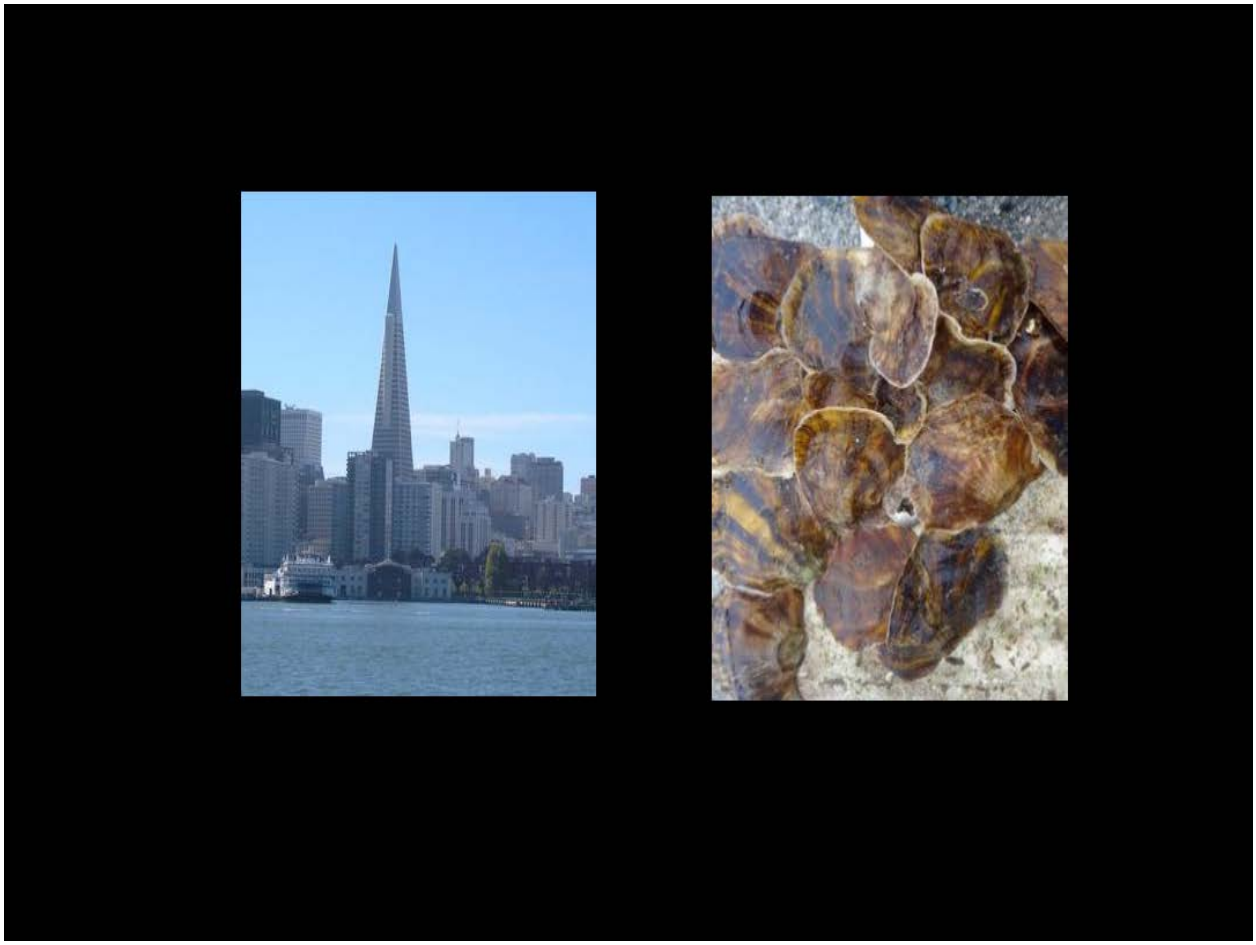
Focus: Flood risk to the federal interest from 2040 to 2090

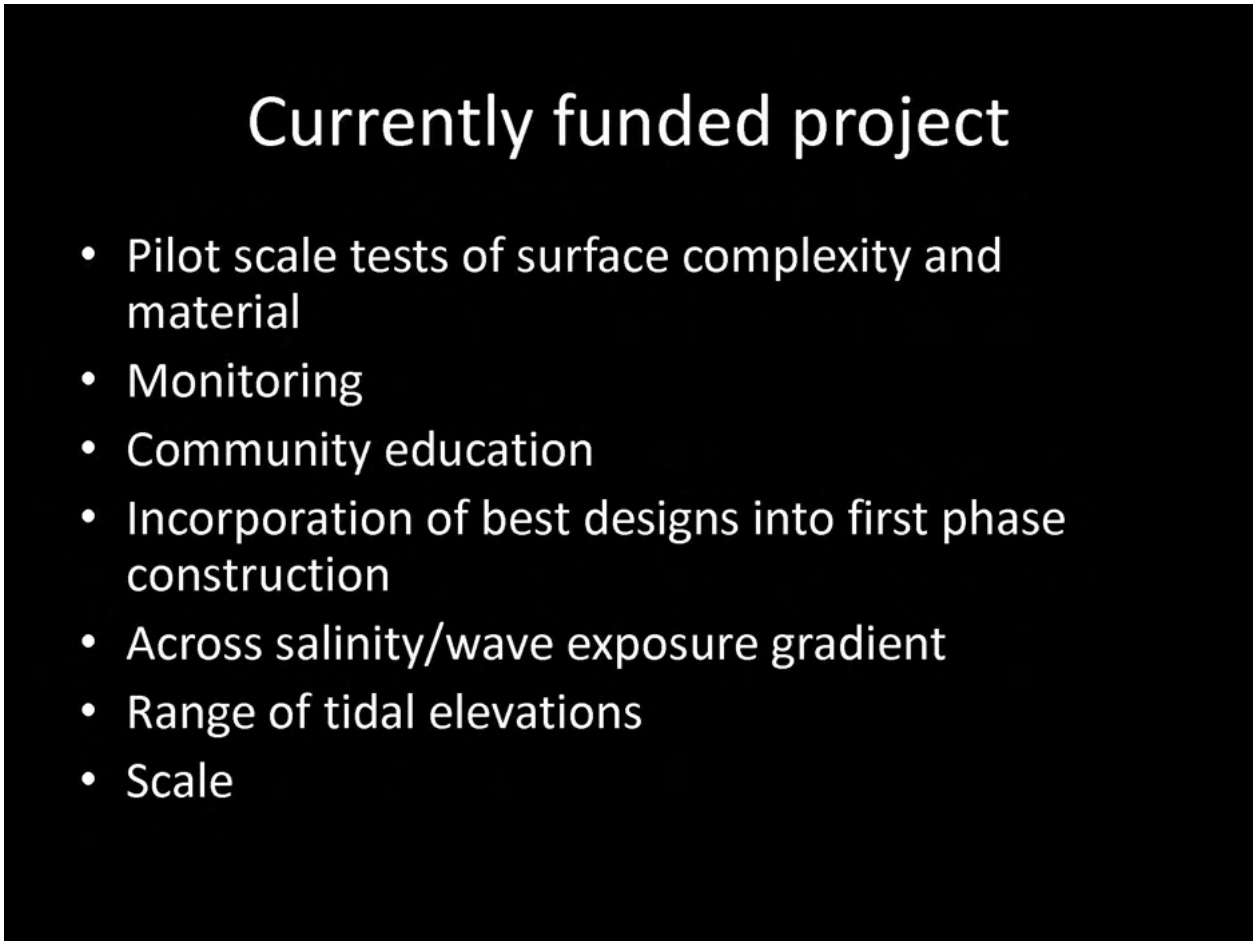
Funding: Port is the local sponsor. Recommendation to Congress expected in late 2023. If selected, design/construction of Federal plan cost shared 65% Fed / 35% local

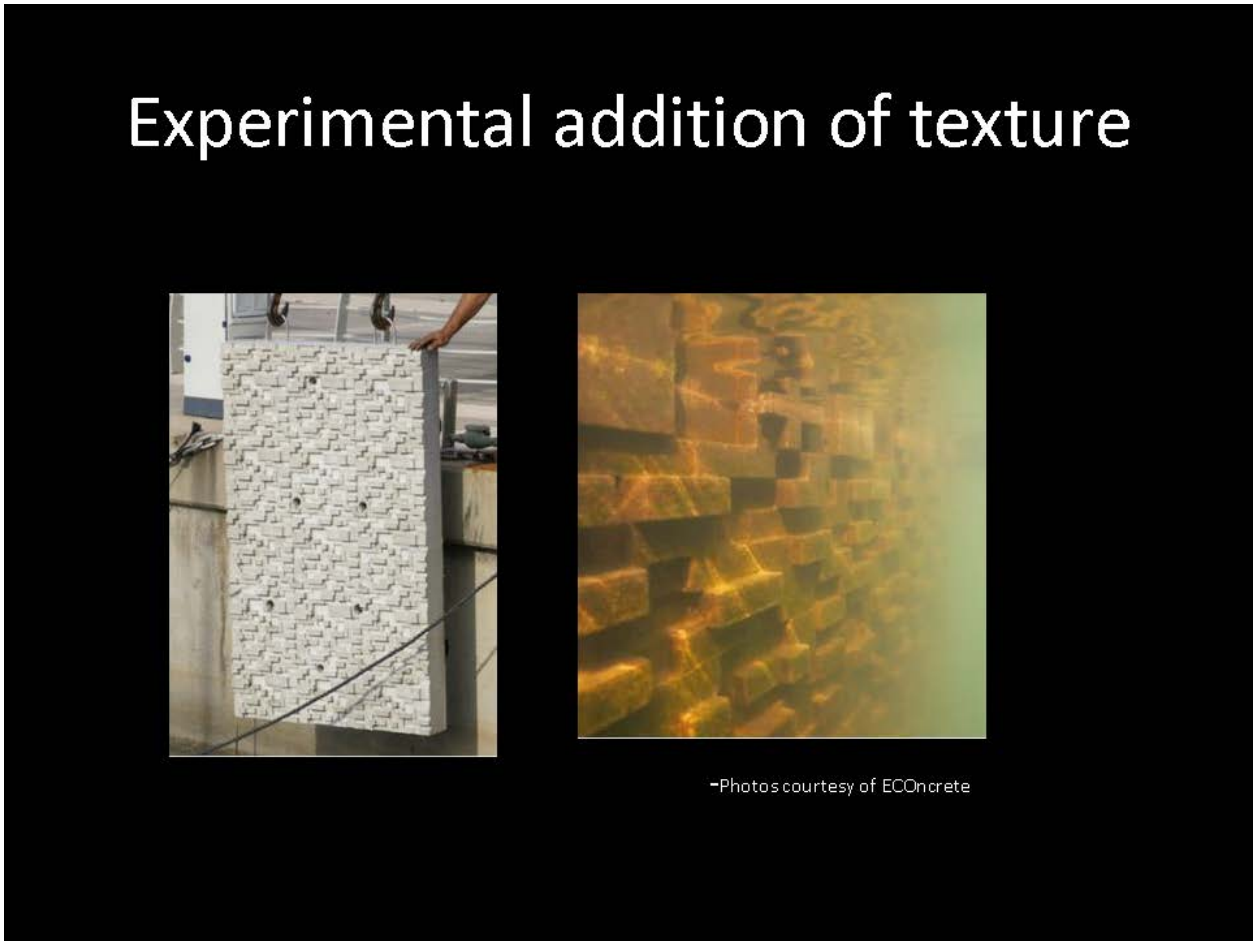
Waterfront Resilience Program
Community Engagement
WHAT DO YOU CARE ABOUT?
Open space and public space
Transportation, utilities and lifeline infrastructure
Emergency response and evacuation
Ferry Building
Bay and marine life
ARE THESE THE RIGHT GOALS?
Focus on public assets
Improve transit all along the waterfront
Provide adequate, equitable redevelopment of the Seawall
Include 500-year flood event for risk management
HOW SHOULD WE EVALUATE?
People first
Consider larger systems
Protect existing residents
Consider equity
Environmental opportunities
Prioritize economy


Waterfront Resilience Program
Ecological Seawall Pilot Project
Rincon Park
Pier 1
Exploratorium
Fisherman's Wharf
Islais Creek


Waterfront Resilience Program
Timeline
2019
2020
2021
EXISTING CONDITIONS
Seawall Existing Conditions Assessment
RISK ASSESSMENT
USACE Flood Study Risk Assessment
Seawall Risk Assessment (MHRA)
Islais Creek Adaptation Study
Southern Waterfront Seismic Vulnerability Assessment
DEVELOP STRATEGIES
Wharf Elevation Study
Seismic Measures
Islais Creek Adaptation Study
Flood Measures
DEVELOP ALTERNATIVES & PROJECTS
Envision
Islais Creek Adaptation Study
Prop. A Strengthen Project(s) Selection
Prop. A Strengthen Project(s) Prelim. Design
Early Win Projects Design
Early Win Projects Permitting and Construction
CEQA (EIR) / Permitting
FUTURE ADAPTATION
USACE NED/LPP
USACE TSP
USACE NEPA (EIS) / CEQA (EIR)
Adapt Plan
Future Adaptation Design
June 2020




Currently funded project
• Pilot scale tests of surface complexity and material
• Monitoring
• Community education
• Incorporation of best designs into first phase construction
• Across salinity/wave exposure gradient
• Range of tidal elevations
• Scale


Experimental addition of texture
-Photos courtesy of ECOncrete

Seeking funding for
• Options for integration of different shoreline types
-eelgrass habitat
-subtidal enhancements
• Options for community interactions
-constructed tidepools
-access points
-interpretation
• Longer term monitoring
• Longer term monitoring
• Further enhancements for crabs, fish, birds
• Transfer of lessons learned to larger seawall design

SLR solutions challenge us!
Protect people, businesses, infrastructure
Provide habitat for native species
Connect people to nature
Preserve a working waterfront
Address social inequities
Support innovation in green technology
Provide educational opportunities

MARIN CONSERVATION LEAGUE
Protecting Marin Since 1934

September 21st, 2020

Joanna Dixon
Project Manager
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903
Email: cortemaderacreek@marincounty.org

Re: Scoping Comments: Corte Madera Creek Flood Risk Management Project

Dear Ms. Dixon:

Marin Conservation League has only general comments to be considered as part of the environmental review of this project.

Frederick Allen Park. What would be the impacts to adjacent and nearby properties, if the proposed flood control and ecosystem measures are not implemented at Frederick Allen Park?

The proposed restoration of the park and channel to increase channel capacity and improve aquatic ecosystem habitat is a linchpin of the Flood Risk Management Project, but this work is still not fully agreed to by all parties. What back-up measures could be taken if the work is not implemented? The immediate area of the Park is densely developed on both sides of the channel - with businesses, recreational features, and homes that front on Sir Francis Drake Blvd that have rear property lines abutting the creek right-of-way. Some of the residential properties sit atop the concrete channel walls and some, upstream of the fish ladder, have backyards overhanging the open creek and supported by retaining walls in varying states of maintenance. What would be the flood risk to these properties if the Allen Park work is not done and are there fallback measures to protect these properties?

Overland Flow. Does the Project modeling and planning take into account the likelihood of greatly increased extreme storms and rainfall and how could these affect Project efficacy?

About 85 percent of the area drained by Corte Madera Creek and its tributaries is hilly and about two square miles of the valley are between mean sea level and elevation 50 feet above mean sea level, making many valley floor properties susceptible to overland flow from the surrounding watershed.

175 N. Redwood Dr., Ste. 135, San Rafael, CA 94903 | 415.485.6257 |
mcl@marinconservationleague.org

Marin Conservation League was founded in 1934 to preserve, protect and enhance the natural assets of Marin County.

Strip Erosion and Sediment Deposition. What effect if any would the proposed Project have on sediment accumulation in the concrete channel and downstream in the natural channel bed?

A 1989 Army Corps of Engineers (ACE) sediment analysis indicated that sediment flow, deposition, and increased channel roughness resulted in a flow capacity lower than planned for in the original design of the ACE project. Further, strip erosion along the channel alignment is extensive, contributing eroded material downstream that is deposited in the creek system's channel reaches. As a result, dredging in the concrete channel and downstream in the natural channel bed has been an ongoing need and cost.

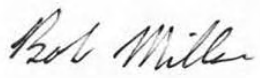
Kent Avenue. How do elements of the Project affect flood risk on Kent Avenue? Would the Granton Park floodwall or pump station – or any other aspect of the Project - affect, either increase or alleviate, flood risk along Kent Avenue, which runs parallel to the creek opposite to Granton Park.

Kent Avenue accumulates water that falls as rain and also water that flows down the street from the Town of Ross, including overland flows from Mount Baldy and water that originates upstream of Ross and cannot reenter the creek in Ross or Kentfield. As such, in past events it has been one of the most impacted neighborhoods.

Marin Conservation League appreciates efforts of the County, the funding agencies, and the Friends of Corte Madera Creek Watershed to address the flood risk challenges and ecosystem deficiencies that characterize the existing channel. We look forward to a completed project that benefits the community and improves fish passage and the creek ecosystem.

Thank you for this opportunity to comment.
We look forward to the Environmental Impact Report.

Yours truly,



Robert Miller
President

175 N. Redwood Dr., Ste. 135, San Rafael, CA 94903 | 415.485.6257 |
mcl@marinconservationleague.org

Marin Conservation League was founded in 1934 to preserve, protect and enhance the natural assets of Marin County.

From: Edi + Neil <edi-neil@dualent.com>
Sent: Tuesday, August 18, 2020 10:09 AM
To: cortemaderacreek@marincounty.org
Cc: 'Gilboy - Haven' <cherilyng@prodigy.net>
Subject: Corte Madera Creek Flood Risk Management Project - Comment re Proposed Storm Drain Pump Station

Dear Ms Dixon,

We presently reside at 1 Cedar Avenue, Kentfield, which is the residential property nearest the proposed Storm Drain Pump Station. Aside from the obvious construction and aesthetic issues, our concern, if any, is noise mitigation once the project is complete. We'd be very interested to know what noise, if any, may be associated with the ongoing operation of a pump station located at the foot of Laurel Avenue and adjacent to the creek.

Thank you,

Edi Alvarez and Neil Dukas

1 Cedar Avenue, Kentfield

edi-neil@dualent.com

Email Disclaimer: https://www.marincounty.org/main/disclaimers

FW: Corte Madera Creek Flood Risk Management Project
1 message

-----Original Message-----
From: Michael Wanger <vidkid@well.com>
Sent: Thursday, August 27, 2020 4:07 PM
To: cortemaderacreek@marincounty.org
Subject: Corte Madera Creek Flood Risk Management Project

I will be attending the Zoom Scoping Meeting, August 27, at 6 PM, and have some questions about the proposed project.

My property, 28 Locust Ave., is at the upstream end of Locust Avenue in Granton Park, and borders part of the proposed flood wall and pedestrian path..

1. Regarding the Granton Park Flood Wall, as indicated in Figure 01c, is the location of the upstream end of the wall accurate, or just an estimate?

2. Will the pedestrian path between (a) the Flood Control access at the end of Locust Avenue and (b) the Kentfield Hospital Bridge be preserved?

3. Regarding the Granton Park stormwater pump station, where will the water be pumped to?

Thank you,
Michael Wanger
28 Locust Avenue
Kentfield

Email Disclaimer: https://www.marincounty.org/main/disclaimers

FW: Corte Madera Creek Flood Risk Management Project

1 message

> On Aug 27, 2020, at 4:35 PM, Dixon, Joanna <JDixon@marincounty.org> wrote:
>
> Hello Michael,
> Thank you for listening and participating in the scoping meeting for the project tonight.
> To address your questions, at this time 1) the extent of the increased floodwall height at the upstream end along the Granton Park reach is just an estimate. The hydrology and modeling will need to be re-run as the design elements of the various alternatives are considered and the final

shapes and cross sections are developed and can then be reflected in the modeling work. 2)It is our intent to preserve the current informal pathway between the Granton Park neighborhood and the Kentfield Hospital bridge. 3) The granton park pump station will collect the water that drains from the street surfaces and storm drainage pipes within the granton park neighborhood and from runoff coming from Sir Francis Drake, and then pump it through the concrete wall and into Corte Madera Creek.
>
> I hope this information is helpful. Please feel free to contact me with any other questions as we move along through the project process.
> Thank you,
> Joanna Dixon
> Associate Civil Engineer
> Marin County Flood Control District
>
> -----Original Message-----
> From: Michael Wanger <vidkid@well.com>
> Sent: Thursday, August 27, 2020 4:07 PM
> To: Corte Madera Creek <cortemaderacreek@marincounty.org>
> Subject: Corte Madera Creek Flood Risk Management Project
>
> I will be attending the Zoom Scoping Meeting, August 27, at 6 PM, and have some questions about the proposed project.
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>
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>
> 2. Will the pedestrian path between (a) the Flood Control access at the end of Locust Avenue and (b) the Kentfield Hospital Bridge be preserved?
>
> 3. Regarding the Granton Park stormwater pump station, where will the water be pumped to?
>
> Thank you,
> Michael Wanger
> 28 Locust Avenue
> Kentfield
>
> Email Disclaimer: https://www.marincounty.org/main/disclaimers

Email Disclaimer: https://www.marincounty.org/main/disclaimers

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You're receiving this message because you're a member of the Corte Madera Creek group from County of Marin.

Leave group:
https://outlook.office365.com/owa/cortemaderacreek@marincounty.org/groupsubscription.ashx?source=EscalatedMessage&action=leave&GuestId=33a90849-7818-48f0-849e-84c3d5dfeec9

From: jeff abend <boxxorain@hotmail.com>
Sent: Thursday, September 3, 2020 10:55 AM
To: cortemaderacreek@marincounty.org
Subject: Stadium Way bike access.

Hi Joanna,

I was unable to tune in for the meeting on August 27th. about the concrete removal project at Stadium Way that is being proposed. My question is how will the bike path be impacted. I'm sure all involved realize what a critical artery this is for many people in the area. Will it be closed at all? Thanks

Jeff Abend

Email Disclaimer: https://www.marincounty.org/main/disclaimers

FW: Corte Madera Creek Flood Risk Management Project

1 message

-----Original Message-----
From: Michael Wanger <vidkid@well.com>
Sent: Wednesday, September 9, 2020 4:47 PM
To: Dixon, Joanna <JDixon@marincounty.org>
Subject: Re: Corte Madera Creek Flood Risk Management Project

Joanna,
Thank you for getting back to me in a timely manner prior to the Scoping Meeting August 27. I have another question.

Regarding the Lower College of Marin Concrete Channel Removal, the proposed conditions look like the foot path on the south side of the creek, which currently runs downstream from the Stadium Way footbridge, will not connect to the rest of the path as it does now. Will the path connect to the downstream section of the path? I really hope so as this is a major access way.

Thanks,
Michael Wanger

FW: Corte Madera Creek Flood Risk Management Project

1 message

-----Original Message-----
From: Dixon, Joanna <JDixon@marincounty.org>
Sent: Wednesday, September 9, 2020 8:47 PM
To: Michael Wanger <vidkid@well.com>
Cc: Corte Madera Creek <cortemaderacreek@marincounty.org> Subject: RE: Corte Madera Creek Flood Risk Management Project

Hi Michael,

The foot path on the College of Marin side/south side of the creek or right bank as you look downstream is currently an informal path. We have had a request from the College of Marin to maintain an informal pathway here on this side of the creek, which we may likely combine with a future maintenance access. The informal nature of the existing path is not planned to be improved into an official publicly accessible path.

I hope this information is helpful,
Thank you,
Joanna

-----Original Message-----
From: Michael Wanger <vidkid@well.com>
Sent: Wednesday, September 9, 2020 4:47 PM
To: Dixon, Joanna <JDixon@marincounty.org>
Subject: Re: Corte Madera Creek Flood Risk Management Project

Joanna,
Thank you for getting back to me in a timely manner prior to the Scoping Meeting August 27. I have another question.

Regarding the Lower College of Marin Concrete Channel Removal, the proposed conditions look like the foot path on the south side of the creek, which currently runs downstream from the Stadium Way footbridge, will not connect to the rest of the path as it does now. Will the path connect to the downstream section of the path? I really hope so as this is a major access way.

Thanks,
Michael Wanger

> Hello Michael,

CHARLES GOODMAN
20 Sylvan Lane
PO Box 1325
Ross, CA 94957
Phone 415-485-0911

September 14, 2020

Joanna Dixon, P.E.
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903

Dear Joanna,

There are several issues that need to be addressed in the EIR/EIS.

1. Hydrology: The County is using the Army Corps EIR/EIS Plan J Bypass as the basis for their own EIR/EIS. This is flawed because the County has left out all of the residents of Sylvan Lane and Shady Lane from hydraulics and hydrology.
2. Land Use, Planning: They have failed to account for any overload water flows from Bolinas Avenue, Fernhill, Southwood, Norwood, Ames or Lagunitas Road.
3. Hydrology: The EIR/EIS must address the significant impact on reducing the flow through Fred Allen Park, from supercritical flow to a 10-25year level of Flood Protection (per comment from Liz Lewis, at the July 9,2020 Ross Town Council Meeting). The number of 10-25year is baseless and has not been verified by the County.
4. Aesthetics: The County must address the removal of over 200 mature trees and how it plans to replace the Park Setting, Privacy, and Habitat Coverage in a timely manner.
5. Transportation, Noise, Hydrology: The County must address sediment removal. ("This study's uncalibrated sediment budget estimates that the Corte Madera Creek Watershed supplies about 7,250 tons of bedload each year to the reach above Ross. The calibrated Parker-Klingerman sediment transport model estimated average bedload sediment inflow at Ross is about 6,750 tons/year. Using an average of the two results, the study estimates that about 7,000 tons/year of bedload are delivered to Ross, or about 450 tons/sq. mi. /year.") Source: Geomorphic Assessment of the Corte Madera Creek Watershed, final report;

   FACT: To remove 7,000 sediment at 20 tons per truck = 350 trucks (loads). Load 6 trucks per hour, (1 every 10 minutes) equals 58 hours or over 7 works days for removal.

   How does the County plan to mitigate this substantial disruption of removing sediment from the Town?

Charles Goodman

Charles Goodman

Leslie and J. Bradley O'Connell
P.O. Box 653
Ross, CA 94957
tel: 415-459-9939
laoconnell@sbcglobal.net

15 September 2020

Marin County Flood Control and Water Conservation District
Joanna Dixon, P.E.
3501 Civic Center Drive, Suite 304
San Rafael, CA 94903

Re: Corte Madera Creek Flood Risk Management Project Phase 1:
Comments on the August 2020 Scoping Meeting for the proposed draft EIR

Dear Ms. Dixon:

We are submitting this comment in response to the August 27, 2020 Scoping Meeting for the proposed Corte Madera Creek Flood Risk Management Project Phase 1 Draft EIR. We reside at 15 Sir Francis Drake Blvd. We will be particularly impacted by several aspects of the project as currently proposed – including the removal of the concrete channel (which is likely to *reduce* flood protection for our home's location) and removal of foliage and other changes in connection with the proposed "riparian" corridor and redesign of Frederick Allen Park (which, among other impacts, would greatly diminish our privacy).

The purpose of the EIR is to assess environmental impact. Yet, in our view, the removal of the concrete channel in Ross, which has functioned well, will expose some homes on Sir Francis Drake, including ours, to the prospect of greater flooding. For those of us who will be adversely affected by the removal of the channel, it is important to know who will be responsible. Will the County be responsible for any damages resulting from flooding along Sir Francis Drake that retention of the concrete channel could have prevented or abated? Will the Town of Ross be responsible for such damages? In not, to what agency or institution will we be able to look for redress in the event that the project results in flooding which could have been prevented by retention of the current concrete channel?

There are also safety risks presented by increased access via Frederick Allen Park to rushing water, even if danger signs are posted. In addition to threats during periods of high water, there are year-round concerns for those of us whose homes will become more visible and vulnerable. In particular, in addition to eliminating habitat, the removal of the foliage between the creek and the homes on Sir Francis Drake will result in a grievous diminution of our privacy.

The suggested plan replaces a section of the concrete channel – which functioned properly during our 100-year storms – with an untested widened Frederick Allen Park. I have little confidence in the County's models as to the reduction in flooding. I note that the County has changed its models in the past in the course of its advocacy of this project – for example, in connection with

the impact of the San Anselmo phase on its residents.

The model does nothing to address the flooding caused by overland or runoff water. It is acknowledged as a problem in the previous EIR draft, but no specific approaches were suggested. Additionally, the FAP flood wall design has not taken into account the possible introduction of increased flooding caused by overland water or creek overflow water trapped behind the walls.

While the project ostensibly is intended to help protect fish, the County's plan will strip out mature trees providing not only shade (which the project offers to remedy through structures), but also moisture, affecting the greater ecosystem necessary for the fish and other species dependent on these trees. This plan might conceivably provide some help in a 10-year or 25-year event, but would introduce the possibility of greater harm during floods, greater harm to fish and trees, and the certainty of greater risk throughout the year for those of us whose families and homes become more vulnerable.

Thank you considering public comments.

Respectfully,

Leslie and J. Bradley O'Connell

FW: EIR Comment Corte Madera Creek

1 message

From: Garril Page <obility@comcast.net>
Sent: Friday, September 18, 2020 10:00 AM
To: cortemaderacreek@marincounty.org
Cc: Lewis, Liz <lizlewis@marincounty.org>
Subject: EIR Comment Corte Madera Creek

September 18, 2020

To Whom It May Concern:

I appreciate the opportunity to comment on the foundation EIR/EIS as it relates to the current EIR, and to submit subsequent, specifically-focused comments developed during the August 27, 2020, Scoping Session and presentations of June 25 and 30, 2020.

Comment on EIR/EIS Relevance

The scoping meetings of 2015-2016 identified the following issues associated with **Alt J**, the Tentatively Selected Plan (**TSP**) without bypasses:

USACE OCT 2018 EIR/EIS, ES-8:

Areas of Controversy

1. Community perception of floodwalls on private property...

3. Potential vegetation removals for for floodwalls per USACE guidelines...

5. Increased flood risk downstream of project sites.

6. Adequate passage and habitat for enhances fish species.

The above remained as Areas of Controversy in public meetings held June 25 and June 30, 2020, and in the scoping session held August 27, 2020.

Added to the above list should be the selection of **Public Access and Recreational Quality** as one of the six Project Objectives. What is the justification for this addition except to capture the DWR grant to finance downstream project elements? It is an objective that appears not widely shared, an area of controversy.

What opportunity has the public to comment on the need for the project to be **Fiscally Responsible** per the list of six Project Objectives? If an EIR will not include consideration of fiscal issues, then fiscal responsibility is not relevant to solicitation of public commentary for that EIR. Why was this irrelevant Fiscally Responsible project objective made part of the August 27, 2020 scoping session and repeated in the Project Information Sheet on the County's website?

USACE OCT 2018 EIR/EIS, ES-8:

Unresolved Issues

Refinements to TSP...: relocation of sanitary sewer line which intersects with the fish ladder and Allen Park Riparian Corridor ... pump stations are not in the cost estimate and the project team has not performed an interior drainage analyses to determine of there is need.

Floodwall Heights of the TSP: USACE has not completed a Risk and Uncertainty Analysis to determine exact heights of floodwalls… some vegetation removal within the creek channel may be needed within Unit 4…;

Vegetation Variance along Floodwalls: … assuming a 15-foot buffer… A risk analysis will be performed for Corte Madera Creek…This will determine to what extent riparian vegetation could be restored at Frederick Allen Park Riparian Corridor within 15 feet of floodwalls.

These above sections of the OCT 2018 EIR/EIS **Alt J** remain unaddressed. Panorama Environmental Inc. should address these publicly-stated concerns and unresolved issues, not continue to kick this can down the road. I, for one, am tired of playing games introduced by revolving consultants.

Confusion is created by the discrepancies between the online instruction and the information in the scoping meeting. Susanne Heim of Panorama Environmental Inc. stated alternatives presented in scoping session would be included in consideration.

But, reading the presentation, one is led to believe comment is limited to this county-selected FAP Riparian Corridor Project only. [see Minute 15:21of August 27, 2020, Scoping Presentation.]

By relegating comment on the merits of the project to some future and undisclosed forum, by failing to consider merits or contents of the Project, and by limiting comments to this county-selected Project only, "consultation with the public" is truncated. Public participation is manipulated using restrictions of the EIR process.

Disabling the chatbox feature in the August 27, 2020, scoping session was overly restrictive and hampered the flow of information, put a damper on participation.

The Access Ramp in the vicinity of the Kentfield Pump Station was indicated in the icons, but not depicted in Figure 01c [Minute 6:44] in the Presentation nor included in Project Elements discussion. Where is information on the proposed Access Ramp? Has the ramp been deleted from consideration?

Comments Limited to Scope of the Environmental Effects:

Aesthetics

Ross' essence and character are defined by the high canopy of its majestic heritage trees. The proposed Frederick Allen Park (FAP) Riparian Corridor as proposed is barren, stark, denuded of natural beauty, and very inhospitable. The proposed man-made shade structures are not in keeping with any aspect of the town, and appear to be poor substitutes for the trees that would be removed. The shade structures provide relatively little shade for humans, none for fish in the basin, and are not appropriate, welcoming, nor attractive to gaze upon.

Tree loss creates emphasizes the proximity of Sir Francis Drakes traffic. This becomes visual pollution for Ross Common. The intrusion will be particularly notable within the proposed FAP Riparian Corridor.

Alternative suggested: Removal of Fish Ladder Only.

Agriculture and Forestry Resources

Ross is distinguished by its trees: the high canopy overlays the town, creating a unique character immediately evident on entering Ross' shaded streets. FAP is Ross' urban forest, adjacent to a major arterial, yet a peaceful and relatively serene oasis on even the hottest days.

All along the creeks and roads, Ross' trees reduce pollution, store carbon, help control storm water, reduce noise and raise property values. Trees promote biodiversity: plants, birds, insects, small animals and microscopic soil dwellers thrive under the tree canopy. Root systems of mature alders and willows in creek bank toes and along walls create stability. The native oaks and redwoods resist wildfire and provide shade and cool water for creeks. These attributes exist; they must be valued proportionately and weighed against the odds of an improbable return of endangered, extirpated coho, the small number of observed migratory salmon and trout, the ecological disturbances resulting from the FAP proposal's expanded development and habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition and lessened quality of life for residents.

Sacrificing the perceived peace and privacy created by existing trees exposes the town to a major traffic arterial, Sir Francis Drake, and is detrimental to Ross environment.

Alternative Suggested: Fish Ladder Only. Preserve the mature alders lining the creekbed.

Biological Resources

Ross public life centers around the Post Office, The Common, Ross School, and the commercial area. If the FAP Riparian Corridor Project creates pools of still water, bats and other insect-eaters become an even more important resource. Residences along Ross' creeks benefit from bats and insect predators. The proposed extent and duration of the FAP Riparian Corridor project will result in disturbance of roosts and habitat, and adversely affect enjoyment of exterior areas throughout Ross. Wildlife displaced by the project may never return to the denuded habitat.

Alternative suggested: Fish Ladder Only has smaller scope, shorter construction period, less potential harm and disruption while providing comparable protection.

Cultural Resources,

Tribal Cultural Resources

I combine these two headings as I have commented extensively on these subjects in prior EIR, and EIR/EIS opportunities. Having been told the USACE and County have collected such materials for inclusion in the current EIR, I herewith incorporate those Comments by reference. If, in fact, the current consultants have found and read my prior Comments, they have been advised regarding historical, cultural and tribal resources in Ross from 1960-2018.

I assume the Town of Ross has mentioned relevant reports and resources for which Ross has contracted separately.

I will add that the FAP Riparian Corridor proposes excavation and land disturbance in areas of early tribal settlements. The Project lead agency must exercise extreme diligence in honoring artifacts uncovered in the project area.

Alternative suggested: Fish Ladder only takes place within prior disturbed area.

Geology and Soils

The proposed FAP Riparian Corridor lies within a watershed remarkable for the quantity of sediment shed into its waterways. Prior projects repeatedly miscalculated the effects of erosion and aggregation, and failed to comprehend the effects of these elements. Dysfunction results. This is history best NOT repeated.

Marin's Countywide Plan is a resource: maps and geological reports as well as data collected during annual creek maintenance and dredging should be part of this EIR.

Alternative suggested: fish ladder only affects a smaller area where some reinforcement and stabilization have been installed.

Hazards and Hazardous Materials

Floodwalls, retaining walls and grade control structures create potential entrapment for those behind proposed new and modified walls. If flows outflank these structures, hazardous conditions result. The selected project should correct, not create, risk.

The proposed side path, and steps to the creek invite access by the public. This creates dangerous conditions for unsuspecting people unaware that flows in the project area are forceful enough to transport an 18-inch boulder past the College of Marin into the downstream, natural channel. The unwary are not afraid of the creek: a Kentfield resident drowned in the channel. During flood conditions, small watercraft and surfboards are in use along Berens Drive and at the Bon Air Center.

Enhancing fish habitat should not invite incompatible human recreational activities.

A realigned multi-use pathway encourages speeding bikes that endanger pedestrians, small children and pets enjoying walks along the path.

Excessive tree removal proposed for FAP Riparian Corridor creates ecological disturbances, expanded development, habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition where planned riparian growth may be more susceptible to wildfire.

Adding 11 -17 new larger fish resting pools to the channel bottom has unknown effect on the existing concrete structure's stability and safety.

The Oct 2018 EIR/IS predicted increased flooding downstream of Ross and specifically in the College of Marin area. By removing the channel walls in the lower Unit 2 channel, approximately the areas extending from Stations 332+00 to 320+00, increases the potential for toxic waste entering the natural creek habitat. The College of Marin's dumping facility, *a.k.a.* trash transfer station, has been a source of protest and concern. The facility is wrapped

within the channel's curve. Lowering walls, and widening banks destabilizes existing conditions and increases potential encroachment of flood waters into this COM facility.

The cumulative effect of removing San Anselmo's Azalea, Madrone, Nokomis, Center/ Sycamore and Ross' Winship bridges, plus removal of the fish ladder constraint, is to increase downstream flood flows. This increases potential flooding at the trash transfer station, spilling toxic waste into the surrounding habitat.

The EIR/EIS states Alt J induces more frequent flooding at the College of Marin per Appendix A sections 7.1,7.5.6, 8.2, 9.1 and in Areas of Controversy #5 above.

Hydrology and Water quality

The proposed sediment basin for FAP is needlessly disruptive, depends on massive excavation for function. The concept: dig the biggest possible hole, fill with water.

The proposed FAP Riparian Corridor lies within a watershed unique due to the quantity of sediment shed into its waterways. Prior projects repeatedly have miscalculated the effects of erosion and aggregation, and also have used incorrect, challenged Mannings 'n' values with resultant flawed concepts, dysfunction, and failed performance.

Concepts rendered infeasible due the channel's existing slope constraints, sinuosity, lack of freeboard, steepness and elevation restrictions now further complicated by rising tidal influence, must be part of this EIR.

Partial consideration wherein only certain aspects and areas of the channel are included in studies and reports ensures continued failure: Winship Bridge to Lagunitas Bridge must be included the proposed project.

Replacing the V-shaped bottom that directs sediment to the channel's center seems a better alternative than a flat-bottomed, slow-flowing basin that traps sediment. The hope that cobbles and fine sediment can form a more natural creek bottom for fish is unrealistic in a channel grossly affected by sediment dynamics, where flood events historically are varied and diverse. I think it is far more likely that the planned low-'n' value plants will be swept away, creating greater maintenance and expense for both Ross and the downstream areas receiving the detritus. Unstable, choked, silted areas do not provide good fish habitat.

A v-shaped channel has the potential for chutes, falls, pools and plunges with quieter flows along the channel slides. This appears to be an appropriate concept that enables both fish passage and flood protection.

Adding 11 -17 new larger fish resting pools to the channel bottom has unknown effect on flow, sediment transport and sedimentation. Since formulas used to model proposals are limited by data uncertainty, odds of selecting correct assumption(s) essential to determining the appropriate computer programming lessen exponentially with additional unquantified designs.

The new larger fish resting pools in the channel bottom creates unknown effect on the existing concrete structure's stability, coefficient of roughness, profile at the time of any given flood event. Therefore, reliable, accurate predictions of potential turbulence and other hydraulic effects become less likely.

The EIR/EIS states Alt J induces more frequent flooding downstream of Ross at, for example, the College of Marin *per* Appendix A sections 7.1,7.5.6, 8.2, 9.1 and in Areas of Controversy #5 above. Induced flooding is a significant adverse consequence, an added risk, and must be identified as such.

The design for the Access Ramp is listed as complete, but plans for the proposed structure are hard to find. What will be done to ensure the Access Ramp does not allow water to escape from the channel back into Granton Park? What prevents flows trapped by the ramp from increasing Granton Park flooding?

Suggested Alternative: Fish ladder removal only. More transparency and response to public concerns over function; answers to questions and concerns raised over hydrology and hydraulics, performance of concepts. The process to date has not inspired confidence.

Noise

No one in Ross welcomes the noise of Sir Francis Drake Blvd. The FAP Riparian Corridor results in permanent, increased noise intrusion from SFD throughout a large portion of Ross.

The longer construction period of FAP Riparian Corridor means extended, expanded exposure to all aspects of construction noise.

Air Quality

No one in Ross welcomes the toxic traffic fumes of Sir Francis Drake Blvd. The FAP Riparian Corridor results in increased air pollution from SFD and diminished air quality for at least 10 years, probably longer, until proposed trees mature. Deciduous trees will be less effective in removing toxic fumes. and improving air quality.

The longer construction period of FAP Riparian Corridor means extended, expanded exposure to all aspects of construction-caused air pollution.

Recreation

Transportation

Biking has become more and more popular form of recreation and for some people, of transportation. Unfortunately, the increase in popularity has meant increases in heedless behavior, traffic violations and increased speed that endangers pedestrians. Upgrading the multi-use path encourages greater use and abuse, requires more regulation, increased supervision, and added demands on Town staff and services as well as less privacy for town residents.

The lengthy period of construction for the FAP Riparian corridor increases traffic disruption and inconvenience for Ross residents and drivers on SFD.

Suggested Alternative: smaller project. Looking at the June 30 breakout of 25-year Event Flood Depth Change Map of inches saved per proposal, the Fish Ladder Only wins the Common Sense award.

Conclusion

The proposed FAP Riparian Corridor is maximum disruption for minimal gain.

The county cannot capture DWR funds if Ross refuses design approval or balks at granting the easement. The Ross Council repeatedly has requested a more moderate alternative and increased information. It is time to honor their requests.

After 48 years, and approximately the same amount in millions of dollars wasted, accountability is due. It is time to provide an honest assessment of project performance for Units 4,3,2,1. People who pay taxes and flood fees are weary of force-fed, piecemeal projects and undeveloped, ill-defined concepts.

Thank you for considering the above comments.

Sincerely,

Garril Page

FW: Subject: Corte Madera Creek Flood Risk Management Project, Phase I | Scoping Comments

1 message

From: Hobart, Samantha <Samantha.Hobart@morganstanley.com>
Sent: Friday, September 18, 2020 3:30 PM
To: cortemaderacreek@marincounty.org
Subject: Subject: Corte Madera Creek Flood Risk Management Project, Phase I | Scoping Comments

To Joanna Dixon:

c/o Joanna Dixon, P.E.,

3501 Civic Center Drive, Suite 304, San Rafael, CA 94903

Please include my below comments and concerns addressing the Corte Madera Creek Flood Risk Management Project.

Thank you and enjoy your weekend.

1. **Transparency among property owners:** To protect the residents, please advise each property owner where the flood elevations are before and after any creek work is completed. This should be a transparent side-by-side and simple-to-understand method not buried in a 700 page document. In addition, all property owners need to be addressed and able to discuss the changes to their properties and not only a select few property owners as we have seen happen with the San Anselmo Flood Risk Reduction Project.
2. **Fish Ladder Only Alternative**: Please require the Flood District provide a Fish Ladder removal-only alternative. The removal of the fish ladder provides the only benefit to flood risk reduction and other projects such as Frederick Allen Park should not be added since it does not provide flood benefit. The addition of Fredrick Allen Park is not a benefit to the residents of Ross and is an added and unnecessary expense.
3. **Mature Trees:** The town of Ross has a long history of arbor preservation and for good reason especially along creeks.

The rootsystems of the mature trees in Frederick Allen Park are an integral part of flood prevention and protection. Removing these trees and their rootsytems will cause significant damage and increased risk to flooding and the erosion.

Samantha Hobart

78 Sir Francis Drake

Ross, CA 94957

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Email Disclaimer: https://www.marincounty.org/main/disclaimers

FW: Comments for Corte Madera Creek Flood Risk Management Project EIR

1 message

From: Doug Ryan <dougryan999@gmail.com>
Sent: Sunday, September 20, 2020 9:54 PM
To: cortemaderacreek@marincounty.org; jdixon@marincounty.org
Subject: Comments for Corte Madera Creek Flood Risk Management Project EIR

September 20, 2020

Joanne Dixon PE

Re: Corte Madera Creek Flood Risk Management project Environmental Impact Report

I wanted to pass along my comments.

Mitigation. If any mitigation is required, will it be done at the County's expense, or will the County at the last minute (after the draft eir, before the final eir, as was done with the san anselmo flood control project) introduce the novel concept of "proportionality" to try to offload the cost of preventing flooding on a homeowner's house to the homeowner, even though it is actions taken by the County that would be causing the flooding?

What does the model being used show as the water level before the san anselmo creek project and after? My home, at 74 Sir Francis Drake Blvd in Ross, shows increased flood levels. Do theirs?

Does the impact of the Winship Bridge replacement (increase of four inches of water at my house) have a similar effect on the houses downstream in the scope of this project? How is this accounted for?

Why is so-called beautification being included as part of a flood control project? It is clear to even the most dimwitted among us that resources are scarce and should be focused on FLOOD CONTROL and nothing else. Is this a ploy to get Town of Ross approval? One of the options that should be laid forth is removal of the fish ladder and NOTHING ELSE. how much would that cost? What does the beautification project do to reduce flooding? Anything? This has been requested several times and the County has deliberately chosen to ignore this alternative. Why?

I find the efforts to date to be wholly unsatisfactory. I am very concerned that the project will change and morph until magically no homeowners receive the required necessary remediation. That would be totally in keeping with the San Anselmo Flood Control Project.

What is the benefit to cutting down 200 mature trees? If a homeowner attempted this, the County would be the first ones attacking.

Please confirm receipt of this email and acknowledge it as timely submitted.

Doug Ryan

74 Sir Francis Drake Blvd Ross CA 94957

mail: Po box 1151 Ross CA 94957

415.297.8402

PANORAMA
ENVIRONMENTAL, INC.

MEMORANDUM

Date: August 27, 2020

To: CMC Project Team

From: Panorama Environmental, Inc.

Subject: August 27 Scoping Meeting, Public Comments

Table 1 Oral Comments (Not verbatim)

No.	Name	Time	Question
1	Pam	6:19 PM	Will cement between College of Marin and Ross be dismembered? Will there be a natural channel to cement then natural channel
2	John Crane	6:20 PM	What percentage of the budget is allocated for Frederick Allen Park vs. flood prevention?
3	Barbara Salzman	6:21 PM	Will this presentation be available on the project website? Answered – yes. I think this is a great project, and I think getting rid of the concrete wall would be an incredible benefit. Surprised about steps down to the creek. Do not like the idea of creek access. Not clear where that will be. Increases county liability and it isn't good for the resources.
4	Samantha Hobart	6:21 PM	My home is directly impacted by the San Anselmo Flood Risk Reduction Project. Concerned for the people impacted by the Corte Madera Creek FRM project. EIR for San Anselmo project and neighbors affected changed greatly. Concerns if EIR will be abided by and concerned mitigation measures will be changed after the fact. Guidelines of first finished floor as a measure. Require a 1-foot margin of floor if District wishes to use first finished floor as a measure. Requests measure reflects first finished floor less 1-foot to protect the residents. Residents noticed as part of EIR continue to receive mitigation measures and measures are not changed after the EIR.
5	Nicholas Salcedo	6:25 PM	One of the project objectives should be to remove as much concrete as possible, raising of the concrete wall seems to be in conflict with that. Would like to see an alt that uses as much natural material, boulders and woody debris, as possible. Would like to see an alt. that would minimize the need and height of the walls. Locate on outside edge of easement and construct of wood to minimize need for additional concrete.

717 Market Street, Suite 650 San Francisco, CA 94103 650-373-1200
www.panoramaenv.com

MEMORANDUM

August 27, 2020
Page 2

No.	Name	Time	Question
6	Elizabeth Robbins	6:26 PM	Wonder why you haven't looked into the possibility of just removal of the fish ladder. Several council members requested that we look at that option. Removing the flood ladder would be relatively inexpensive, the whole project is very expensive. Safety is a big problem with this project. Don't want people going into the creek during a storm. Dangerous creek when there is a lot of rain. Concerned about steps down to creek and not fencing off water. Puts people up close to rapidly flowing water Where does the Town of Ross come in. How can they discuss it. Didn't see any listing for present project to Town of Ross and Town Council.
7	Leslie	6:29 PM	No mention of the over ground water and how that will be dealt with. The whole modeling has been so inconsistent as seen with the San Anselmo area, could be inaccurate. If you cause more flooding, who will be responsible?
8	GGP- Garyl Paige	6:30 PM	Environmental list of what will be analyzed does not include function, all environmental goals are based on conceptual design and not quantified. Concerned about hydraulics. When you have larger fish resting pools changes the way the water and the sediment moves in the channel. Concerned about hydraulics and design of the project. Where there are new flood walls, potential to trap people behind those walls with flood waters. Liability potentially increased by people being close to the creek. In the watershed there is local drainage and a large source of flooding in Ross. Not considering the watershed, because not considering any local drainage. Would like to see some specifics, what is the regrading of the fish ladder. How much regrading. Regrading affects the function, the function affects the hydraulics and the hydraulics affects the results.
9	Julie McMillan	6:33 PM	Would like to look into the alternative of removing just the fish ladder. If Frederick Allen Park is used as a flood plain, many trees will be removed, will be bad aesthetically and expensive to add replacement trees
10	Charlie	6:34 PM	Want to look at removal of fish ladder alternative. County has made this a piecemeal project from Fairfax, San Anselmo, Ross, and Kentfield. Concerned about area between Sir Francis Drake and Lagunitas Bridge – left out of project. Live at confluence of Corte Madera Creek and Ross Creek and don't agree with the calculations of volume coming out of the creek – new Lagunitas Bridge will not handle that water. Water comes out at Lagunitas and Sylvan Lane and will flood all houses on Poplar. Homes not protected by project. Continually will not address the interior drainage that has no way of getting back into the concrete channel.

No.	Name	Time	Question
11	Pam	6:38 PM	Live in unincorporated area. Fish ladder has always been an issue. Wish her son had blown up fish ladder. She is in the cement area and hopes that the proejct will not remove fences at the back of the property so that people do not get pulled in during a flood. Waters were very rapid and all the way to the top of the channel during last flood. If someone falls in they will be dead – too fast moving and rapid water. Putting in a pump. Last flood – College Court really affected. Homeowner would do something prior to flooding to get prepared. Doesn't know if this is what the pumping station will be. College Court has some sort of a device and gets drastically hit. Ross has sewer system in the streets. Stops at Ross border. Good to have some sort of drainage under Kent Avenue to flow water out. Drain that opens up. If redoing plumbing on Kent Avenue, include that.
12	Charlie	6:43 PM	Talk about sediment dynamics, want an explanation of what sediment dynamics consists of.
13	Samantha Hobart	6:45 PM	Can you read Jenny Mota's comment outloud? (Read out loud)
14	Leslie	6:48 PM	Please explain what reduced footprint means.
15	John Crane	6:58 PM	Is there a way to respond to comments? Very off putting, feels deliberate.
16	Barbara Salzman	6:59 PM	Typical scoping process, everyone's comments will be addressed in the EIR. Does not like that you can't see what comments people have typed in the zoom platform.
17	Charlie	7:00 PM	Is there a way to find out how many people are attending?
18	Pam	7:01 PM	Very happy that everyone is attending, are these comments going to be in the EIR report?
19	Leslie	7:10 PM	Why did the Army Corps of Engineers pull out of the project last time, and why are they not interested in participating this time?
20	Leslie	7:38	During the last project proposal, even if the plan was approved, the town would still have the ability to say no. At what point during this process does the town loose the power to say no?
21	John Crane	7:40 PM	Who are you, and how are you being compensated?

Table 2 Written Comments

No.	Name	Time	Question
1	Leslie	6:20 PM	What is meant by "reduced footprint in Frederick Allen Park"?

MEMORANDUM

August 27, 2020
Page 4

No.	Name	Time	Question
2	Richard Gumbiner	06:21 PM	Will public be notified prior to completion of the EIR of the proposed trees slated for removal in each segment of the project , and will replacement trees be identified at that point?
3	martaosterloh	06:28 PM	What are the plans for recreation opportunity?
4	Jenny Mota	06:33 PM	Hello, I am Jennifer Mota and I live at 82 Sir Francis Drake Blvd., Ross CA. I would like to second everything Samantha Hobart just spoke about. I also urge residents who live along this track to please stay informed and to make sure if plans or aspects of the project change that they are well aware. I have been told mitigation would be provided and now being told my home will receive no mitigation even though water levels will be increasing at my residence becuase of the San Anselmo Flood Risk Reduction Project. Modeling seems to be inaccurate and/or changing and people need to be aware there could be changes that may impact them negatively. Thank You. Could you please read this out loud, my computer audio is not working!
5	Jenny Mota	06:38 PM	Could you please read my comment? my computer audio isn't working
6	Jenny Mote	6:42 PM	I would also like to ask… It mitigation measures change after the Draft and Final EIR are finalized and accepted could you explain why this would happen or why this is ok?
7	Peter Hogg	06:43 PM	Is there a risk of losing grant funds if you do not proceed with this project

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Attachment A Scoping Meeting Attendee Report

Attendee Report

Report Ger	8/27/2020 20:02							
Topic	Webinar ID	Actual Start Time	Actual Duration (minutes)	# Registered	# Cancelled	Unique Vie	Total Users	Max Concurrent Views
Public Scoj	856 5876 3657	8/27/2020 17:22	158	37	0	37	52	35

Host Details

Attended	User Name (Original Name)	Email	Join Time	Leave Time	Time in Session (minutes)	Country/Region Name
Yes	Kathleen Cuschieri (Panorama Environmental)	admin@panoramaenv.com	8/27/2020 17:22	8/27/2020 19:59	158	United States of America

Panelist Details

Attended	User Name (Original Name)	Email	Join Time	Leave Time	Time in Session (minutes)	Country/Region Name
Yes	Patrick Streeter	pstreeter@townofross.org	8/27/2020 18:02	8/27/2020 19:59	117	United States of America
Yes	Joe Chinn	jchinn@townofross.org	8/27/2020 18:01	8/27/2020 19:16	75	United States of America
Yes	Tonya Redfield	tonya.redfield@ghd.com	8/27/2020 17:50	8/27/2020 17:53	4	United States of America
Yes	Tonya Redfield	tonya.redfield@ghd.com	8/27/2020 17:55	8/27/2020 19:06	71	United States of America
Yes	Raymond Wong (Susanne Heim)	susanne.heim@panoramaenv.com	8/27/2020 17:26	8/27/2020 19:59	154	United States of America
Yes	Liz Lewis (Susanne Heim)	susanne.heim@panoramaenv.com	8/27/2020 17:27	8/27/2020 19:59	153	United States of America
Yes	Joanna Dixon (Susanne Heim)	susanne.heim@panoramaenv.com	8/27/2020 17:28	8/27/2020 19:59	152	United States of America
Yes	Susanne Heim	susanne.heim@panoramaenv.com	8/27/2020 17:29	8/27/2020 19:59	151	United States of America
Yes	Richard Simonitch (Susanne Heim)	susanne.heim@panoramaenv.com	8/27/2020 17:31	8/27/2020 17:36	6	United States of America
Yes	Susanne Heim	susanne.heim@panoramaenv.com	8/27/2020 17:43	8/27/2020 17:47	4	United States of America
Yes	Susanne Heim	susanne.heim@panoramaenv.com	8/27/2020 17:54	8/27/2020 17:55	2	United States of America
Yes	Richard Simonitch (Susanne Heim)	susanne.heim@panoramaenv.com	8/27/2020 17:56	8/27/2020 19:59	124	United States of America

Attendee Details

Attended	User Name (Original Name)	First Name	Last Name	Email	Registration Time	Approval S	Join Time	Leave Time	Time in Se	Country/Region Name
Yes	John Crane	John	Crane	john@johncranefilms.com	8/27/2020 18:01	approved	8/27/2020 18:01	8/27/2020 19:14	74	United States of America
Yes	John Crane	John	Crane	john@johncranefilms.com			8/27/2020 19:37	8/27/2020 19:44	7	United States of America
Yes	Beach Kohl	Beach	Kohl	beachkuhl35@gmail.com	8/27/2020 17:54	approved	8/27/2020 17:56	8/27/2020 18:51	55	United States of America
Yes	Anne Petersen	Anne	Petersen	annepetersen129@gmail.com	8/27/2020 18:35	approved	8/27/2020 18:35	8/27/2020 19:59	85	United States of America
Yes	Bjorn Griepenburg	Bjorn	Griepenburg	bjorn@marinbike.org	8/27/2020 18:09	approved	8/27/2020 18:09	8/27/2020 18:38	29	United States of America
Yes	Tilda	Tilda		wthomp139@aol.com	8/27/2020 17:59	approved	8/27/2020 17:59	8/27/2020 18:52	54	United States of America
Yes	Pam	Pam		pamdonahuegrant@hotmail.com	8/27/2020 18:01	approved	8/27/2020 18:01	8/27/2020 19:55	115	United States of America
Yes	susan Stompe	susan	Stompe	ssstompe@aol.com	8/27/2020 18:06	approved	8/27/2020 18:06	8/27/2020 19:03	58	United States of America
Yes	martaosterloh	martaosterloh		martaosterloh@comcast.net	8/27/2020 18:01	approved	8/27/2020 18:01	8/27/2020 18:42	41	United States of America
Yes	samanthahobart	samanthahobart		samanthahobart@gmail.com	8/27/2020 18:09	approved	8/27/2020 18:09	8/27/2020 19:30	81	United States of America
Yes	Anthony Williams	Anthony	Williams	twilliams@marincounty.org	8/27/2020 18:00	approved	8/27/2020 18:00	8/27/2020 18:19	19	United States of America
Yes	Charlie	Charlie		charlie@usa.net	8/27/2020 17:59	approved	8/27/2020 17:59	8/27/2020 19:05	67	United States of America
Yes	Nicholas Salcedo	Nicholas	Salcedo	nicholas.m.salcedo@gmail.com	8/27/2020 17:58	approved	8/27/2020 17:58	8/27/2020 19:18	80	United States of America
Yes	Erik Young	Erik	Young	fivesharks@gmail.com	8/27/2020 17:58	approved	8/27/2020 17:58	8/27/2020 18:38	40	United States of America
Yes	David Peterson	David	Peterson	dpeterson307@aol.com	8/27/2020 18:19	approved	8/27/2020 18:19	8/27/2020 19:13	54	United States of America
Yes	Barbara Salzman	Barbara	Salzman	bsalzman48@gmail.com	8/27/2020 18:02	approved	8/27/2020 18:02	8/27/2020 19:05	63	United States of America
Yes	Steph	Steph		sglitman@sbcglobal.net	8/27/2020 18:07	approved	8/27/2020 18:07	8/27/2020 18:38	32	United States of America
Yes	Christopher Martin	Christopher	Martin	zapwharf@comcast.net	8/27/2020 18:06	approved	8/27/2020 18:06	8/27/2020 18:47	41	United States of America
Yes	Sandra Guldman	Sandra	Guldman	sandra.guldman@gmail.com	8/27/2020 17:59	approved	8/27/2020 17:59	8/27/2020 18:38	40	United States of America
Yes	Julie McMillan	Julie	McMillan	juliemcmillan@comcast.net	8/27/2020 17:58	approved	8/27/2020 17:58	8/27/2020 18:38	40	United States of America
Yes	ggp	ggp		obility@comcast.net	8/27/2020 17:55	approved	8/27/2020 17:56	8/27/2020 19:59	124	United States of America
Yes	Elise Semonian	Elise	Semonian	elisesemonian@gmail.com	8/27/2020 18:11	approved	8/27/2020 18:11	8/27/2020 19:05	54	United States of America
Yes	Michael Wanger	Michael	Wanger	vidkid@well.com	8/27/2020 17:57	approved	8/27/2020 17:57	8/27/2020 18:42	46	United States of America
Yes	Peter Hogg	Peter	Hogg	system2020@msn.com	8/27/2020 18:31	approved	8/27/2020 18:31	8/27/2020 19:59	89	United States of America
Yes	Nancy Vernon	Nancy	Vernon	nvernon@marincounty.org	8/27/2020 18:02	approved	8/27/2020 18:03	8/27/2020 18:54	52	United States of America
Yes	Laura Lovett	Laura	Lovett	lelovett@earthlink.net	8/27/2020 18:02	approved	8/27/2020 18:02	8/27/2020 18:42	40	United States of America
Yes	Brian	Brian		briansalmen@gmail.com	8/27/2020 17:57	approved	8/27/2020 17:57	8/27/2020 18:51	55	United States of America
Yes	Eric Ziegler	Eric	Ziegler	eszieglер@comcast.net	8/27/2020 18:35	approved	8/27/2020 18:35	8/27/2020 18:41	7	United States of America
Yes	Richard Gumbiner	Richard	Gumbiner	rich.gumbiner@cbcnrt.com	8/27/2020 18:00	approved	8/27/2020 18:00	8/27/2020 19:31	92	United States of America
Yes	Jenny Mota	Jenny	Mota	jmota@mcds.org	8/27/2020 18:01	approved	8/27/2020 18:01	8/27/2020 18:46	46	United States of America
Yes	Pamela Scott	Pamela	Scott	pamelabscott@gmail.com	8/27/2020 19:39	approved	8/27/2020 19:39	8/27/2020 19:46	8	United States of America
Yes	Raoul Wertz	Raoul	Wertz	RaoulWertz@gmail.com	8/27/2020 17:57	approved	8/27/2020 17:57	8/27/2020 19:11	75	United States of America
Yes	Kristen Swann	Kristen	Swann	ben.swann@marinfc.com	8/27/2020 18:03	approved	8/27/2020 18:03	8/27/2020 18:29	26	United States of America
Yes	fmalin	fmalin		frmalin@aol.com	8/27/2020 18:06	approved	8/27/2020 18:06	8/27/2020 18:46	41	United States of America
Yes	Leslie	Leslie		laoconnell@sbcglobal.net	8/27/2020 17:55	approved	8/27/2020 17:56	8/27/2020 19:59	123	United States of America
Yes	Harold Sherley	Harold	Sherley	hsherley@gmail.com	8/27/2020 18:24	approved	8/27/2020 18:24	8/27/2020 18:38	14	United States of America
Yes	T Mc	TMc		tmcintire@marincounty.org	8/27/2020 17:59	approved	8/27/2020 17:59	8/27/2020 18:42	43	United States of America
Yes	TMc	TMc		tmcintire@marincounty.org			8/27/2020 18:01	8/27/2020 18:38	38	United States of America
Yes	Elizabeth Robbins	Elizabeth	Robbins	eliz.robbins@gmail.com	8/27/2020 17:59	approved	8/27/2020 17:59	8/27/2020 18:51	52	United States of America

Appendix B

Tree Removal Table and Landscaping Planting Plans

Tree Removal Table

Frederick Allen Park Planting Plans

Lower Corte Madera Creek Planting Plan

Trees Proposed for Removal

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Fish Ladder Removal and Unit 4 Grading					
Native	*Acer negundo*	Boxelder	19	Good or Excellent	Significant
Native	*Aesculus californica*	Buckeye	26	Good or Excellent	Significant
Native	*Alnus rhombifolia*	White alder	8	Good or Excellent	N/A
Native	*Alnus rhombifolia*	White alder	10	Good or Excellent	Protected
Native	*Alnus rhombifolia*	White alder	19	Good or Excellent	Significant
Native	*Alnus rhombifolia*	White alder	19.5	Good or Excellent	Significant
Native	*Alnus rhombifolia*	White alder	20.5	Good or Excellent	Significant
Native	*Fraxinus dipetala*	Two petaled ash	12	Good or Excellent	Significant
Native	*Fraxinus dipetala*	Two petaled ash	13	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	22	Good or Excellent	Significant
Native	*Salix lasiolepis*	Arroyo willow	8	Good or Excellent	Protected
Native	*Salix lasiolepis*	Arroyo willow	10	Good or Excellent	Protected
Native	*Salix lasiolepis*	Arroyo willow	11.5	Fair or Marginal	Protected
Native	*Salix lasiolepis*	Arroyo willow	14	Good or Excellent	Significant
Native	*Salix lasiolepis*	Arroyo willow	20	Good or Excellent	Significant
Native	*Salix lasiolepis*	Arroyo willow	24	Good or Excellent	Significant
Native	*Umbellularia californica*	California bay	10	Good or Excellent	Protected
Native	*Umbellularia californica*	California bay	22	Good or Excellent	Significant

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Prunus laurocerasus*	Cherry laurel	15	Fair or Marginal	Significant
Non-Native	*Salix babylonica*	Weeping willow	18	Fair or Marginal	Significant
Non-Native	*Ulmus minor*	English elm	17	Good or Excellent	Significant
Frederick Allen Park					
Native	*Acer negundo*	Boxelder	7.5	Good or Excellent	N/A
Native	*Acer negundo*	Boxelder	12	Fair or Marginal	Protected
Native	*Acer negundo*	Boxelder	31.5	Fair or Marginal	Significant
Native	*Aesculus californica*	Buckeye	8	Poor or Hazard Tree	N/A
Native	*Aesculus californica*	Buckeye	9.5	Fair or Marginal	Protected
Native	*Aesculus californica*	Buckeye	10	Fair or Marginal	Protected
Native	*Aesculus californica*	Buckeye	10.5	Good or Excellent	Protected
Native	*Aesculus californica*	Buckeye	11	Good or Excellent	Protected
Native	*Aesculus californica*	Buckeye	17	Good or Excellent	Significant
Native	*Aesculus californica*	Buckeye	20	Fair or Marginal	Significant
Native	*Aesculus californica*	Buckeye	21	Good or Excellent	Significant
Native	*Aesculus californica*	Buckeye	36	Fair or Marginal	Significant
Native	*Aesculus californica*	Buckeye	48.5	Good or Excellent	Significant
Native	*Hesperocyparis macrocarpa*	Monterey cypress	12.5	Fair or Marginal	Significant
Native	*Hesperocyparis macrocarpa*	Monterey cypress	21	Good or Excellent	Significant
Native	*Hesperocyparis macrocarpa*	Monterey cypress	38.5	Good or Excellent	Significant
Native	*Pinus radiata*	Monterey pine	31.5	Good or Excellent	Significant

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Native	*Pinus radiata*	Monterey pine	33	Fair or Marginal	Significant
Native	*Pinus radiata*	Monterey pine	35	Good or Excellent	Significant
Native	*Populus trichocarpa*	Black cottonwood	4	Fair or Marginal	N/A
Native	*Populus trichocarpa*	Black cottonwood	16	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	3	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	4	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	4	Fair or Marginal	N/A
Native	*Quercus agrifolia*	Coast live oak	4.5	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	5	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	5	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	6	Fair or Marginal	N/A
Native	*Quercus agrifolia*	Coast live oak	6	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	6	Fair or Marginal	N/A
Native	*Quercus agrifolia*	Coast live oak	6.5	Fair or Marginal	N/A
Native	*Quercus agrifolia*	Coast live oak	7	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	7	Fair or Marginal	N/A
Native	*Quercus agrifolia*	Coast live oak	7	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	7	Fair or Marginal	N/A
Native	*Quercus agrifolia*	Coast live oak	8	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	8.5	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	9	Good or Excellent	Protected

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Native	*Quercus agrifolia*	Coast live oak	9	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	9	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	9	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	9.5	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	10	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	10	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	10	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	11	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	11	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	11	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	11	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	11	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	12	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	12.5	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	13	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	14.5	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	14.5	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	15	Fair or Marginal	Significant
Native	*Quercus agrifolia*	Coast live oak	15	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	15	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	15.5	Good or Excellent	Significant

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Native	*Quercus agrifolia*	Coast live oak	16	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	16	Fair or Marginal	Significant
Native	*Quercus agrifolia*	Coast live oak	17	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	23	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	25	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	26	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	27.5	Fair or Marginal	Significant
Native	*Quercus agrifolia*	Coast live oak	28	Good or Excellent	Significant
Native	*Quercus agrifolia*	Coast live oak	28	Fair or Marginal	Significant
Native	*Quercus agrifolia*	Coast live oak	34.5	Good or Excellent	Significant
Native	*Quercus garryana*	Oregon oak	8.5	Good or Excellent	Protected
Native	*Quercus garryana*	Oregon oak	14	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	4	Good or Excellent	N/A
Native	*Quercus lobata*	Valley oak	4	Good or Excellent	N/A
Native	*Quercus lobata*	Valley oak	6	Fair or Marginal	N/A
Native	*Quercus lobata*	Valley oak	7	Good or Excellent	N/A
Native	*Quercus lobata*	Valley oak	7	Good or Excellent	N/A
Native	*Quercus lobata*	Valley oak	7.5	Good or Excellent	N/A
Native	*Quercus lobata*	Valley oak	8	Good or Excellent	N/A
Native	*Quercus lobata*	Valley oak	9	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	10	Poor or Hazard Tree	Protected

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Native	*Quercus lobata*	Valley oak	10.5	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	13	Good or Excellent	Significant
Native	*Quercus lobata*	Valley oak	13	Good or Excellent	Significant
Native	*Quercus lobata*	Valley oak	13	Good or Excellent	Significant
Native	*Quercus lobata*	Valley oak	14	Good or Excellent	Significant
Native	*Quercus lobata*	Valley oak	16.5	Good or Excellent	Significant
Native	*Quercus lobata*	Valley oak	17	Good or Excellent	Significant
Native	*Quercus lobata*	Valley oak	17.5	Fair or Marginal	Significant
Native	*Quercus lobata*	Valley oak	19.5	Good or Excellent	Significant
Native	*Umbellularia californica*	California bay	4.5	Fair or Marginal	N/A
Native	*Umbellularia californica*	California bay	12.5	Fair or Marginal	N/A
Native	*Umbellularia californica*	California bay	27	Good or Excellent	Significant
Non-Native	*Acacia mearnsii*	Black wattle	4	Good or Excellent	N/A
Non-Native	*Acacia mearnsii*	Black wattle	4.5	Good or Excellent	N/A
Non-Native	*Acacia mearnsii*	Black wattle	10.5	Good or Excellent	Protected
Non-Native	*Acacia mearnsii*	Black wattle	34	Good or Excellent	Significant
Non-Native	*Acacia melanoxylon*	Blackwood acacia	12.5	Good or Excellent	Significant
Non-Native	*Acacia melanoxylon*	Blackwood acacia	20	Good or Excellent	Significant
Non-Native	*Acer palmatum*	Japanese maple	3	Good or Excellent	N/A
Non-Native	*Acer palmatum*	Japanese maple	3	Fair or Marginal	N/A
Non-Native	*Acer palmatum*	Japanese maple	4	Fair or Marginal	N/A

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Acer palmatum*	Japanese maple	4.5	Fair or Marginal	N/A
Non-Native	*Acer palmatum*	Japanese maple	11	Good or Excellent	N/A
Non-Native	*Acer platanoides*	Norway maple	5	Good or Excellent	N/A
Non-Native	*Arbutus unedo*	Strawberry tree	5	Good or Excellent	N/A
Non-Native	*Arbutus unedo*	Strawberry tree	7.5	Fair or Marginal	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	4	Good or Excellent	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	5.5	Good or Excellent	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	9	Good or Excellent	Protected
Non-Native	*Ligustrum lucidum*	Glossy privet	10	Good or Excellent	Protected
Non-Native	*Ligustrum lucidum*	Glossy privet	12	Good or Excellent	Protected
Non-Native	*Ligustrum lucidum*	Glossy privet	13.5	Good or Excellent	Significant
Non-Native	*Ligustrum lucidum*	Glossy privet	19	Good or Excellent	Significant
Non-Native	*Magnolia grandiflora*	Southern magnolia	6	Good or Excellent	N/A
Non-Native	*Magnolia grandiflora*	Southern magnolia	7	Good or Excellent	N/A
Non-Native	*Magnolia grandiflora*	Southern magnolia	7	Good or Excellent	N/A
Non-Native	*Photinia serratifolia*	Taiwanese photinia	7	Fair or Marginal	N/A
Non-Native	*Photinia serratifolia*	Taiwanese photinia	7.5	Fair or Marginal	N/A
Non-Native	*Photinia serratifolia*	Taiwanese photinia	7.5	Fair or Marginal	N/A
Non-Native	*Photinia serratifolia*	Taiwanese photinia	9	Fair or Marginal	Protected
Non-Native	*Photinia serratifolia*	Taiwanese photinia	13	Fair or Marginal	Significant
Non-Native	*Pistacia chinensis*	Chinese pistachio	7	Good or Excellent	N/A

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Pistacia chinensis*	Chinese pistachio	7.5	Good or Excellent	N/A
Non-Native	*Pistacia chinensis*	Chinese pistachio	8	Good or Excellent	N/A
Non-Native	*Pistacia chinensis*	Chinese pistachio	8	Good or Excellent	N/A
Non-Native	*Pistacia chinensis*	Chinese pistachio	8	Good or Excellent	N/A
Non-Native	*Pistacia chinensis*	Chinese pistachio	8.5	Good or Excellent	Protected
Non-Native	*Pistacia chinensis*	Chinese pistachio	8.5	Good or Excellent	Protected
Non-Native	*Pistacia chinensis*	Chinese pistachio	9	Good or Excellent	Protected
Non-Native	*Pistacia chinensis*	Chinese pistachio	9	Good or Excellent	Protected
Non-Native	*Pistacia chinensis*	Chinese pistachio	9.5	Good or Excellent	Protected
Non-Native	*Pistacia chinensis*	Chinese pistachio	9.5	Good or Excellent	Protected
Non-Native	*Pistacia chinensis*	Chinese pistachio	10	Good or Excellent	Protected
Non-Native	*Pistacia chinensis*	Chinese pistachio	12	Good or Excellent	Protected
Non-Native	*Pistacia chinensis*	Chinese pistachio	16	Good or Excellent	Significant
Non-Native	*Pistacia chinensis*	Chinese pistachio	17	Good or Excellent	Significant
Non-Native	*Prunus americana*	American plum	6	Fair or Marginal	N/A
Non-Native	*Prunus americana*	American plum	7	Fair or Marginal	N/A
Non-Native	*Prunus americana*	American plum	19.5	Good or Excellent	Significant
Non-Native	*Prunus cerasifera*	Cherry plum	6.5	Good or Excellent	N/A
Non-Native	*Prunus fremontii*	Apricot	6.5	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	6	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	10	Good or Excellent	Protected

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Ulmus minor*	English elm	23	Good or Excellent	Significant
Floodwall (Segment #3)					
Native	*Aesculus californica*	Buckeye	11.5	Fair or Marginal	Protected
Native	*Aesculus californica*	Buckeye	16.5	Good or Excellent	Protected
Native	*Aesculus californica*	Buckeye	26	Fair or Marginal	Protected
Native	*Aesculus californica*	Buckeye	36.5	Fair or Marginal	Protected
Native	*Calocedrus decurrens*	Incense cedar	15	Good or Excellent	N/A
Native	*Calocedrus decurrens*	Incense cedar	16	Good or Excellent	N/A
Native	*Fraxinus latifolia*	Oregon ash	8	Fair or Marginal	N/A
Native	*Fraxinus latifolia*	Oregon ash	8.5	Fair or Marginal	N/A
Native	*Fraxinus latifolia*	Oregon ash	9	Good or Excellent	N/A
Native	*Fraxinus latifolia*	Oregon ash	32	Fair or Marginal	Protected
Native	*Hesperocyparis macrocarpa*	Monterey cypress	6	Good or Excellent	N/A
Native	*Hesperocyparis macrocarpa*	Monterey cypress	41	Fair or Marginal	N/A
Native	*Juglans hindsii*	Northern california black walnut	10.5	Fair or Marginal	N/A
Native	*Pinus radiata*	Monterey pine	31	Fair or Marginal	N/A
Native	*Quercus agrifolia*	Coast live oak	3	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	4	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	5	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	7	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	7.5	Good or Excellent	Protected

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Native	*Quercus agrifolia*	Coast live oak	8	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	8	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	10	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	12	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	12	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	15	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	20.5	Fair or Marginal	Heritage
Native	*Quercus agrifolia*	Coast live oak	26.5	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	36	Good or Excellent	Heritage
Native	*Quercus lobata*	Valley oak	3.5	Good or Excellent	N/A
Native	*Quercus lobata*	Valley oak	7.5	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	8.5	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	10	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	11	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	12	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	13	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	15	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	19	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	23.5	Good or Excellent	Heritage
Native	*Umbellularia californica*	California bay	7.5	Good or Excellent	N/A
Native	*Umbellularia californica*	California bay	17	Fair or Marginal	Protected

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Native	*Umbellularia californica*	California bay	48	Good or Excellent	Protected
Non-Native	*Acacia mearnsii*	Black wattle	11	Fair or Marginal	N/A
Non-Native	*Acacia mearnsii*	Black wattle	12	Fair or Marginal	N/A
Non-Native	*Acacia mearnsii*	Black wattle	15	Good or Excellent	N/A
Non-Native	*Araucaria araucana*	Monkey puzzle tree	21	Good or Excellent	N/A
Non-Native	*Arbutus unedo*	Strawberry tree	9.5	Fair or Marginal	N/A
Non-Native	*Arbutus unedo*	Strawberry tree	12	Fair or Marginal	N/A
Non-Native	*Arbutus unedo*	Strawberry tree	16.5	Fair or Marginal	N/A
Non-Native	*Arbutus unedo*	Strawberry tree	17	Good or Excellent	N/A
Non-Native	*Arbutus unedo*	Strawberry tree	17.5	Fair or Marginal	N/A
Non-Native	*Arbutus unedo*	Strawberry tree	20	Fair or Marginal	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	4	Good or Excellent	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	5	Good or Excellent	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	10.5	Good or Excellent	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	11.5	Good or Excellent	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	12.5	Good or Excellent	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	16	Fair or Marginal	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	16.5	Good or Excellent	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	24	Fair or Marginal	N/A
Non-Native	*Malus pumila*	Paradise apple	4	Fair or Marginal	N/A
Non-Native	*Olea europaea*	Olive	10.5	Fair or Marginal	N/A

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Olea europaea*	Olive	15	Fair or Marginal	N/A
Non-Native	*Phoenix canariensis*	Canary island date palm	19	Good or Excellent	N/A
Non-Native	*Phoenix canariensis*	Canary island date palm	37	Good or Excellent	N/A
Non-Native	*Phoenix canariensis*	Canary island date palm	40	Fair or Marginal	N/A
Non-Native	*Phoenix canariensis*	Canary island date palm	50	Good or Excellent	N/A
Non-Native	*Prunus americana*	American plum	5	Good or Excellent	N/A
Non-Native	*Prunus americana*	American plum	9	Good or Excellent	N/A
Non-Native	*Prunus cerasifera*	Cherry plum	4	Fair or Marginal	N/A
Non-Native	*Prunus cerasifera*	Cherry plum	6	Fair or Marginal	N/A
Non-Native	*Prunus laurocerasus*	Cherry laurel	17	Good or Excellent	N/A
Non-Native	*Salix babylonica*	Weeping willow	25	Good or Excellent	N/A
Non-Native	*Schinus terebinthifolius*	Brazilian pepper tree	12	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	2	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	4	Fair or Marginal	N/A
Non-Native	*Ulmus minor*	English elm	5.5	Fair or Marginal	N/A
Non-Native	*Ulmus minor*	English elm	6	Poor or Hazard Tree	N/A
Non-Native	*Ulmus minor*	English elm	6.5	Fair or Marginal	N/A
Non-Native	*Ulmus minor*	English elm	7.5	Fair or Marginal	N/A
Non-Native	*Ulmus minor*	English elm	8	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	10	Fair or Marginal	N/A
Non-Native	*Ulmus minor*	English elm	12	Fair or Marginal	N/A

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Ulmus minor*	English elm	12	Fair or Marginal	N/A
Stormwater pump station					
Native	*Quercus agrifolia*	Coast live oak	4	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	8	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	8.5	Good or Excellent	Protected
Non-Native	*Acacia mearnsii*	Black wattle	17	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	7	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	15	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	17	Good or Excellent	N/A
Non-Native	*Ulmus parvifolia*	Siberian elm	20	Good or Excellent	N/A
Floodwall (Segment #2)					
Non-Native	*Ailanthus altissima*	Tree of heaven	12	Poor or Hazard Tree	N/A
Non-Native	*Pistacia chinensis*	Chinese pistachio	10	Good or Excellent	N/A
Non-Native	*Pistacia chinensis*	Chinese pistachio	13	Fair or Marginal	N/A
Floodwall (Segment #1)					
Native	*Pinus radiata*	Monterey pine	24	Fair or Marginal	N/A
Native	*Quercus agrifolia*	Coast live oak	4	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	4	Fair or Marginal	N/A
Native	*Quercus agrifolia*	Coast live oak	5	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	5	Good or Excellent	N/A
Native	*Quercus agrifolia*	Coast live oak	6	Fair or Marginal	Protected

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Native	*Quercus agrifolia*	Coast live oak	6	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	6	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	6	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	7	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	7	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	7	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	8	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	9	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	10	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	11	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	11.5	Fair or Marginal	Protected
Native	*Quercus agrifolia*	Coast live oak	20	Good or Excellent	Protected
Native	*Quercus agrifolia*	Coast live oak	20	Good or Excellent	Heritage
Native	*Quercus agrifolia*	Coast live oak	24.5	Poor or Hazard Tree	N/A
Native	*Quercus agrifolia*	Coast live oak	26	Good or Excellent	Heritage
Native	*Quercus agrifolia*	Coast live oak	27	Good or Excellent	Heritage
Native	*Quercus lobata*	Valley oak	13.5	Good or Excellent	Protected
Native	*Quercus lobata*	Valley oak	25.5	Good or Excellent	Heritage
Native	*Umbellularia californica*	California bay	8	Good or Excellent	N/A
Native	*Umbellularia californica*	California bay	22	Good or Excellent	Protected
Native	*Umbellularia californica*	California bay	28.5	Good or Excellent	Protected

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Acacia mearnsii*	Black wattle	5	Fair or Marginal	N/A
Non-Native	*Acacia mearnsii*	Black wattle	9	Fair or Marginal	N/A
Non-Native	*Acacia mearnsii*	Black wattle	9	Good or Excellent	N/A
Non-Native	*Acacia mearnsii*	Black wattle	12	Good or Excellent	N/A
Non-Native	*Acacia mearnsii*	Black wattle	12	Good or Excellent	N/A
Non-Native	*Acacia mearnsii*	Black wattle	16	Good or Excellent	N/A
Non-Native	*Acacia mearnsii*	Black wattle	30	Good or Excellent	N/A
Non-Native	*Acacia mearnsii*	Black wattle	31	Good or Excellent	N/A
Non-Native	*Cinnamomum camphora*	Camphortree	5	Good or Excellent	N/A
Non-Native	*Eucalyptus camaldulensis*	Red gum	12.5	Good or Excellent	N/A
Non-Native	*Eucalyptus camaldulensis*	Red gum	13	Good or Excellent	N/A
Non-Native	*Eucalyptus camaldulensis*	Red gum	13.5	Good or Excellent	N/A
Non-Native	*Eucalyptus camaldulensis*	Red gum	17.5	Good or Excellent	N/A
Non-Native	*Eucalyptus camaldulensis*	Red gum	24	Good or Excellent	N/A
Non-Native	*Eucalyptus camaldulensis*	Red gum	25	Good or Excellent	N/A
Non-Native	*Eucalyptus camaldulensis*	Red gum	29	Good or Excellent	N/A
Non-Native	*Eucalyptus camaldulensis*	Red gum	48	Good or Excellent	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	4	Fair or Marginal	N/A
Non-Native	*Ligustrum lucidum*	Glossy privet	23	Good or Excellent	N/A
Non-Native	*Morus alba*	Mulberry	8.5	Good or Excellent	N/A
Non-Native	*Morus alba*	Mulberry	9	Good or Excellent	N/A

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Morus alba*	Mulberry	13	Good or Excellent	N/A
Non-Native	*Myoporum laetum*	Ngaio tree	8.5	Poor or Hazard Tree	N/A
Non-Native	*Myoporum laetum*	Ngaio tree	17	Fair or Marginal	N/A
Non-Native	*Olea europaea*	Olive	7	Fair or Marginal	N/A
Non-Native	*Olea europaea*	Olive	37.5	Good or Excellent	N/A
Non-Native	*Platanus occidentalis*	American sycamore	10.5	Good or Excellent	N/A
Non-Native	*Pyrus calleryana*	Callery pear	6	Fair or Marginal	N/A
Non-Native	*Pyrus calleryana*	Callery pear	8	Fair or Marginal	N/A
Non-Native	*Pyrus calleryana*	Callery pear	10	Fair or Marginal	N/A
Non-Native	*Pyrus calleryana*	Callery pear	11	Good or Excellent	N/A
Non-Native	*Salix babylonica*	Weeping willow	26	Good or Excellent	N/A
Non-Native	*Schinus molle*	Peruvian pepper tree	9	Fair or Marginal	N/A
Non-Native	*Schinus molle*	Peruvian pepper tree	10.5	Good or Excellent	N/A
Non-Native	*Schinus molle*	Peruvian pepper tree	11.5	Fair or Marginal	N/A
Non-Native	*Schinus molle*	Peruvian pepper tree	11.5	Fair or Marginal	N/A
Non-Native	*Ulmus minor*	English elm	4.5	Fair or Marginal	N/A
Non-Native	*Ulmus minor*	English elm	5	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	5.5	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	6	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	10.5	Good or Excellent	N/A
Non-Native	*Ulmus minor*	English elm	12	Good or Excellent	N/A

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Ulmus minor*	English elm	25	Fair or Marginal	N/A
Non-Native	*Ulmus minor*	English elm	29	Poor or Hazard Tree	N/A
Lower College of Marin Concrete Channel Removal[b]					
Native	*Quercus spp.*	Oak	6	--	Protected[c]
Native	*Quercus spp.*	Oak	14	--	Protected[c]
Native	*Quercus spp.*	Oak	16	--	Protected[c]
Non-Native	*Acacia spp.*	Acacia	8	--	N/A
Non-Native	*Acacia spp.*	Acacia	8	--	N/A
Non-Native	*Acacia spp.*	Acacia	6	--	N/A
Non-Native	*Acacia spp.*	Acacia	6	--	N/A
Non-Native	*Acacia spp.*	Acacia	6	--	N/A
Non-Native	*Acacia spp.*	Acacia	6	--	N/A
Non-Native	*Acacia spp.*	Acacia	6	--	N/A
Non-Native	*Acacia spp.*	Acacia	6	--	N/A
Non-Native	*Acacia spp.*	Acacia	6	--	N/A
Non-Native	*Acacia spp.*	Acacia	8	--	N/A
Non-Native	*Acacia spp.*	Acacia	8	--	N/A
Non-Native	*Acacia spp.*	Acacia	8	--	N/A
Non-Native	*Acacia spp.*	Acacia	8	--	N/A
Non-Native	*Acacia spp.*	Acacia	8	--	N/A
Non-Native	*Acacia spp.*	Acacia	8	--	N/A

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation
Non-Native	*Acacia spp.*	Acacia	8	--	N/A
Non-Native	*Acacia spp.*	Acacia	10	--	N/A
Non-Native	*Acacia spp.*	Acacia	10	--	N/A
Non-Native	*Acacia spp.*	Acacia	10	--	N/A
Non-Native	*Acacia spp.*	Acacia	12	--	N/A
Non-Native	*Acacia spp.*	Acacia	12	--	N/A
Non-Native	*Acacia spp.*	Acacia	12	--	N/A
Non-Native	*Acacia spp.*	Acacia	18	--	N/A
Non-Native	*Arecaceae spp.*	Palm	--	--	N/A
Non-Native	*Arecaceae spp.*	Palm	--	--	N/A
Non-Native	*Arecaceae spp.*	Palm	--	--	N/A
Non-Native	*Eucalyptus spp.*	Eucalyptus	10	--	N/A
Non-Native	*Eucalyptus spp.*	Eucalyptus	8	--	N/A
Non-Native	*Eucalyptus spp.*	Eucalyptus	12	--	N/A
Non-Native	*Eucalyptus spp.*	Eucalyptus	20	--	N/A
Non-Native	*Ligustrum spp.*	Privet	8	--	N/A
Non-Native	*Ligustrum spp.*	Privet	8	--	N/A
Non-Native	*Ligustrum spp.*	Privet	8	--	N/A
Non-Native	*Prunus spp.*	Prunus	6	--	N/A
Non-Native	*Prunus spp.*	Prunus	6	--	N/A
Non-Native	*Prunus spp.*	Prunus	12	--	N/A

APPENDIX B

Native	Latin Name	Common Name	DBH[a]	Tree Health Condition	Designation

Notes:

If the United States Army Corps of Engineers (USACE) requires a 15-foot setback from the existing channel, 184 fewer trees would need to be removed including 18 trees from Unit 4, 71 trees from Frederick Allen Park, 88 trees from the floodwalls, 6 trees from the stormwater pump station, and 1 tree from the Lower College of Marin concrete channel removal.

[a] For trees with multiple branches at breast height, the diameter at breast height (DBH) data for sums the branches.

[b] The Lower College of Marin concrete channel tree survey was conducted for trees with 6" DBH or greater. The genus of each tree was noted, but the specific tree species was not determined. The health of each tree was not determined.

[c] The specific species and single branch DBH are unknown for this tree. Designation is given to conservatively estimate removal tree replacement ratio based on definition for other protected or heritage oak species.

Tree health descriptions:

A tree in "good or excellent condition" – little or no existing disease or damage in canopy or roots
A tree in "fair or marginal condition" – minor existing disease or damage in canopy or roots
A tree in "poor condition or creating a hazard" to a building and/or structure – major existing disease or damage in canopy or roots

Designation:

Tree designation is identified based on definitions provided in Town of Ross Municipal Code Section 12.21.020 Definitions and Marin County Municipal Code Section 22.130.030 Definitions of Specialized Terms and Phrases.

Town of Ross Municipal Code definitions for "protected tree" and "significant tree" are used to designate trees located within Town of Ross, including trees located within Fish Ladder Removal and Unit 4 Grading and Frederick Allen Park.

Marin County Municipal Code definitions for "protected tree" and "heritage tree" are used to designate trees located outside Town of Ross, including trees located in Floodwalls (segments #1, #2, and #3), Stormwater Pump Station, and Lower College of Marin Concrete Channel Removal areas.

"N/A" designation indicates a tree does not meet the definitions of "significant tree", "protected tree", or "heritage tree" as defined in Town of Ross and Marin County Municipal Codes.

Sources: (Marin County, 2020; Town of Ross, 2020).

References

Marin County. (2020, November 16). Marin County Municipal Code. Retrieved from https://library.municode.com/ca/marin_county/codes/municipal_code

Town of Ross. (2020). *Municipal Code*. Retrieved July 29, 2020, from https://www.townofross.org/administration/page/municipal-code

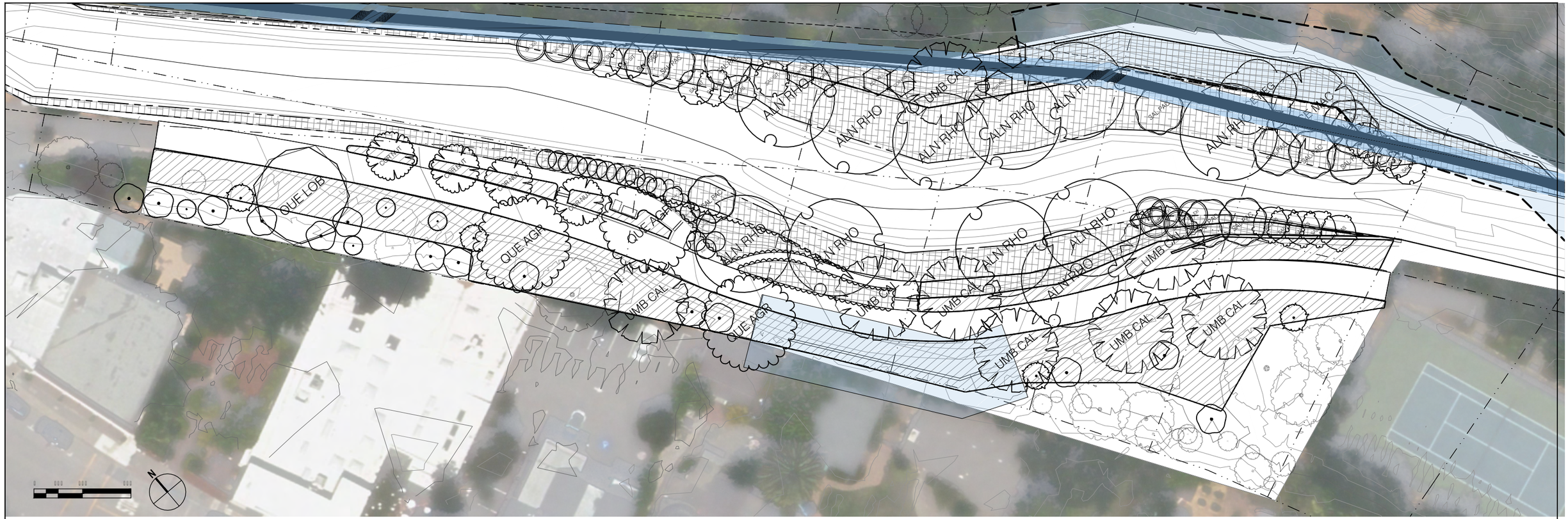
Appendix B

Tree Removal Table and Landscaping Planting Plans

Tree Removal Table

Frederick Allen Park Planting Plans

Lower Corte Madera Creek Planting Plan



PLANTING PLAN

TREES	CODE	BOTANICAL NAME	COMMON NAME	SIZE	WUCOLS	QTY
	EXI 5E5	Existing Tree		---		27
ACE MAC	ACE MAC	Acer macrophyllum	Big Leaf Maple	15 GAL	M	1
ACE NEG	ACE NEG	Acer negundo	Box Elder	15 GAL	M	1
ALN RHO	ALN RHO	Alnus rhombifolia	White Alder	15 GAL	M	11
COR NUT	COR NUT	Cornus nuttallii	Western Flowering Dogwood	8` TRUNK HT SINGLE TRUNK	M	4
COR RES	COR RE5	Cornus sericea	Red Twig Dogwood	5 GAL		6
PHY CAP	PHY CAP	Physocarpus capitatus	Pacific Ninebark	5 GAL		18
QUE AGR	QUE AGR	Quercus agrifolia	Coast Live Oak	36" BOX	VL	3
QUE LOB	QUE LOB	Quercus lobata	Valley Oak	24" BOX	L	1
SAL EXI	SAL EXI	Salix exigua	Coyote Willow	STAKES		8
SAL PAC	SAL PAC	Salix lasiandra	Pacific Willow	1 GAL		12
SAL LAS	SAL LAS	Salix lasiolepis	Arroyo Willow	STAKES		7
SAL SIT	SAL SIT	Salix sitchensis	Sitka Willow	STAKES		9
UMB CAL	UMB CAL	Umbellularia californica	Bay Laurel	8` TRUNK HT	M	8

SHRUBS	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY
	CEA TH2	Ceanothus thyrsiflorus	Blue Blossom	15 GAL	4
	HET ARB	Heteromeles arbutifolia	Toyon	15 GAL	14
	SAM CA2	Sambucus nigra caerulea	Blue Elderberry	5 GAL	4

SHRUB AREAS	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY
		UPPER RIGHT BANK SHRUBS			12,561 sf
	BER AQ3	Berberis aquifolium	Oregon Grape	#5	37
	BER BAT	Berberis pinnata	Coast Barberry	#5	8
	DAN CA2	Danthonia californica	California Oatgrass	PLUGS	1,306
	DIP AUR	Diplacus aurantiacus	Sticky Monkeyflower	#1	73
	FES RE4	Festuca rubra	Red Fescue	PLUGS	1,306
	FRA CA3	Frangula californica	California Buckthorn	#5	27
	MON VIL	Monardella villosa	Coyote Mint	#1	10,444
	RIB CH2	Ribes malvaceum	Chaparral Currant	#5	16
	RIB SA2	Ribes sanguineum	Red Flowering Currant	#5	11
	RIB SPE	Ribes speciosum	Fuchsia Flowering Gooseberry	#5	19
	SAL SON	Salvia sonomensis	Creeping Sage	#1	54

	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY
		FLOODPLAIN UNDERSTORY			11,416 sf
	CAR DE2	Carex densa	Dense Sedge	PLUGS	445
	CAR NU2	Carex nudata	California Black-flowering Sedge	PLUGS	149
	CYP ER2	Cyperus eragrostis	Tall Umbrella Sedge	PLUGS	149
	FES RE3	Festuca rubra	Red Fescue	PLUGS	445
	HOR BR2	Hordeum brachyantherum	Meadow Barley	PLUGS	149
	LUP RIV	Lupinus rivularis	Riverbank Lupine	#1	60
	PET PAL	Petasites frigidus palmatus	Arctic Sweet Colts Foot	#1	23
	ROS GY2	Rosa gymnocarpa	Dwarf Rose	#1	24
	ROS NU2	Rosa nutkana	Nootka Rose	#1	19
	RUB UR2	Rubus ursinus	California Blackberry	#1	19
	STA AJU	Stachys ajugoides	Bugle Hedgenettle	PLUGS	66
	VIT CA2	Vitis californica	California Wild Grape	#1	6
		UPPER RIPARIAN SHRUBS			6,176 sf
	BER AQ2	Berberis aquifolium	Oregon Grape	#5	18
	CAL OC2	Calycanthus occidentalis	Spice Bush	#5	16
	PHY CA3	Physocarpus capitatus	Pacific Ninebark	#5	6
	ROS CA2	Rosa californica	California Wild Rose	#1	21
	ROS NUT	Rosa nutkana	Nootka Rose	#1	9

PLANT SCHEDULE

PRELIMINARY

GHD

Michael Love & Associates
Hydrologic Solutions
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CORTE MADERA CREEK FISH PASSAGE
ALLEN PARK
PRELIMINARY PLANTING PLAN - REDUCED
11211523

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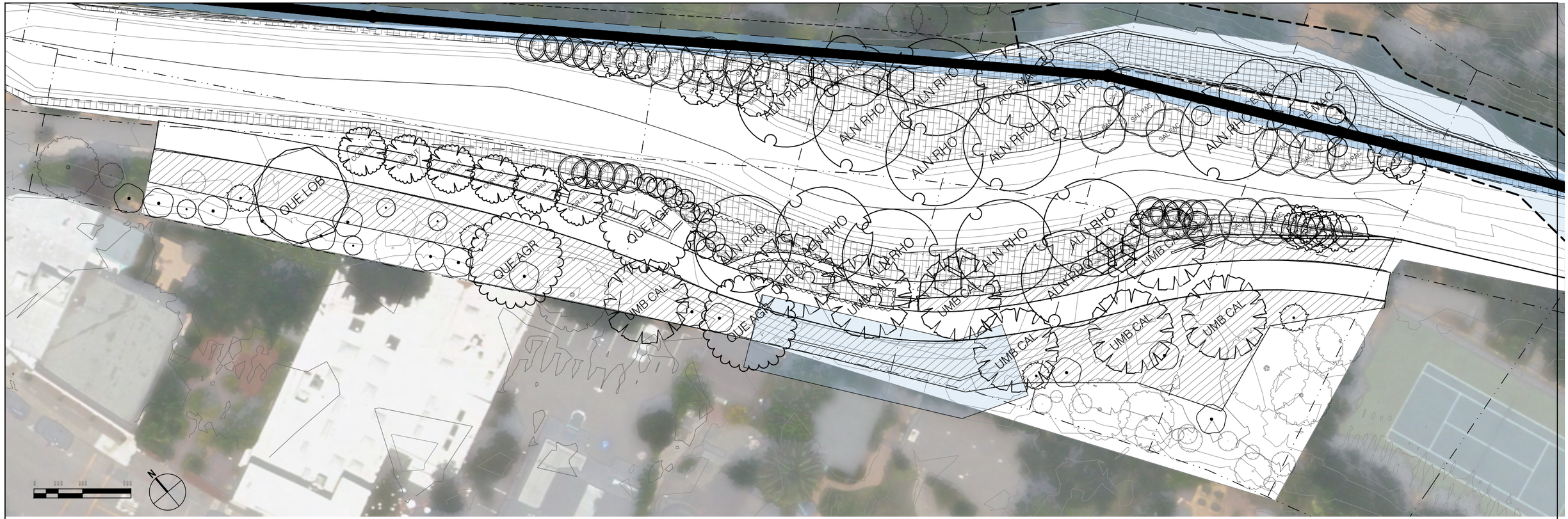

PLANTING PLAN

TREES	CODE	BOTANICAL NAME	COMMON NAME	SIZE	WUCOLS	QTY
	EXI 5E5	Existing Tree		—		27
ACE MAC	ACE MAC	Acer macrophyllum	Big Leaf Maple	15 GAL	M	2
ACE NEG	ACE NEG	Acer negundo	Box Elder	15 GAL	M	2
ALN RHO	ALN RHO	Alnus rhombifolia	White Alder	15 GAL	M	13
COR NUT	COR NUT	Cornus nuttallii	Western Flowering Dogwood	8` TRUNK HT SINGLE TRUNK	M	6
COR RES	COR RE5	Cornus sericea	Red Twig Dogwood	5 GAL		10
PHY CAP	PHY CAP	Physocarpus capitatus	Pacific Ninebark	5 GAL		16
QUE AGR	QUE AGR	Quercus agrifolia	Coast Live Oak	36" BOX	VL	3
QUE LOB	QUE LOB	Quercus lobata	Valley Oak	24" BOX	L	1
SAL EXI	SAL EXI	Salix exigua	Coyote Willow	STAKES		17
SAL PAC	SAL PAC	Salix lasiandra	Pacific Willow	1 GAL		14
SAL LAS	SAL LAS	Salix lasiolepis	Arroyo Willow	STAKES		11
SAL SIT	SAL SIT	Salix sitchensis	Sitka Willow	STAKES		9
UMB CAL	UMB CAL	Umbellularia californica	Bay Laurel	8` TRUNK HT	M	8

SHRUBS	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY
	CEA TH2	Ceanothus thyrsiflorus	Blue Blossom	15 GAL	4
	HET ARB	Heteromeles arbutifolia	Toyon	15 GAL	14
	SAM CA2	Sambucus nigra caerulea	Blue Elderberry	5 GAL	4

SHRUB AREAS	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY
		UPPER RIGHT BANK SHRUBS			12,561 sf
	BER AQ3	Berberis aquifolium	Oregon Grape	#5	37
	BER BAT	Berberis pinnata	Coast Barberry	#5	8
	CAL OC3	Calycanthus occidentalis	Spice Bush	#5	11
	DAN CA2	Danthonia californica	California Oatgrass	PLUGS	1,306
	DIP AUR	Diplacus aurantiacus	Sticky Monkeyflower	#1	73
	FES RE4	Festuca rubra	Red Fescue	PLUGS	1,306
	FRA CA3	Frangula californica	California Buckthorn	#5	27
	MON VIL	Monardella villosa	Coyote Mint	#1	10,444
	RIB CH2	Ribes malvaceum	Chaparral Currant	#5	27
	RIB SA2	Ribes sanguineum	Red Flowering Currant	#5	11
	RIB SPE	Ribes speciosum	Fuchsia Flowering Gooseberry	#5	19
	SAL SON	Salvia sonomensis	Creeping Sage	#1	107

	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY
		FLOODPLAIN UNDERSTORY			11,416 sf
	CAR DE2	Carex densa	Dense Sedge	PLUGS	445
	CAR NU2	Carex nudata	California Black-flowering Sedge	PLUGS	149
	CLI DO2	Clinopodium douglasii	Yerba Buena	PLUGS	89
	CYP ER2	Cyperus eragrostis	Tall Umbrella Sedge	PLUGS	149
	DES EL2	Deschampsia elongata	Slender Hairgrass	PLUGS	149
	ERY GU2	Erythranthe guttata	Yellow Monkeyflower	#1	89
	FES RE3	Festuca rubra	Red Fescue	PLUGS	742
	HOR BR2	Hordeum brachyantherum	Meadow Barley	PLUGS	149
	LUP RIV	Lupinus rivularis	Riverbank Lupine	#1	60
	OEN HOE	Oenothera elata hookerii	California Evening Primrose	PLUGS	53
	PET PAL	Petasites frigidus palmatus	Arctic Sweet Colts Foot	—	23
	PRU VU4	Prunella vulgaris	Self-Heal	PLUGS	475
	ROS GY2	Rosa gymnocarpa	Dwarf Rose	#1	24
	ROS NU2	Rosa nutkana	Nootka Rose	#1	19
	RUB UR2	Rubus ursinus	California Blackberry	#1	19
	STA AJU	Stachys ajugoides	Bugle Hedgenettle	#1	66
	VIT CA2	Vitis californica	California Wild Grape	#1	6
		UPPER RIPARIAN SHRUBS			6,176 sf
	BER AQ2	Berberis aquifolium	Oregon Grape	#5	36
	CAL OC2	Calycanthus occidentalis	Spice Bush	#5	26
	PHY CA3	Physocarpus capitatus	Pacific Ninebark	#5	31
	ROS CA2	Rosa californica	California Wild Rose	#1	41
	ROS NUT	Rosa nutkana	Nootka Rose	#1	27

PLANT SCHEDULE

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CORTE MADERA CREEK FISH PASSAGE
ALLEN PARK
PRELIMINARY PLANTING PLAN W/FLOODWALL SETBACKS
11211523

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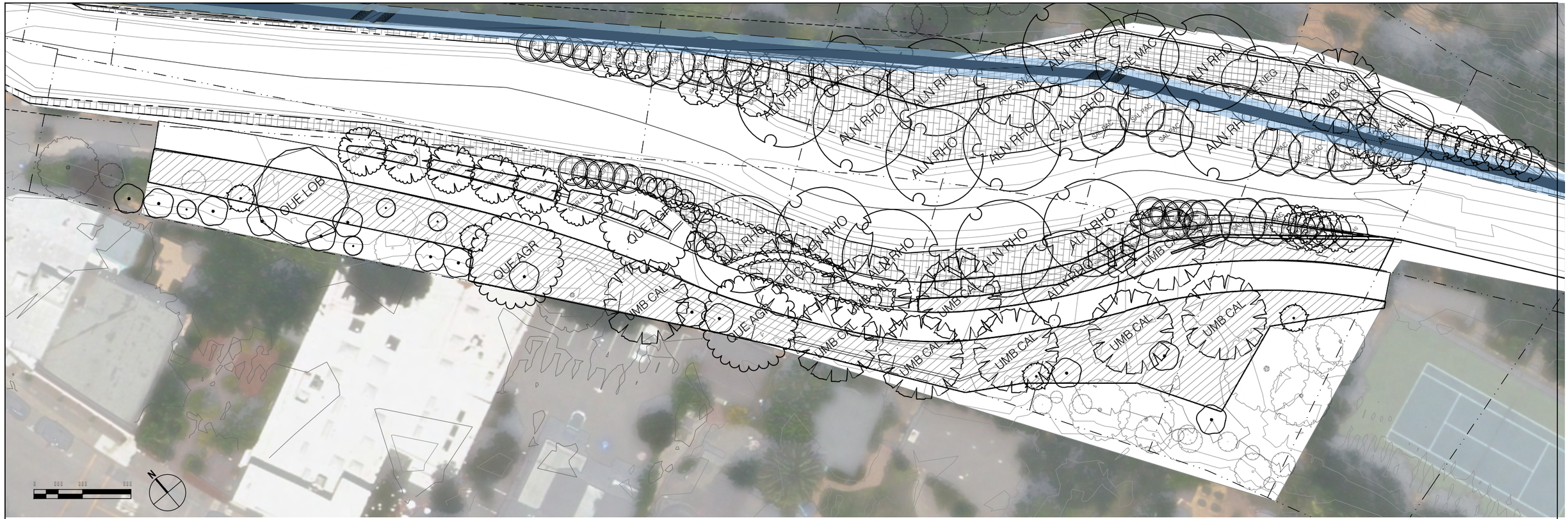

PLANTING PLAN

TREES	CODE	BOTANICAL NAME	COMMON NAME	SIZE	WUCOLS	QTY
	EXI 5E5	Existing Tree		---		27
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ACE NEG	ACE NEG	Acer negundo	Box Elder	15 GAL	M	3
ALN RHO	ALN RHO	Alnus rhombifolia	White Alder	15 GAL	M	15
COR NUT	COR NUT	Cornus nuttallii	Western Flowering Dogwood	8` TRUNK HT SINGLE TRUNK	M	6
COR RE5	COR RE5	Cornus sericea	Red Twig Dogwood	5 GAL		10
PHY CAP	PHY CAP	Physocarpus capitatus	Pacific Ninebark	5 GAL		12
QUE AGR	QUE AGR	Quercus agrifolia	Coast Live Oak	36" BOX	VL	3
QUE LOB	QUE LOB	Quercus lobata	Valley Oak	24" BOX	L	1
SAL EXI	SAL EXI	Salix exigua	Coyote Willow	STAKES		17
SAL PAC	SAL PAC	Salix lasiandra	Pacific Willow	1 GAL		16
SAL LAS	SAL LAS	Salix lasiolepis	Arroyo Willow	STAKES		11
SAL SIT	SAL SIT	Salix sitchensis	Sitka Willow	STAKES		18
UMB CAL	UMB CAL	Umbellularia californica	Bay Laurel	8` TRUNK HT	M	11

SHRUBS	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY
	CEA TH2	Ceanothus thyrsiflorus	Blue Blossom	15 GAL	4
	HET ARB	Heteromeles arbutifolia	Toyon	15 GAL	14
	SAM CA2	Sambucus nigra caerulea	Blue Elderberry	5 GAL	4

SHRUB AREAS	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY
		UPPER RIGHT BANK SHRUBS			12,561 sf
	BER AQ3	Berberis aquifolium	Oregon Grape	#5	37
	BER BAT	Berberis pinnata	Coast Barberry	#5	8
	BER PN3	Berberis pinnata pinnata	California Barberry	#5	3,768 sf
	DAN CA2	Danthonia californica	California Oatgrass	PLUGS	1,306
	DIP AUR	Diplacus aurantiacus	Sticky Monkeyflower	#1	73
	FES RE4	Festuca rubra	Red Fescue	PLUGS	1,306
	FRA CA3	Frangula californica	California Buckthorn	#5	27
	MON VIL	Monardella villosa	Coyote Mint	PLUGS	10,444
	RIB CH2	Ribes malvaceum	Chaparral Currant	#5	16
	RIB SA2	Ribes sanguineum	Red Flowering Currant	#5	11
	RIB SPE	Ribes speciosum	Fuchsia Flowering Gooseberry	#5	19
	SAL SON	Salvia sonomensis	Creeping Sage	#1	54

		FLOODPLAIN UNDERSTORY			11,416 sf
	CAR DE2	Carex densa	Dense Sedge	PLUGS	445
	CAR NU2	Carex nudata	California Black-flowering Sedge	PLUGS	149
	CYP ER2	Cyperus eragrostis	Tall Umbrella Sedge	PLUGS	149
	FES RE3	Festuca rubra	Red Fescue	PLUGS	445
	HOR BR2	Hordeum brachyantherum	Meadow Barley	PLUGS	149
	LUP RIV	Lupinus rivularis	Riverbank Lupine	#1	60
	PET PAL	Petasites frigidus palmatus	Arctic Sweet Colts Foot	#1	23
	ROS GY2	Rosa gymnocarpa	Dwarf Rose	#1	24
	ROS NU2	Rosa nutkana	Nootka Rose	#1	19
	RUB UR2	Rubus ursinus	California Blackberry	#1	19
	STA AJU	Stachys ajugoides	Bugle Hedgenettle	#1	66
	VIT CA2	Vitis californica	California Wild Grape	#1	6
		UPPER RIPARIAN SHRUBS			6,176 sf
	BER AQ2	Berberis aquifolium	Oregon Grape	#5	18
	CAL OC2	Calycanthus occidentalis	Spice Bush	#5	16
	PHY CA3	Physocarpus capitatus	Pacific Ninebark	#5	6
	ROS CA2	Rosa californica	California Wild Rose	#1	21
	ROS NUT	Rosa nutkana	Nootka Rose	#1	9

PLANT SCHEDULE

PRELIMINARY

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ALLEN PARK
PRELIMINARY PLANTING PLAN W/O FLOODWALL SETBACKS
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Appendix B

Tree Removal Table and Landscaping Planting Plans

Tree Removal Table

Frederick Allen Park Planting Plans

Lower Corte Madera Creek Planting Plan

LEGEND

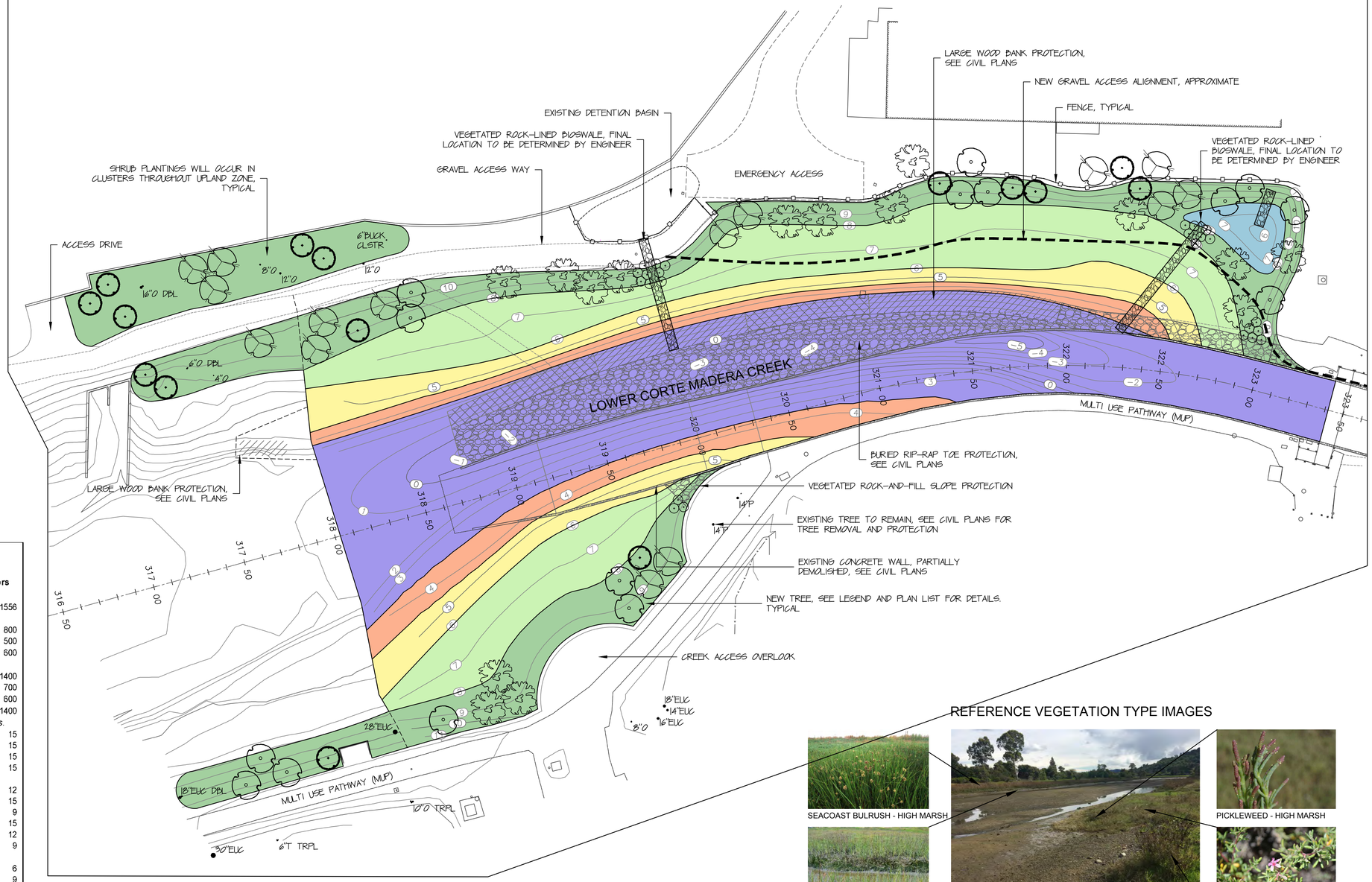
- PROPOSED CONTOURS
- CORTE MADERA CREEK RIGHT OF WAY
- PROPERTY LINE
- SURVEY CONTROL POINT
- SURVEY TOPO POINT (ELEV., DESCR)
- EXISTING EDGE OF PAVEMENT
- EXISTING EDGE OF GRAVEL PATH
- EXISTING BUILDING LINE (FROM MARINMAP GIS, APPROX.)
- 12"A — EXISTING LIVE TREE
  - COAST LIVE OAK
  - VALLEY OAK
  - BUCKEYE
  - BOX ELDER
  - WILLOW

NOTES:
1. RIP BANK SUBSOIL TO 6" DEPTH, 2 PASSES DIAGONAL RIP.
2. ADD 6" TO 9" TOPSOIL TRACKED WALKED 2 PASSES. TO APPROX. 85-87% RELATIVE COMPACTION TO ACHIEVE A TOP SOIL LAYER FOR PLANTING.
3. IF TOPSOIL IS NOT AVAILABLE PLACE 2" THICK COMPOST LAYER ON BANK, TILL IN TO A DEPTH OF 9" AND TRACK WALK 2 PASSES
4. COVER BANK WITH CJ2BN EROSION CONTROL BLANKET, COVER WITH 700 GRAM COIR MAT. PINNED 24" ON CENTER WITH 18" WOOD WEDGE STAKES.
5. UPPER BANK ABOVE ELEVATION 7 TO BE SEED WITH NATIVE SEED MIX, SEE PLANT LIST
6. SHRUB PLANTINGS WILL OCCUR IN CLUSTERS THROUGHOUT UPLAND ZONE

PLANT LIST

Zone/ Revegetation Strategy	Common Name	Latin Name	Container Size (minimum)[1]	Spacing (Feet on center)	Plant Numbers
Low Marsh: *Plant within coir fabric for erosion control.*					
	California cordgrass[2]	*Spartina foliosa*	Stubby Cell	1.5	1556
High Marsh: *Plant within upper portion of zone; allow remainder to establish naturally.*					
	pickleweed	*Salicornia pacifica*	transplant	1.5	800
	seacoast bulrush	*Bulboschoenus maritimus*	Stubby Cell	1.5	500
	fleshy jaumea	*Jaumea carnosa*	RP	1.5	600
Transition Zone: *Plant within upper portion of zone; allow remainder to establish naturally.*					
	alkali heath	*Frankenia salina*	D16	1.5	1400
	gumplant	*Grindelia stricta*	D40 or 1 gal	1.5	700
	marsh lavender	*Limonium californicum*	RP	1.5	600
	salt grass	*Distichlis spicata*	LT6	1.5	1400
Upland: *Locate trees and shrubs in clusters for habitat value as well as shade and views for park users.*					
Trees	boxelder	*Acer negundo*	TP4	15	15
	buckeye	*Aesculus californicus*	TP4	15	15
	coast live oak	*Quercus agrifolia*	TP4	15	15
	valley oak	*Quercus lobata*	TP4	15	15
Shrubs	coastal sagebrush	*Artemisia californica*	D16	4	12
	coffeberry	*Frangula californica*	D40	6	15
	coyote brush	*Baccharis pilularis*	D40	6	9
	snowberry	*Symphoricarpos mollis*	D40	6	15
	sticky monkeyflower	*Mimulus aurantiacus*	D40	4	12
	toyon	*Heteromeles arbutifolia*	D40	6	9
Detention Basin					
Shrubs	arroyo willow	*Salix lasiolepis*	cutting	8	6
	California rose	*Rosa californica*	D40	6	9
Herbaceous	mugwort	*Artemisia californica*	D16	1.5	9
	western goldenrod	*Euthamia occidentalis*	D16	1.5	9
	bee plant	*Scrophularia californica*	D16	1.5	5
	wire rush	*Juncus balticus*	Stubby Cell	1.5	25
	creeping wildrye	*Leymus triticoides*	Stubby Cell	1.5	25
Vegetated Rock-and-Fill Slope Protection					
Shrubs	arroyo willow	*Salix lasiolepis*	cutting	5	25
Seed Mixes: *40 lbs PLS/ac, applied to disturbed areas >7' elev.*			*% Composition by Weight*		
Upland	blue wildrye	*Elymus glaucus*	40%		
	CA brome	*Bromus carinatus*	40%		
	sky lupine	*Lupinus nanus*	5%		
	small fescue	*Festuca microstachys*	10%		
	yarrow	*Achillea millefolium*	5%		
Detention Basin	meadow barley	*Hordeum brachyantherum*	50%		
	creeping wildrye	*Leymus triticoides*	30%		
	California brome	*Bromus carinatus*	10%		
	small fescue	*Festuca microstachys*	10%		

[1] *Marsh and transition zone species may be planted from salvage or transplants to the extent available.*
[2] *Coordinate with Invasive Spartina Project on selection of appropriate native material.*



REVEGETATION LEGEND AND ZONES

ZONE	DESCRIPTION	AREA	ELEVATION RANGE CURRENT	FORECAST ELEVATION RANGE 2050 (ASSUMES 1.5' SLR)	FORECAST ELEVATION RANGE 2100 (ASSUMES 3' SLR)
	APPROX. MEAN SEA LEVEL	26,700 SF	3.5'	5'	6.5'
	INTERTIDAL MUDFLAT/BIOTECHNICAL PROTECTION NO PLANTING	3,700 SF	2'-3.5'		
	LOW MARSH	7,000 SF	3.5'-4.5'	5'-6'	6.5'-7.5'
	HIGH MARSH	8,700 SF	4.5'-6'	6'-7.5'	7.5'-9'
	TRANSITION ZONE	18,500 SF	6'-8'	7.5'-9.5'	9'-11'
	UPLAND	23,300 SF	>8'	>9.5'	>11'
	SWALE / DETENTION BASIN	1,100 SF	N/A	N/A	N/A

REFERENCE VEGETATION TYPE IMAGES

SEACOAST BULRUSH - HIGH MARSH

CA CORDGRASS - LOW MARSH

MARSH ZONES AND MUDFLAT

PICKLEWEED - HIGH MARSH

ALKALI HEATH - TRANSITION ZONE

GUMPLANT - TRANSITION ZONE

UPLAND AND SWALE

N

0 15 30 60

VERIFY SCALES
ONE INCH

PRUNUSKE CHATHAM, INC.
400 MORRIS STREET, SUITE G
SEBASTOPOL, CA 95472
(707) 824-8600

PREPARED FOR:
FRIENDS OF CORTE MADERA CREEK WATERSHED
PO BOX 415
LARKSPUR CA 94977

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REVISIONS	DATE	BY

DATE: NOV 2020
SCALE: 1"=30'
MAPPING BY:
DESIGNED BY: JS
DRAFTED BY: FW
CHECKED BY: MJ

REVEGETATION PLAN

LOWER CORTE MADERA CREEK CONCRETE CHANNEL REMOVAL PROJECT

SHEET
29

Acad File Name:G:\Acad Dwgs CIV3D\Friends of Corte Madera Creek\Dwgs\RP1.dwg
Plot date:11/23/2020 1:14 PM Layout:REVEGETATION PLAN

Appendix C

Air Quality Supporting Information

Air Quality Emissions Assumptions and Calculations

CalEEMod Emissions Model Results

Health Risk Assessment

Schedule

Phase	Construction Phase	Start Date	End Date	Approximate Demolition Duration	Approximate Grading Duration (Work Days)	Approximate Building Duration	Approximate Paving Duration	Approximate Planting Duration	Approximate Duration (Work Days)	Total Approximate Duration (Active Construction Excluding Planting)	Notes	Operations	
1	Lower Channel Concrete Removal	8/8/2022	10/12/2022	15	30	0	0	32	72	40			
		10/31/2022	12/1/2022							0			
2	Flood Wall (Segment #1) Construction	4/1/2022	7/7/2022	5	5	50	10	0	70	70			
3	Flood Wall (Segment #2) Construction	7/8/2022	8/25/2022	5	5	15	10	0	35	35			
4	Flood Wall (Segment #3) Construction	4/1/2022	7/14/2022	5	10	50	10	0	75	75			
5	Fish Pool Construction	6/15/2022	10/11/2022	25	25	0	65	0	85	85	These tasks overlap in the schedule, total days 85		
6	Granton Park Storm Drain Pump Station Construction	4/1/2022	5/26/2022	5	10	15	10	1	40	39		40 HP (29.8 kW) Pumps; 150-kW (201 hp) backup generator 50 hrs/yr	502 kWhr per year
7	Allen Park Construction	6/1/2022	10/25/2022	25	50	45	20	20	105	85	These tasks overlap in the schedule, total days 105		
8	Unit 4 Improvements	6/15/2022	8/30/2022	5	35	10	10	5	55	50	These tasks overlap in the schedule, total days 55		

Total	4/1/2022	10/25/2022	10/31/2022	12/1/2022
	Total	167		

Table 1 - Cut and Fill Details

Construction Phase	Total Disturbed Area (acre)	Total Disturbed Area (sf)	Total Paved (Concrete) Area (sf)	Total Volume Cut Generated (cy) - below OHWM Only	Total Volume Cut Generated (cy)	Total Volume Fill (cy) - Below OHWM	Total Volume Fill (cy) (Native Soil)	Total Volume Fill (cy) (Rock)	Total Volume Fill (cy) (Concrete)
Lower Channel Concrete Removal	1.98	86,250	0	N/A	7,250	N/A	0	1,025	0
Flood Wall (Segment #1) Construction	0.13	5,700	950	0	370	0	150	70	160
Flood Wall (Segment #2) Construction	0.01	390	65	0	25	0	10	5	11
Flood Wall (Segment #3) Construction	0.15	6,500	1,100	0	420	0	160	80	180
Fish Pool Construction	0.11	5,000	5,000	Unknown	650	Unknown	0	100	350
Granton Park Storm Drain Pump Station Construction	0.04	1,900	520	0	2,800	0	1,400	20	110
Allen Park Construction	1.38	60,000	6,400	Unknown	Total: 8,900 Conc. Channel: 400 Right Bank: 7,550 Left Bank: 950	Unknown	Total: 1,350 Conc. Channel: 1,300 Right Bank: 25 Left Bank: 25	0	650
Unit 4 Improvements	0.23	10,000	3,625	1,500	1,500	1,425	750	450	225
Total		**175,740**			**32,415**		**5,070**	**1,750**	**1,686**

Note: for "Lower Channel Concrete Removal" the volume of cut includes the volume of rock fill

The "Lower Channel Concrete Removal" volume of cut was reduced to 7,225 per the 65% plan

Project assumptions are based on preliminary engineering and subject to change. The majority of the Lower Channel Concrete Removal assumptions are from the 30% design plan. The 65% design plan yielded smaller areas of effect.

Note: for "Lower Channel Concrete Removal" the rock fill is taken from the edges of the stilling

Table 2 - Construction Water

Construction Phase	Approximate Grading Duration (Work Days)	Total Disturbed Area (sf)	Total Disturbed Area (Acre)	Required Water (Gal)
Lower Channel Concrete Removal	30	86,250	1.9800	269,085
Flood Wall (Segment #1) Construction	5	5,700	0.1309	2,964
Flood Wall (Segment #2) Construction	5	390	0.0090	203
Flood Wall (Segment #3) Construction	10	6,500	0.1492	6,760
Fish Pool Construction	25	5,000	0.1148	12,999
Granton Park Storm Drain Pump Station Construction	10	1,900	0.0436	1,976
Allen Park Construction	50	60,000	1.3774	311,982
Unit 4 Improvements	35	10,000	0.2296	36,398
				642,366

3020 gal/acre application rate
3 applications per day
0.5 portion of project duration requiring dust control

Water usage for dust control is calculated based on a minimum control efficiency of 66% (three times daily) with an application rate of 3,020 gal/acre/day
(Air & Waste Management Association Air Pollution Engineering Manual (1992 Edition))

Table 3 - Worker Trip Details

	Worker				Water		Earthwork				Demo (concrete, fencing, vegetation and miscellaneous)										Concrete			Equipment		MHDT Total		HHDT Total	
Construction Phase	Average Number of Workers Per Day (Active Construction)	Average One-Way Worker Trips per Day	Average Number of Workers Per Day (Planting)	Average One-Way Worker Trips per Day	Total Water Trucks (4,000 gallons)	Average One-Way Water Trucks per Day	Total Export/Import (solid cy)	Total Export/Import (loose cy)	Total Number of 16 cy Haul trucks ONLY	Average One-Way Truck Trips per Day (16 cy Haul trucks ONLY)	Total Concrete Demo (solid cy)	Total Concrete Demo (loose cy)	Total Concrete Weight (tons)	Concrete Area (sf)	Tree Removal	Tree Removal (loose cy)	Fence Removal (ft)	Fence Removal (loose cy)	Total Demo (loose cy)	Total Number of 16 cy Haul trucks ONLY	Average One-Way Truck Trips per Day (16 cy Haul trucks ONLY)	Total Concrete (cy)	Total Number of 9 cy trucks	Average One-Way Truck Trips per Day (9 cy Haul trucks ONLY)	Total Number of Trips	Average One-Way Truck Trips per Day	Total Concrete and Water Trucks	Average One-Way Truck Trips per Day (Water and Concrete)	Total Haul and Equipment Delivery Trucks	Average One-Way Truck Trips per Day (Haul and Equipment
Lower Channel Concrete Removal	6	12	4	8	136	6.8	6,225	7470	467	23.4	220	286	446	5,700	39	78	1,250	125	489	31	1.6	0	0	0.0	10	0.5	136	7	508	25
Flood Wall (Segment #1) Construction	6	12	0	0	2	0.1	290	348	22	0.6	0	0	0	0	71	142	950	95	237	15	0.4	160	18	0.5	10	0.3	20	1	65	2
Flood Wall (Segment #2) Construction	6	12	0	0	2	0.1	20	25	2	0.1	0	0	0	0	3	6	0	0	6	1	0.1	11	1	0.1	10	0.6	3	0	14	1
Flood Wall (Segment #3) Construction	6	12	0	0	0	0.0	340	408	26	0.7	0	0	0	0	83	166	1,075	108	274	18	0.5	180	20	0.5	10	0.3	20	1	74	2
Fish Pool Construction	4	8	0	0	8	0.2	750	900	57	1.3	350	455	709	5,000	0	0	0	0	455	29	0.7	350	39	0.9	10	0.2	47	1	135	3
Granton Park Storm Drain Pump Station Construction	6	12	4	8	2	0.1	1,420	1704	107	5.5	0	0	0	0	8	16	0	0	16	1	0.1	110	12	0.6	10	0.5	14	1	130	7
Allen Park Construction	6	12	4	8	156	3.7	7,550	9060	567	13.3	1,200	1,560	2,430	32,000	144	288	1,200	120	1,968	123	2.9	650	72	1.7	10	0.2	228	5	772	18
Unit 4 Improvements	4	8	4	8	20	0.8	1,200	1440	90	3.6	0	0	0	0	21	42	0	0	42	3	0.1	225	25	1.0	10	0.4	45	2	128	5
Total							**17795.5**	**21354.6**			**1770.0**	**2301.0**			369.0	**738.0**		**447.5**	**3486.5**											

Note: one-way trips multiple the number of trucks needed by two to account for arriving with the load and leaving empty/arriving empty and leaving with l Note: for "Lower Channel Concrete Removal" the rock f Note: Used loose instead of solid.

Assume hauling to Redwood Landfill

Average trips for "Lower Channel Concrete Removal", "Allen Park Construction", "Granton Park", and "Unit 4" are for active construction, excluding planting periods.

Project assumptions are based on preliminary engineering and subject to change. The majority of the Lower Channel Concrete Removal assumptions are from the 30% design plan. The 65% design plan yielded smaller areas of effect.

Parameters Used in Calculations		
Soils Bulking Solid to Loose	1.20	multiplier
Concrete Demo Bulking Solid to Loose	1.30	multiplier
Tree Removal Volume Average	2.00	cy (chipped)
Fence Demo Length to Volume	0.10	cy (loose in truck)
Truck Volume (no trailer)	16	cy
Concrete Truck Volume	9	cy
Average Truck Loading/Unloading Time	0.5	hours
Average Concrete Truck Pour Time	1.0	hours
Hours Per Day Loading	8	hours
Time for One Way Trip to Disposal Site	1	hours
Haul TruckTrips Per Day	16	round trip
Haul TruckTrips Per Day	32	one way
Concrete TruckTrips Per Day	6	round trip
Concrete TruckTrips Per Day	12	one way equipment deliveries
Equipment Mob/Demob	10	per phase

Table 4 - Construction Equipment

Construction Phase	Construction Equipment Type	Construction Fuel Type	Number	Horsepower of Equipment	Hours of use over Demolition	Hours of use over Grading	Hours of use over Construction	Hours of use over Paving
Lower Channel Concrete Removal								
CAT 320 Excavator	Excavator (Medium)	Diesel	1	120	6.00	5.00		
Pickup Truck	Pickup Truck	Gas	2	290				
Utility/Large Pickup Truck	Pickup Truck Large	Diesel	1	330				
Dewatering Pump	Pump	Diesel	1	44	24.00	20.00		
Super 10 Truck	Dump Truck	Diesel	3	550	8.00	6.67		
CAT 120 Motor Grader	Grader	Diesel	1	140	0.00	2.00		
Liebherr LTR 1060 Crawler Crane	Crane	Diesel	1	175	2.67	0.00		
Giken F101 Hammer	Silent Piler	Diesel	1	355	5.33	0.00		
Flood Wall (Segment #1) Construction								
CAT 226D3 Skid Steer	Loader	Diesel	1	67.1	4.00	4.00	2.40	0.00
CAT 303 Excavator	Excavator (Small)	Diesel	1	25	4.00	4.00	2.40	0.00
Pickup Truck	Pickup Truck	Gas	2	290				
Utility/Large Pickup Truck	Pickup Truck Large	Diesel	1	330				
Cement truck and mixer	Cement truck and mixer	Diesel	1	500	0.00	0.00	0.00	2.50
Putzmeister 47Z Boom Pump	Concrete boom pump	Diesel	1	550	0.00	0.00	0.00	2.50
Super 10 Truck	Dump Truck	Diesel	2	550	6.00	6.00	1.20	0.00
Flood Wall (Segment #2) Construction								
CAT 226D3 Skid Steer	Loader	Diesel	1	67.1	4.00	4.00	2.67	0.00
CAT 303 Excavator	Excavator (Small)	Diesel	1	25	4.00	4.00	2.67	0.00
Pickup Truck	Pickup Truck	Gas	2	290				
Utility/Large Pickup Truck	Pickup Truck Large	Diesel	1	330				
Cement truck and mixer	Cement truck and mixer	Diesel	1	500	0.00	0.00	0.00	2.50
Putzmeister 47Z Boom Pump	Concrete boom pump	Diesel	1	550	0.00	0.00	0.00	2.50
Super 10 Truck	Dump Truck	Diesel	2	550	6.00	6.00	4.00	0.00
Flood Wall (Segment #3) Construction								
CAT 226D3 Skid Steer	Loader	Diesel	1	67.1	4.00	4.00	2.40	0.00
CAT 303 Excavator	Excavator (Small)	Diesel	1	25	4.00	4.00	2.40	0.00
Pickup Truck	Pickup Truck	Gas	2	290				
Utility/Large Pickup Truck	Pickup Truck Large	Diesel	1	330				
Cement truck and mixer	Cement truck and mixer	Diesel	1	500	0.00	0.00	0.00	5.00
Putzmeister 47Z Boom Pump	Concrete boom pump	Diesel	1	550	0.00	0.00	0.00	5.00

Super 10 Truck	Dump Truck	Diesel	2	550	6.00	6.00	0.60	0.00
Fish Pool Construction								
CAT 226D3 Skid Steer	Loader	Diesel	1	67.1	4.00	3.20		0.00
CAT 320 Excavator	Excavator (Medium)	Diesel	1	120	6.00	4.80		0.00
Pickup Truck	Pickup Truck	Gas	2	290				
Utility/Large Pickup Truck	Pickup Truck Large	Diesel	1	330				
Cement truck and mixer	Cement truck and mixer	Diesel	1	500	0.00	0.00		1.54
Putzmeister 47Z Boom Pump	Concrete boom pump	Diesel	1	550	0.00	0.00		1.54
Dewatering Pump	Pump	Diesel	2	44	24.00	24.00		12.92
Super 10 Truck	Dump Truck	Diesel	2	550	1.80	1.80		0.00
Granton Park Storm Drain Pump Station Construction								
CAT 320 Excavator	Excavator (Medium)	Diesel	1	120	6.00	6.00	2.00	0.00
Pickup Truck	Pickup Truck	Gas	2	290				
Utility/Large Pickup Truck	Pickup Truck Large	Diesel	1	330				
Cement truck and mixer	Cement truck and mixer	Diesel	1	500	0.00	0.00	0.00	2.50
Putzmeister 47Z Boom Pump	Concrete boom pump	Diesel	1	550	0.00	0.00	0.00	2.50
Leibherr Small Crane LTC 1050-3.1	Crane	Diesel	1	326	0.00	0.00	0.00	3.00
Super 10 Truck	Dump Truck	Diesel	2	550	6.00	3.00	2.00	0.00
Dewatering Pump	Pump	Diesel	1	44	24.00	24.00	16.00	0.00
Allen Park Construction								
CAT 226D3 Skid Steer	Loader	Diesel	1	67.1	2.67	1.33	1.48	0.00
CAT 320 Excavator	Excavator (Medium)	Diesel	1	120	3.20	1.60	1.78	0.00
Pickup Truck	Pickup Truck	Gas	2	290				
Utility/Large Pickup Truck	Pickup Truck Large	Diesel	1	330				
Cement truck and mixer	Cement truck and mixer	Diesel	1	500	0.00	0.00	0.00	1.00
Putzmeister 47Z Boom Pump	Concrete boom pump	Diesel	1	550	0.00	0.00	0.00	1.00
CAT CB22B Small Roller	Roller/Compactor	Diesel	1	36.2	0.00	0.00	0.00	4.00
Super 10 Truck	Dump Truck	Diesel	3	550	3.20	1.60	2.67	0.00
Dewatering Pump	Pump	Diesel	1	44	24.00	24.00	2.67	0.00
CAT 120 Motor Grader	Grader	Diesel	1	140	3.60	1.80	0.00	0.00
Unit 4 Improvements								
CAT 320 Excavator	Excavator (Medium)	Diesel	1	120	8.00	1.43	5.00	0.00
Pickup Truck	Pickup Truck	Gas	2	290				
Utility/Large Pickup Truck	Pickup Truck Large	Diesel	1	330				
Cement truck and mixer	Cement truck and mixer	Diesel	1	500	0.00	0.00	0.00	5.00
Putzmeister 47Z Boom Pump	Concrete boom pump	Diesel	1	550	0.00	0.00	0.00	5.00
Dewatering Pump	Pump	Diesel	1	44	24.00	24.00	24.00	12.00
Super 10 Truck	Dump Truck	Diesel	3	550	10.67	1.52	5.33	0.00

Total Criteria Air Pollutants Unmitigated

		pounds								metric tons	
	Construction Phase	**ROG**	**NOx**	**CO**	**SO2**	**Exhaust PM10**	**Dust/Fugitive PM10**	**Exhaust PM2.5**	**Dust/Fugitive PM2.5**	**CO2e**	**Amortized**
1	**Lower Channel Concrete Removal**										
	Truck Emissions	16.83	348.55	176.04	1.07	9.37	125.16	4.91	30.72	8.9	
	Equipment and Worker Trip Emissions	65.40	447.60	492.80	0.94	19.10	20.40	18.52	4.02	38.0	
	Total	82.23	796.15	668.84	2.01	28.47	145.56	23.43	34.74	46.9	1.6
2	**Flood Wall (Segment #1) Construction**										
	Truck Emissions	4.44	59.26	39.83	0.22	2.74	47.98	1.38	11.78	4.9	
	Equipment and Worker Trip Emissions	11.04	69.80	90.60	0.26	2.82	9.42	2.68	2.48	12.2	
	Total	15.48	129.06	130.43	0.48	5.56	57.40	4.06	14.26	17.2	0.6
3	**Flood Wall (Segment #2) Construction**										
	Truck Emissions	1.84	22.75	14.86	0.10	1.43	23.65	0.72	5.80	3.2	
	Equipment and Worker Trip Emissions	7.56	51.00	56.60	0.18	1.92	4.64	1.84	1.24	9.0	
	Total	9.40	73.75	71.46	0.28	3.35	28.29	2.56	7.04	12.2	0.4
4	**Flood Wall (Segment #3) Construction**										
	Truck Emissions	4.87	65.63	44.02	0.24	2.95	51.81	1.49	12.72	5.2	
	Equipment and Worker Trip Emissions	12.88	104.60	98.60	0.30	3.98	1.32	3.82	0.32	15.1	
	Total	17.75	170.23	142.62	0.54	6.93	53.13	5.31	13.04	20.3	0.7
5	**Fish Pool Construction**										
	Truck Emissions	6.91	106.21	64.56	0.36	3.97	65.35	2.02	16.04	5.9	
	Equipment and Worker Trip Emissions	171.40	1,118.60	1,182.80	2.34	44.40	25.40	44.00	5.02	94.7	
	Total	178.31	1,224.81	1,247.36	2.70	48.37	90.75	46.02	21.06	100.5	3.4
6	**Granton Park Storm Drain Pump Station Construction**										
	Truck Emissions	5.00	89.55	51.00	0.29	2.66	41.35	1.37	10.15	2.9	
	Equipment and Worker Trip Emissions	37.00	248.60	265.80	0.56	9.96	5.60	9.76	1.44	23.0	
	Total	42.00	338.15	316.80	0.85	12.62	46.95	11.13	11.59	25.9	0.9
7	**Allen Park Construction**										
	Truck Emissions	25.38	511.32	269.25	1.56	13.09	184.41	6.83	45.26	10.6	
	Equipment and Worker Trip Emissions	115.60	756.60	839.00	1.54	32.60	73.80	31.80	13.44	61.6	
	Total	140.98	1,267.92	1,108.25	3.10	45.69	258.21	38.63	58.70	72.2	2.4
8	**Unit 4 Improvements**										
	Truck Emissions	5.62	99.24	55.30	0.33	3.44	52.18	1.77	12.81	5.0	
	Equipment and Worker Trip Emissions	77.00	499.60	526.00	1.06	19.64	5.98	19.48	1.56	43.6	
	Total	82.62	598.84	581.30	1.39	23.08	58.16	21.25	14.37	48.6	1.6
	Total	568.76	4,598.90	4,267.07	11.36	174.07	738.45	152.38	174.80		
	Average Daily	**3.41**	**27.54**	**25.55**	**0.07**	**1.04**	**4.42**	**0.91**	**1.05**	**343.8**	**11.5**

	Operational Facility	**ROG**	**NOx**	**CO**	**SO2**	**Exhaust PM10**	**Dust/Fugitive PM10**	**Exhaust PM2.5**	**Dust/Fugitive PM2.5**	**CO2e**	
6	**Granton Park Storm Drain Pump Station Construction**										
	Equipment Emissions	16.6	46.2	42	0.08	2.42	0	2.42	0	17.7	
	Average Daily	**0.05**	**0.13**	**0.12**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**17.7**	**29.1**
							0.01		0.01		

1 lb = 0.00045 metric ton

1 ton = 2000 pounds

1 lb = 0.0005 ton 0.000454 metric ton

						Running Emissions for the Associated Year (Pounds/mile)									Process Emissions for the Associated Year (Pounds/trip)							Total Emissions (Pounds/year)								
Phase	Truck Type	Number	Total Days of Use within the Phase	Total Trip Distance	Total One-Way Trips	ROG	NOx	CO	SO2	Exhaust PM10	Dust PM10	Exhaust PM2.5	Dust PM2.5	CO2e	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	CO2e	ROG	NOx	CO	SO2	Exhaust PM10	Dust PM10	Exhaust PM2.5	Dust PM2.5	CO2e
Lower Channel Concrete Removal	Pickup Truck	2	54	20	108	4.6901E-05	0.0002	0.002299	6.64636E-06	0.000103	0.003884	4.29922E-05	0.000953	0.613889	0.004334	0.00058	0.005544	1.41756E-06	5.43942E-06	5.00168E-06	0.151616	1.138843	0.990787	11.12839	0.029018	0.445508	16.77881	0.186806	4.118435	2684.751
Lower Channel Concrete Removal	Pickup Truck Large	1	20	20	40	0.00033574	0.003113	0.001446	1.284E-05	0.000275	0.003884	0.000140098	0.000953	1.290262	0.000242	0.004577	0.002006	4.47134E-06	6.2006E-05	5.93237E-05	0.449462	0.278273	2.673256	1.237142	0.010451	0.222091	3.107187	0.114451	0.762673	1050.188
Lower Channel Concrete Removal	Dump Truck	3	40	20	80	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.99791	28.24287	4.684569	0.108852	1.931218	18.64312	1.029434	4.576039	10943.2
Lower Channel Concrete Removal	Haul/Delivery Truck	1	--	20	1016	0.00018246	0.007752	0.000802	3.08534E-05	0.00029	0.003884	0.000151089	0.000953	0.007538	0.010093	0.141598	0.137528	0.000241646	7.97129E-05	7.62645E-05	0.05906	13.96215	301.3925	156.0255	0.872453	5.968167	78.92254	3.147618	19.3719	213.1675
Lower Channel Concrete Removal	Water Truck	1	--	7.3	272	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.452047	15.25268	2.968708	0.048448	0.805018	7.712037	0.431714	1.892955	4870.558
Total																						16.82922	348.5521	176.0443	1.069222	9.372001	125.1637	4.910024	30.722	19761.86
Flood Wall (Segment #1) Construction	Pickup Truck	2	70	20	140	4.6901E-05	0.0002	0.002299	6.64636E-06	0.000103	0.003884	4.29922E-05	0.000953	0.613889	0.004334	0.00058	0.005544	1.41756E-06	5.43942E-06	5.00168E-06	0.151616	1.476278	1.284353	14.4257	0.037617	0.57751	21.75031	0.242157	5.338712	3480.232
Flood Wall (Segment #1) Construction	Pickup Truck Large	1	55	20	110	0.00033574	0.003113	0.001446	1.284E-05	0.000275	0.003884	0.000140098	0.000953	1.290262	0.000242	0.004577	0.002006	4.47134E-06	6.2006E-05	5.93237E-05	0.449462	0.76525	7.351455	3.402141	0.02874	0.610749	8.544763	0.314741	2.097351	2888.018
Flood Wall (Segment #1) Construction	Cement/Water Truck	1	--	7.3	40	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.065739	2.218118	0.431724	0.007045	0.11707	1.121522	0.062782	0.275283	708.3001
Flood Wall (Segment #1) Construction	Dump Truck	2	20	20	40	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.332637	9.414289	1.561523	0.036284	0.643739	6.214373	0.343145	1.525346	3647.733
Flood Wall (Segment #1) Construction	Cement pump truck	1	5	7.3	10	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.016619	0.56076	0.109144	0.001781	0.029596	0.283531	0.015872	0.069594	179.0646
Flood Wall (Segment #1) Construction	Haul/Delivery Truck	1	--	20	130	0.00018246	0.007752	0.000802	3.08534E-05	0.00029	0.003884	0.000151089	0.000953	0.007538	0.010093	0.141598	0.137528	0.000241646	7.97129E-05	7.62645E-05	0.05906	1.780388	38.43216	19.89564	0.111251	0.761033	10.06383	0.401369	2.470213	27.18212
Total																						4.43691	59.26114	39.82587	0.222718	2.739697	47.97833	1.380066	11.7765	10930.53
Flood Wall (Segment #2) Construction	Pickup Truck	2	35	20	70	4.6901E-05	0.0002	0.002299	6.64636E-06	0.000103	0.003884	4.29922E-05	0.000953	0.613889	0.004334	0.00058	0.005544	1.41756E-06	5.43942E-06	5.00168E-06	0.151616	0.738139	0.642177	7.212848	0.018808	0.288755	10.87515	0.121078	2.669356	1740.116
Flood Wall (Segment #2) Construction	Pickup Truck Large	1	25	20	50	0.00033574	0.003113	0.001446	1.284E-05	0.000275	0.003884	0.000140098	0.000953	1.290262	0.000242	0.004577	0.002006	4.47134E-06	6.2006E-05	5.93237E-05	0.449462	0.347841	3.34157	1.546428	0.013064	0.277613	3.883983	0.143064	0.953341	1312.735
Flood Wall (Segment #2) Construction	Cement/Water Truck	1	--	7.3	6	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.010649	0.359302	0.069933	0.001141	0.018964	0.18167	0.01017	0.044592	114.734
Flood Wall (Segment #2) Construction	Dump Truck	2	20	20	40	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.332637	9.414289	1.561523	0.036284	0.643739	6.214373	0.343145	1.525346	3647.733
Flood Wall (Segment #2) Construction	Cement pump truck	1	5	7.3	10	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.016619	0.56076	0.109144	0.001781	0.029596	0.283531	0.015872	0.069594	179.0646
Flood Wall (Segment #2) Construction	Haul/Delivery Truck	1	--	20	28	0.00018246	0.007752	0.000802	3.08534E-05	0.00029	0.003884	0.000151089	0.000953	0.007538	0.010093	0.141598	0.137528	0.000241646	7.97129E-05	7.62645E-05	0.05906	0.390382	8.426949	4.362481	0.024394	0.16687	2.206678	0.088008	0.541639	5.960173
Total																						1.836267	22.74505	14.86236	0.095472	1.425537	23.64539	0.721336	5.803868	7000.343
Flood Wall (Segment #3) Construction	Pickup Truck	2	75	20	150	4.6901E-05	0.0002	0.002299	6.64636E-06	0.000103	0.003884	4.29922E-05	0.000953	0.613889	0.004334	0.00058	0.005544	1.41756E-06	5.43942E-06	5.00168E-06	0.151616	1.581726	1.376093	15.4561	0.040303	0.618761	23.3039	0.259453	5.720048	3728.821
Flood Wall (Segment #3) Construction	Pickup Truck Large	1	60	20	120	0.00033574	0.003113	0.001446	1.284E-05	0.000275	0.003884	0.000140098	0.000953	1.290262	0.000242	0.004577	0.002006	4.47134E-06	6.2006E-05	5.93237E-05	0.449462	0.834818	8.019769	3.711426	0.031353	0.666272	9.32156	0.343354	2.288019	3150.565
Flood Wall (Segment #3) Construction	Cement/Water Truck	1	--	7.3	40	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.066478	2.243041	0.436575	0.007125	0.118385	1.134123	0.063487	0.278376	716.2585
Flood Wall (Segment #3) Construction	Dump Truck	2	20	20	40	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.332637	9.414289	1.561523	0.036284	0.643739	6.214373	0.343145	1.525346	3647.733
Flood Wall (Segment #3) Construction	Cement pump truck	1	6	7.3	12	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.019943	0.672912	0.130972	0.002137	0.035515	0.340237	0.019046	0.083513	214.8775
Flood Wall (Segment #3) Construction	Haul/Delivery Truck	1	--	20	148	0.00018246	0.007752	0.000802	3.08534E-05	0.00029	0.003884	0.000151089	0.000953	0.007538	0.010093	0.141598	0.137528	0.000241646	7.97129E-05	7.62645E-05	0.05906	2.033857	43.90363	22.72813	0.12709	0.869379	11.49659	0.458511	2.82189	31.05196
Total																						4.869458	65.62974	44.02473	0.244292	2.952051	51.81078	1.486997	12.71719	11489.31
Fish Pool Construction	Pickup Truck	2	75	20	150	4.6901E-05	0.0002	0.002299	6.64636E-06	0.000103	0.003884	4.29922E-05	0.000953	0.613889	0.004334	0.00058	0.005544	1.41756E-06	5.43942E-06	5.00168E-06	0.151616	1.581726	1.376093	15.4561	0.040303	0.618761	23.3039	0.259453	5.720048	3728.821
Fish Pool Construction	Pickup Truck Large	1	85	20	170	0.00033574	0.003113	0.001446	1.284E-05	0.000275	0.003884	0.000140098	0.000953	1.290262	0.000242	0.004577	0.002006	4.47134E-06	6.2006E-05	5.93237E-05	0.449462	1.182659	11.36134	5.257854	0.044416	0.943885	13.20554	0.486419	3.241361	4463.301
Fish Pool Construction	Cement/Water Truck	1	--	7.3	94	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.155853	5.258685	1.023525	0.016703	0.277547	2.658889	0.148843	0.652636	1679.228
Fish Pool Construction	Dump Truck	2	15	20	30	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.249477	7.060717	1.171142	0.027213	0.482804	4.66078	0.257359	1.14401	2735.8
Fish Pool Construction	Cement pump truck	1	10	7.3	20	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.033239	1.12152	0.218287	0.003562	0.059192	0.567062	0.031744	0.139188	358.1292
Fish Pool Construction	Haul/Delivery Truck	1	--	20	270	0.00018246	0.007752	0.000802	3.08534E-05	0.00029	0.003884	0.000151089	0.000953	0.007538	0.010093	0.141598	0.137528	0.000241646	7.97129E-05	7.62645E-05	0.05906	3.707361	80.02855	41.42935	0.231662	1.584723	20.95625	0.835785	5.143806	56.60222
Total																						6.910315	106.2069	64.55626	0.36386	3.966913	65.35242	2.019602	16.04105	13021.88
Granton Park Storm Drain Pump Station Construction	Pickup Truck	2	40	20	80	4.6901E-05	0.0002	0.002299	6.64636E-06	0.000103	0.003884	4.29922E-05	0.000953	0.613889	0.004334	0.00058	0.005544	1.41756E-06	5.43942E-06	5.00168E-06	0.151616	0.843587	0.733916	8.243255	0.021495	0.330006	12.42875	0.138375	3.050692	1988.704
Granton Park Storm Drain Pump Station Construction	Pickup Truck Large	1	20	20	40	0.00033574	0.003113	0.001446	1.284E-05	0.000275	0.003884	0.000140098	0.000953	1.290262	0.000242	0.004577	0.002006	4.47134E-06	6.2006E-05	5.93237E-05	0.449462	0.278273	2.673256	1.237142	0.010451	0.222091	3.107187	0.114451	0.762673	1050.188
Granton Park Storm Drain Pump Station Construction	Cement/Water Truck	1	--	7.3	28	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.047273	1.595051	0.310453	0.005066	0.084185	0.806488	0.045147	0.197956	509.3394
Granton Park Storm Drain Pump Station Construction	Dump Truck	2	15	20	30	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.249477	7.060717	1.171142	0.027213	0.482804	4.66078	0.257359	1.14401	2735.8
Granton Park Storm Drain Pump Station Construction	Cement pump truck	1	2	7.3	4	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.006648	0.224304	0.043657	0.000712	0.011838	0.113412	0.006349	0.027838	71.62585
Granton Park Storm Drain Pump Station Construction	Haul/Delivery Truck	1	--	20	260	0.00018246	0.007752	0.000802	3.08534E-05	0.00029	0.003884	0.000151089	0.000953	0.007538	0.010093	0.141598	0.137528	0.000241646	7.97129E-05	7.62645E-05	0.05906	3.579099	77.25985	39.99605	0.223647	1.529898	20.23124	0.80687	4.965849	54.64399
Total																						5.004357	89.54709	51.0017	0.288585	2.660822	41.34785	1.36855	10.14902	6410.302
Allen Park Construction	Pickup Truck	2	105	20	210	4.6901E-05	0.0002	0.002299	6.64636E-06	0.000103	0.003884	4.29922E-05	0.000953	0.613889	0.004334	0.00058	0.005544	1.41756E-06	5.43942E-06	5.00168E-06	0.151616	2.214417	1.92653	21.63854	0.056425	0.866265	32.62546	0.363235	8.008068	5220.349
Allen Park Construction	Pickup Truck Large	1	30	20	60	0.00033574	0.003113	0.001446	1.284E-05	0.000275	0.003884	0.000140098	0.000953	1.290262	0.000242	0.004577	0.002006	4.47134E-06	6.2006E-05	5.93237E-05	0.449462	0.417409	4.009884	1.855713	0.015676	0.333136	4.66078	0.171677	1.14401	1575.283
Allen Park Construction	Cement/Water Truck	1	--	7.3	456	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.758582	25.59559	4.981802	0.0813	1.350904	12.94161	0.724462	3.176576	8173.305
Allen Park Construction	Dump Truck	3	30	20	60	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.748432	21.18215	3.513427	0.081639	1.448413	13.98234	0.772076	3.432029	8207.399
Allen Park Construction	Cement pump truck	1	4	7.3	8	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.013296	0.448608	0.087315	0.001425	0.023677	0.226825	0.012697	0.055675	143.2517
Allen Park Construction	Haul/Delivery Truck	1	--	20	1544	0.00018246	0.007752	0.000802	3.08534E-05	0.00029	0.003884	0.000151089	0.000953	0.007538	0.010093	0.141598	0.137528	0.000241646	7.97129E-05	7.62645E-05	0.05906	21.22418	458.1535	237.1779	1.326235	9.072345	119.9719	4.784765	29.44766	324.0407
Total																						25.37632	511.3163	269.2547	1.5627	13.09474	184.4089	6.828912	45.26401	23643.63
Unit 4 Improvements	Pickup Truck	2	55	20	110	4.6901E-05	0.0002	0.002299	6.64636E-06	0.000103	0.003884	4.29922E-05	0.000953	0.613889	0.004334	0.00058	0.005544	1.41756E-06	5.43942E-06	5.00168E-06	0.151616	1.159933	1.009135	11.33448	0.029556	0.453758	17.08953	0.190266	4.194702	2734.468
Unit 4 Improvements	Pickup Truck Large	1	20	20	40	0.00033574	0.003113	0.001446	1.284E-05	0.000275	0.003884	0.000140098	0.000953	1.290262	0.000242	0.004577	0.002006	4.47134E-06	6.2006E-05	5.93237E-05	0.449462	0.278273	2.673256	1.237142	0.010451	0.222091	3.107187	0.114451	0.762673	1050.188
Unit 4 Improvements	Cement/Water Truck	1	--	7.3	90	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.149574	5.046842	0.982293	0.01603	0.266366	2.551777	0.142847	0.626345	1611.582
Unit 4 Improvements	Dump Truck	3	20	20	40	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.498955	14.12143	2.342284	0.054426	0.965609	9.32156	0.514717	2.288019	5471.599
Unit 4 Improvements	Cement pump truck	1	4	7.3	8	0.00019654	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000212766	0.000953	2.180331	0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.3996E-05	1.990048	0.013296	0.448608	0.087315	0.001425	0.023677	0.226825	0.012697	0.055675	143.2517
Unit 4 Improvements	Haul/Delivery Truck	1	--	20	256	0.00018246	0.007752	0.000802	3.08534E-05	0.00029	0.003884	0.000151089	0.000953	0.007538	0.010093	0.141598	0.137528	0.000241646	7.97129E-05	7.62645E-05	0.05906	3.518023	75.94142	39.31352	0.219831	1.50379	19.88599	0.793101	4.881108	53.7115
Total																						5.618053	99.2407	55.29703	0.331719	3.435291	52.18287	1.768079	12.80852	11064.8

CalEEMod Default Trip Distance

Activities	Uncontrolled Emission Factor PM10	Units	Controlled Emission Factor PM10	Units	Uncontrolled Emission Factor PM2.5	Units	Controlled Emission Factor PM2.5	Units	Source	Notes
Paved Roads - Average Weight of Vehicle	0.004	lb/VMT			0.0009	lb/VMT			AP-42, Section 13.2.1 Paved Roads	With Precipitation
	0.004	lb/VMT			0.0010	lb/VMT				Without Precipitation

Paved Roads Emission Factor Assumptions

0.0022	PM10 k Constant
0.00054	PM2.5 k Constant
2.4	Average Weight of Vehicle (CalEEMod)
0.7	silt content
0.5	moisture content
40	speed
15	speed
69	Days of Measurable Precipitation

Source: CalEEMod User's Guide, November 2017, page 39.

EMFAC2017 (v1.0.2) Emission Rates
Region Type: Air Basin
Region: SAN FRANCISCO BAY AREA
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN. Note 'day' in the unit is operation day.

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Populatio n	VMT	Trips	NOx_RUN EX	NOx_IDLE X	NOx_STRE UNEX	PM2.5_R EX	PM2.5_ID REX	PM2.5_ST MTW	PM2.5_P MBW	PM2.5_P NEX	PM10_RU EX	PM10_IDL REX	PM10_ST TW	PM10_PM BW	PM10_PM EX	CO2_RUN X	CO2_IDLE EX	CO2_STRE X	CH4_RUN EX	CH4_IDLE X	CH4_STRE X	N2O_RUN EX	N2O_IDLE X	N2O_STRE X	ROG_RUN EX	ROG_IDLE X	ROG_STR EX	ROG_HOT SOAK	ROG_RUN LOSS	ROG_RES TLOSS	ROG_DIU RN	TOG_RUN EX	TOG_IDLE X	TOG_STRE X	TOG_HOT SOAK	TOG_RUN LOSS	TOG_REST TLOSS	TOG_DIU RN	CO_RUNE X	CO_IDLEX	CO_STREX	SOx_RUN EX	SOx_IDLE X	SOx_STRE X
SAN FRANCISCO BAY AREA	2022	HHDT	Aggregated	Aggregated	GAS	29.96206	3525.498	599.481	3.383627	0	0.239477	0.000894	0	0.000537	0.005	0.02646	0.000973	0	0.000584	0.02	0.06174	2067.642	0	46.46973	0.087623	0	0.000284	0.136964	0	0.006667	0.424175	0	0.001484	0.10273	0.633341	0.025291	0.041523	0.618955	0	0.001624	0.10273	0.633341	0.025291	0.041523	33.08264	0	4.673482	0.020461	0	0.00046
SAN FRANCISCO BAY AREA	2022	HHDT	Aggregated	Aggregated	DSL	36411.82	4387801	381736.1	3.516434	62.13251	2.095419	0.033594	0.034593	0	0.008868	0.026071	0.035113	0.036157	0	0.035471	0.060832	1481.329	11601.89	0	0.003844	0.212645	0	0.232844	1.823656	0	0.082761	4.57818	0	0	0	0	0	0	0.094217	5.211909	0	0	0	0	0	0	0.36379	62.38175	0	0.013995	0.109609	0
SAN FRANCISCO BAY AREA	2022	HHDT	Aggregated	Aggregated	NG	1474.737	60117.65	5751.476	1.452968	20.66952	0	0.004631	0.025907	0	0.009	0.02646	0.00484	0.027079	0	0.036	0.06174	3154.725	4010.504	0	3.427411	1.230105	0	0.643111	0.817567	0	0.138155	0.039366	0	0	0	0	0	0	3.59954	1.280239	0	0	0	0	0	0	10.81333	21.21205	0	0	0	0
SAN FRANCISCO BAY AREA	2022	LDA	Aggregated	Aggregated	GAS	2686834	96209643	12626774	0.039976	0	0.203316	0.001345	0	0.001766	0.002	0.01575	0.001463	0	0.00192	0.008	0.03675	261.9798	0	55.69903	0.002442	0	0.055888	0.004526	0	0.026992	0.009477	0	0.255132	0.106752	0.229142	0.186208	0.200436	0.013825	0	0.279336	0.106752	0.229142	0.186208	0.200436	0.631395	0	2.377849	0.002593	0	0.000551
SAN FRANCISCO BAY AREA	2022	LDA	Aggregated	Aggregated	DSL	30412.67	1098266	142471.5	0.086676	0	0	0.007759	0	0	0	0.002	0.01575	0.00811	0	0	0.008	0.03675	209.048	0	0	0.000738	0	0	0.032859	0	0	0.015891	0	0	0	0	0	0	0.018091	0	0	0	0	0	0	0.229114	0	0.001976	0	0	0
SAN FRANCISCO BAY AREA	2022	LDA	Aggregated	Aggregated	ELEC	75024.53	2827913	368430.8	0	0	0	0	0	0	0.002	0.01575	0	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.004102	0.015297	0	0	0	0.004888	0	0.004102	0.015297	0	0	0	0	0	0
SAN FRANCISCO BAY AREA	2022	LDT1	Aggregated	Aggregated	GAS	291836.7	9811542	1346181	0.090871	0	0.263204	0.001751	0	0.002269	0.002	0.01575	0.001904	0	0.002467	0.008	0.03675	304.6484	0	64.97666	0.004893	0	0.073331	0.007247	0	0.029457	0.021274	0	0.365848	0.183398	0.669177	0.342141	0.405488	0.031025	0	0.400556	0.183398	0.669177	0.342141	0.405488	1.042717	0	2.514924	0.003015	0	0.000643
SAN FRANCISCO BAY AREA	2022	LDT1	Aggregated	Aggregated	DSL	179.6275	2983.899	594.982	1.097369	0	0	0.146284	0	0	0	0.002	0.01575	0.152899	0	0	0.008	0.03675	423.7455	0	0	0.00897	0	0	0.066607	0	0	0.193121	0	0	0	0	0.219855	0	0	0	0	0	0	0	1.149032	0	0	0.004006	0	0
SAN FRANCISCO BAY AREA	2022	LDT1	Aggregated	Aggregated	ELEC	2095.348	83054.91	10470.17	0	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.004018	0.014991	0	0	0	0.004888	0	0.004018	0.014991	0	0	0	0	0	0
SAN FRANCISCO BAY AREA	2022	LDT2	Aggregated	Aggregated	GAS	941211	32166990	4393961	0.074054	0	0.300318	0.001347	0	0.001705	0.002	0.01575	0.001465	0	0.001854	0.008	0.03675	329.5885	0	71.2272	0.003566	0	0.072793	0.006317	0	0.033519	0.014386	0	0.341226	0.126095	0.436122	0.272094	0.273586	0.020986	0	0.373599	0.126095	0.436122	0.272094	0.273586	0.820976	0	2.957346	0.003262	0	0.000705
SAN FRANCISCO BAY AREA	2022	LDT2	Aggregated	Aggregated	DSL	6657.914	256078	32491.02	0.042649	0	0	0.004968	0	0	0	0.002	0.01575	0.005192	0	0	0.008	0.03675	284.4136	0	0	0.000708	0	0	0.044706	0	0	0.015248	0	0	0	0	0.017358	0	0	0	0	0	0	0	0.135939	0	0	0.002689	0	0
SAN FRANCISCO BAY AREA	2022	LDT2	Aggregated	Aggregated	ELEC	9374.271	290025.2	47131.73	0	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003996	0.014915	0	0	0	0.004888	0	0.003996	0.014915	0	0	0	0	0	0
SAN FRANCISCO BAY AREA	2022	LHDT1	Aggregated	Aggregated	GAS	68709.4	2370029	1023668	0.242671	0.038677	0.534944	0.002172	0	0.00039	0.002	0.03276	0.002363	0	0.000425	0.008	0.07644	1009.44	121.3077	19.0483	0.01121	0.122086	0.025458	0.01462	0.003141	0.041616	0.054644	0.443006	0.128752	0.125523	0.897897	0.024788	0.045916	0.079736	0.646434	0.140967	0.125523	0.897897	0.024788	0.045916	1.007142	3.750363	1.781746	0.009989	0.0012	0.000188
SAN FRANCISCO BAY AREA	2022	LHDT1	Aggregated	Aggregated	DSL	50220.89	1875941	637115.7	1.884904	2.110515	0	0.023831	0.026883	0	0	0.003	0.03276	0.024908	0.028098	0	0.012	0.07644	550.5482	134.3388	0	0.007699	0.005098	0	0.086539	0.021116	0	0.165749	0.10976	0	0	0	0	0	0.188695	0.124954	0	0	0	0	0	0.716759	0.909745	0	0.005205	0.00127	0
SAN FRANCISCO BAY AREA	2022	LHDT2	Aggregated	Aggregated	GAS	9572.942	331342.5	142622.6	0.235692	0.038306	0.529023	0.001987	0	0.000329	0.002	0.03822	0.002161	0	0.000358	0.008	0.08918	1152.596	139.4897	21.60905	0.008492	0.12204	0.024456	0.015018	0.003079	0.04085	0.038262	0.439052	0.122482	0.113626	0.766957	0.02182	0.039806	0.055832	0.640664	0.134102	0.113626	0.766957	0.02182	0.039806	0.703405	3.757394	1.754034	0.011406	0.00138	0.000214
SAN FRANCISCO BAY AREA	2022	LHDT2	Aggregated	Aggregated	DSL	18356.54	691439.7	230902.2	1.411907	2.076103	0	0.022327	0.026909	0	0	0.003	0.03822	0.023337	0.028126	0	0.012	0.08918	616.076	214.5393	0	0.007074	0.005098	0	0.096839	0.033723	0	0.15229	0.10976	0	0	0	0	0	0.173372	0.124954	0	0	0	0	0	0.655961	0.909745	0	0.005824	0.002028	0
SAN FRANCISCO BAY AREA	2022	MCY	Aggregated	Aggregated	GAS	134693	1018115	269386	1.168948	0	0.273206	0.001896	0	0.00313	0.001	0.00504	0.002026	0	0.003319	0.004	0.01176	214.7532	0	62.0832	0.343018	0	0.260878	0.067018	0	0.01542	2.343292	0	2.000123	0.736925	2.24255	0.984065	1.666989	2.886728	0	2.176255	0.736925	2.24255	0.984065	1.666989	20.2938	0	9.064446	0.002125	0	0.000614
SAN FRANCISCO BAY AREA	2022	MDV	Aggregated	Aggregated	GAS	597176.6	19844227	2757383	0.095516	0	0.374519	0.001425	0	0.001916	0.002	0.01575	0.00155	0	0.002084	0.008	0.03675	399.3526	0	87.1914	0.004501	0	0.088907	0.007672	0	0.036828	0.018851	0	0.444015	0.147881	0.478163	0.325918	0.323265	0.027457	0	0.486134	0.147881	0.478163	0.325918	0.323265	0.93785	0	3.464778	0.003952	0	0.000863
SAN FRANCISCO BAY AREA	2022	MDV	Aggregated	Aggregated	DSL	14887.2	566386	72228.74	0.043037	0	0	0.004416	0	0	0	0.002	0.01575	0.004616	0	0	0.008	0.03675	370.6445	0	0	0.000517	0	0	0.058263	0	0	0.011134	0	0	0	0	0.012675	0	0	0	0	0	0	0	0.19921	0	0	0.003504	0	0
SAN FRANCISCO BAY AREA	2022	MDV	Aggregated	Aggregated	ELEC	4155.654	134974.2	21211.87	0	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003986	0.014863	0	0	0	0.004888	0	0.003986	0.014863	0	0	0	0	0	0
SAN FRANCISCO BAY AREA	2022	MH	Aggregated	Aggregated	GAS	11045.97	102924.8	1105.039	0.403792	0	0.336282	0.001588	0	0.000351	0.003	0.05586	0.001727	0	0.000382	0.012	0.13034	1756.866	0	25.94705	0.014429	0	0.03247	0.025088	0	0.035252	0.062598	0	0.137059	0.08411	2.005442	0.034249	0.093253	0.091343	0	0.150062	0.08411	2.005442	0.034249	0.093253	1.575807	0	3.023755	0.017386	0	0.000257
SAN FRANCISCO BAY AREA	2022	MH	Aggregated	Aggregated	DSL	4069.667	39131.2	406.9667	4.247074	0	0	0.090732	0	0	0.004	0.05586	0.094835	0	0	0	0.016	0.13034	1020.787	0	0	0.005111	0	0	0.160453	0	0	0.110043	0	0	0	0	0.125276	0	0	0	0	0	0	0	0.391534	0	0	0.00965	0	0
SAN FRANCISCO BAY AREA	2022	MHDT	Aggregated	Aggregated	GAS	6447.826	344927.7	129008.1	0.490189	0.088452	0.380589	0.001264	0	0.000451	0.003	0.05586	0.001375	0	0.000491	0.012	0.13034	1736.063	536.2364	39.30788	0.015334	0.263318	0.040638	0.024076	0.007482	0.029444	0.07528	1.012198	0.220488	0.08766	0.510102	0.018992	0.034691	0.109848	1.476997	0.241406	0.08766	0.510102	0.018992	0.034691	1.730397	15.11053	4.932466	0.01718	0.005306	0.000389
SAN FRANCISCO BAY AREA	2022	MHDT	Aggregated	Aggregated	DSL	46144.44	2797463	458784.3	2.200197	7.670083	1.704167	0.037649	0.01542	0	0.003	0.05586	0.039351	0.016118	0	0.012	0.13034	1041.276	950.3743	0	0.004141	0.004787	0	0.163674	0.149386	0	0.089148	0.103065	0	0	0	0	0	0.101488	0.117331	0	0	0	0	0	0	0.307324	2.707213	0	0.009837	0.008979	0
SAN FRANCISCO BAY AREA	2022	OBUS	Aggregated	Aggregated	GAS	2377.746	118322.3	47573.94	0.493126	0.065042	0.324762	0.000952	0	0.000229	0.003	0.05586	0.001035	0	0.00025	0.012	0.13034	1779.829	379.8122	26.68933	0.014816	0.19996	0.030865	0.02461	0.00559	0.026176	0.071209	0.745981	0.159807	0.029169	0.325101	0.017395	0.037329	0.103908	1.088533	0.174968	0.029169	0.325101	0.017395	0.037329	1.592517	5.772881	3.37513	0.017613	0.003759	0.000264
SAN FRANCISCO BAY AREA	2022	OBUS	Aggregated	Aggregated	DSL	2832.827	204735.5	26545.39	2.50071	12.46756	1.921771	0.026894	0.019766	0	0.003	0.05586	0.02811	0.02066	0	0.012	0.13034	1213.471	2223.844	0	0.003373	0.034735	0	0.190741	0.349557	0	0.072614	0.747836	0	0	0	0	0	0.082665	0.851354	0	0	0	0	0	0	0.281438	10.35405	0	0.011464	0.02101	0
SAN FRANCISCO BAY AREA	2022	SBUS	Aggregated	Aggregated	GAS	716.9364	34599	2867.746	0.393533	0.924408	0.546251	0.001331	0	0.000558	0.002	0.3192	0.001447	0	0.000607	0.008	0.7448	851.4107	2545.361	48.04789	0.010956	2.459373	0.0573	0.022747	0.090263	0.05268	0.053522	10.61047	0.324332	0.052285	0.367692	0.008703	0.020457	0.078099	15.48277	0.355102	0.052285	0.367692	0.008703	0.020457	1.158101	82.05241	8.578014	0.008425	0.025188	0.000475
SAN FRANCISCO BAY AREA	2022	SBUS	Aggregated	Aggregated	DSL	3416.369	109060.8	39424.43	5.763916	40.15788	0.983636	0.034128	0.040121	0	0.003	0.3192	0.035671	0.041935	0	0.012	0.7448	1114.07	3652.699	0	0.003972	0.012905	0	0.175116	0.574153	0	0.085524	0.277845	0	0	0	0	0	0.097362	0.316306	0	0	0	0	0	0	0.244566	6.66058	0	0.010525	0.034509	0
SAN FRANCISCO BAY AREA	2022	UBUS	Aggregated	Aggregated	GAS	190.2155	13927.94	760.862	0.266085	0	0.771939	0.00128	0	0.0004	0.002662	0.049902	0.001392	0	0.000435	0.010649	0.116437	1885.75	0	75.16355	0.00542	0	0.095563	0.021973	0	0.06621	0.017751	0	0.424003	0.06246	0.405024	0.010493	0.016538	0.025902	0	0.46423	0.06246	0.405024	0.010493	0.016538	0.333341	0	6.659945	0.018661	0	0.000744
SAN FRANCISCO BAY AREA	2022	UBUS	Aggregated	Aggregated	DSL	2267.28	228919.9	9069.121	1.515421	0	0	0.006195	0	0	0.008168	0.030528	0.006475	0	0	0.032674	0.071232	1606.851	0	0	0.11494	0	0	0.252575	0	0	0.001703	0	0	0	0	0	0	0.117371	0	0	0	0	0	0	0.190861	0	0.015191	0	0	0
SAN FRANCISCO BAY AREA	2022	UBUS	Aggregated	Aggregated	ELEC	12.02059	1081.877	48.08237	0	0	0	0	0	0	0.008998	0.026472	0	0	0	0.03599	0.061768	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAN FRANCISCO BAY AREA	2022	UBUS	Aggregated	Aggregated	NG	523.2993	52848.53	2093.197	0.473893	0	0	0.003102	0	0	0.008035	0.031173	0.003243	0	0	0.032141	0.072738	1961.968	0	0	6.1519	0	0	0.39996	0	0	0.088022	0	0	0	0	0	0	6.2786	0	0	0	0	0	0	47.56704	0	0	0	0	0

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLE X	NOx_STREX	PM2.5_R UNEX	PM2.5_IDLE X	PM2.5_ST REX	PM2.5_P MTW	PM2.5_P MBW	PM10_RU NEX	PM10_IDL EX	PM10_ST REX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLE X	CO2_STRE EX	CH4_RUN X	CH4_IDLE X	CH4_STRE EX	N2O_RUN X	N2O_IDLE EX	N2O_STR EX	ROG_RUN X	ROG_IDLE EX	ROG_STR EX	ROG_HOT SOAK	ROG_RUN LOSS	ROG_RES TLOSS	ROG_DIU RN	TOG_RUN EX	TOG_IDLE X	TOG_STRE X	TOG_HOT SOAK	TOG_RUN LOSS	TOG_REST LOSS	TOG_DIU RN	CO_RUNE X	CO_IDLEX	CO_STREX	SOx_RUN EX	SOx_IDLE X	SOx_STRE X
SAN FRANCISCO BAY AREA	2022	LDT1	Aggregated	Aggregated	GAS	291836.686	9811542	1346181	0.090870772	0	0.263204407	0.001751	0	0.002269	0.002	0.01575	0.001904	0	0.002467	0.008000002	0.036750011	304.6484215	0	64.97666	0.004893	0	0.073331	0.007247	0	0.029457	0.021274	0	0.365848	0.183398	0.669177	0.342141	0.405488	0.031025	0	0.400556	0.183398	0.669177	0.342141	0.405488	1.042717	0	2.514924	0.003015	0	0.000643

	Running (RUNEX, PMTW, PMBW) grams per mile									Process (IDLEX, STREX, TOTEX, DIURN, HTSK, RUNLS, RESTL) grams per trip								
	ROG	NOx	CO	PM10 Ex	PM2.5 Ex	SO2	CO2	CH4	N2O	ROG	NOx	CO	PM10 Ex	PM2.5 Ex	SO2	CO2	CH4	N2O
LDT1	0.02	0.09	1.04	0.05	0.02	0.00	304.65	0.00	0.01	1.97	0.26	2.51	0.00	0.00	0.00	64.98	0.07	0.03

Running Emission Factor (pounds per mile) — Paved

	ROG	NOx	CO	SO2	Exhaust PM10	Dust PM 10	Exhaust PM2.5	Dust PM2.5	CO2e
2022	4.6901E-05	0.0002	0.002299	6.64636E-06	0.000103	0.003883983	4.3E-05	0.00095334	0.613889

Process Emission Factor (pounds per trip)

ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	CO2e
0.004334	0.00058	0.005544	1.41756E-06	5.43942E-06	5.00168E-06	0.151616

GWPs (Fourth Assessment Report)

factor		
0.00220462	CO2:	1
	CH4:	28
	N2O:	298

1 metric ton (t)
1.102311 short tons

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Populatio n	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	X	PM2.5_RUNE X	PM2.5_IDLEX	PM2.5_STRE W	PM2.5_PMT W	PM2.5_PMB W	X	PM10_RUNE	PM10_IDLEX	PM10_STREX	W	PM10_PMT W	PM10_PMB W	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSO AK	ROG_RUNLO SS	ROG_RESTLO SS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSO AK	TOG_RUNLO SS	TOG_RESTLO SS	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
SAN FRANC	2022	LHDT2	Aggregate	Aggregate	DSL	18356.54	691439.7	230902.2	1.41190749	2.07610274		0	0.0223275	0.0269088		0	0.003	0.03822001	0.02333705	0.0281255		0	0.012	0.08918003	616.076006	214.539309		0	0.00707359	0.00509813		0	0.09683857	0.03372259		0	0.15229012	0.1097597		0	0	0	0	0	0.17337218	0.12495413		0	0	0	0	0.65596133	0.90974508		0	0.00582413	0.00202817	0

	Running (RUNEX, PMTW, PMBW) grams per mile								Process (IDLEX, STREX, TOTEX, DIURN, HTSK, RUNLS, RESTL) grams per trip							
	ROG	NOx	CO	PM10 Ex	PM2.5 Ex	SO2	CO2	CH4	N2O	ROG	NOx	CO	PM10 Ex	PM2.5 Ex	SO2	CO2	CH4	N2O
LHDT2	0.15	1.41	0.66	0.12	0.06	0.01	616.08	0.01	0.10	0.11	2.08	0.91	0.03	0.03	0.00	214.54	0.01	0.03

Running Emission Factor (pounds per mile) Paved

	ROG	NOx	CO	SO2	Exhaust PM10	Dust PM 10	Exhaust PM2.5	Dust PM2.5	CO2e
2022	0.000336	0.003113	0.001446	1.284E-05	0.00027451	0.00388398	0.0001401	0.00095334	1.29026239

Process Emission Factor (pounds per trip)

ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	CO2e
0.00024198	0.00457702	0.00200564	4.4713E-06	6.2006E-05	5.9324E-05	0.44946224

GWPs (Fourth Assessment Report)

factor	CO2:	1
0.002205	CH4:	28
	N2O:	298

1 metric ton (t)
1.10231131 short tons

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_REXT	PM2.5_IDLEX	PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
SAN FRANCISCO BAY AREA	2022	MHDT	Aggregated	Aggregated	DSL	46144.44	2797463	458784.3	2.200196666	7.670083	1.704167	0.037649	0.01542	0	0.003	0.05586	0.039351	0.016118	0	0.012000003	0.130340037	1041.276	950.374263	0	0.004141	0.004787	0	0.163674	0.149386	0	0.089148	0.103065	0	0	0	0	0	0.101488	0.117331	0	0	0	0	0	0	0.307324	2.707213	0	0.009837	0.008979	0

	Running (RUNEX, PMTW, PMBW) grams per mile								Process (IDLEX, STREX, TOTEX, DIURN, HTSK, RUNLS, RESTL) grams per trip							
	ROG	NOx	CO	PM10 Ex	PM2.5 Ex	SO2	CO2	CH4	N2O	ROG	NOx	CO	PM10 Ex	PM2.5 Ex	SO2	CO2	CH4	N2O
MHDT	0.09	2.20	0.31	0.18	0.10	0.01	1041.28	0.00	0.16	0.10	9.37	2.71	0.02	0.02	0.01	950.37	0.00	0.15

Running Emission Factor (pounds per mile) — Paved

	ROG	NOx	CO	SO2	Exhaust PM10	Dust PM 10	Exhaust PM2.5	Dust PM2.5	CO2e
2022	0.000197	0.004851	0.000678	2.16879E-05	0.000401	0.003884	0.000213	0.000953	2.180331

Process Emission Factor (pounds per trip)

ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	CO2e
0.000227	0.020667	0.005968	1.97945E-05	3.55331E-05	3.4E-05	1.99004806

GWPs (Fourth Assessment Report)

factor		
0.002205	CO2:	1
	CH4:	28
	N2O:	298

1 metric ton (t)
1.102311 short tons

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RUNEX	PM2.5_IDLEX	PM2.5_STREX	PM2.5_PMTW	PM2.5_PMBW	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
SAN FRANC	2022	HHDT	Aggregated	Aggregated	DSL	36411.82	4387801	381736.1	3.516434	62.13251	2.095419	0.033594	0.034593	0	0.008868	0.026071	0.035113	0.036157	0	0.035471	0.060832412	1481.329	11601.8943	0	0.003844	0.212645	0	0.232844	1.823656	0	0.082761	4.57818	0	0	0	0	0	0.094217	5.211909	0	0	0	0	0	0.36379	62.38175	0	0.013995	0.109609	0

Running (RUNEX, PMTW, PMBW) grams per mile

	ROG	NOx	CO	PM10 Ex	PM10 D	PM2.5 Ex	PM2.5 D	SO2	CO2	CH4	N2O
HHDT	0.08	3.52	0.36	0.13	0.00	0.07	0.00	0.01	1481.33	0.00	0.23

Process (IDLEX, STREX, TOTEX, DIURN, HTSK, RUNLS, RESTL) grams per trip

ROG	NOx	CO	PM10 Ex	PM10 D	PM2.5 Ex	PM2.5 D	SO2	CO2	CH4	N2O
4.58	64.23	62.38	0.04	0.00	0.03	0.00	0.11	11601.89	0.21	1.82

Running Emission Factor (pounds per mile) — Paved

	ROG	NOx	CO	SO2	Exhaust PM10	Dust PM 10	Exhaust PM2.5	Dust PM2.5	CO2e
2022	0.000182	0.007752	0.000802	3.09E-05	0.00029	0.003884	0.000151	0.000953	0.007538

Process Emission Factor (pounds per trip)

ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	CO2e
0.010093	0.141598	0.137528	0.000242	7.97129E-05	7.63E-05	0.059059553

GWPs (Fourth Assessment Report)

factor			
0.002205	CO2:	1	
	CH4:	28	**1 metric ton** (t)
	N2O:	298	1.102311 short tons

Appendix C

Air Quality Supporting Information

Air Quality Emissions Assumptions and Calculations

CalEEMod Emissions Model Results

Health Risk Assessment

Lower Channel Concrete Removal

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	0.00	1000sqft	0.00	0.10	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lower Channel Concrete Removal - San Francisco Bay Area Air Basin, Annual

Project Characteristics - Aug 8, 2022 start

Land Use - no paving

Construction Phase - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Trips and VMT - Refer to spreadsheet (ABAG MTC 2017); Trucks calculated separately

Demolition - Refer to spreadsheet

Grading - Refer to spreadsheet

Construction Off-road Equipment Mitigation - Watering; Tier 3, DPF level 3

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

Lower Channel Concrete Removal - San Francisco Bay Area Air Basin, Annual

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	0.00	15.00
tblConstructionPhase	NumDays	0.00	30.00
tblConstructionPhase	NumDays	0.00	8.00
tblConstructionPhase	NumDays	0.00	24.00
tblGrading	AcresOfGrading	3.75	1.98
tblLandUse	LandUseSquareFeet	0.00	0.10
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	187.00	0.00
tblOffRoadEquipment	HorsePower	187.00	0.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	221.00	355.00
tblOffRoadEquipment	HorsePower	231.00	175.00
tblOffRoadEquipment	HorsePower	158.00	120.00
tblOffRoadEquipment	HorsePower	158.00	120.00
tblOffRoadEquipment	HorsePower	187.00	140.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.41	0.00

Lower Channel Concrete Removal - San Francisco Bay Area Air Basin, Annual

tblOffRoadEquipment	LoadFactor	0.41	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00

tblTripsAndVMT	HaulingTripNumber	44.00	0.00
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripNumber	10.00	12.00
tblTripsAndVMT	WorkerTripNumber	8.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	8.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0327	0.2238	0.2464	4.7000e-004	0.0102	9.5500e-003	0.0198	2.0100e-003	9.2600e-003	0.0113	0.0000	37.8688	37.8688	6.6400e-003	0.0000	38.0349
Maximum	**0.0327**	**0.2238**	**0.2464**	**4.7000e-004**	**0.0102**	**9.5500e-003**	**0.0198**	**2.0100e-003**	**9.2600e-003**	**0.0113**	**0.0000**	**37.8688**	**37.8688**	**6.6400e-003**	**0.0000**	**38.0349**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0168	0.2586	0.2748	4.7000e-004	6.6700e-003	2.1600e-003	8.8200e-003	1.5000e-003	2.1500e-003	3.6500e-003	0.0000	37.8688	37.8688	6.6400e-003	0.0000	38.0348
Maximum	**0.0168**	**0.2586**	**0.2748**	**4.7000e-004**	**6.6700e-003**	**2.1600e-003**	**8.8200e-003**	**1.5000e-003**	**2.1500e-003**	**3.6500e-003**	**0.0000**	**37.8688**	**37.8688**	**6.6400e-003**	**0.0000**	**38.0348**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**48.73**	**-15.58**	**-11.53**	**0.00**	**34.74**	**77.38**	**55.39**	**25.37**	**76.78**	**67.61**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	8-8-2022	9-30-2022	0.2202	0.2372
		Highest	0.2202	0.2372

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Lower Channel Concrete Removal - San Francisco Bay Area Air Basin, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/8/2022	8/26/2022	5	15	
2	Grading	Grading	8/27/2022	10/7/2022	5	30	
3	Planting Phase I	Site Preparation	10/3/2022	10/12/2022	5	8	
4	Planting Phase II	Site Preparation	10/31/2022	12/1/2022	5	24	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1.98

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Lower Channel Concrete Removal - San Francisco Bay Area Air Basin, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Bore/Drill Rigs	1	5.30	355	0.50
Demolition	Concrete/Industrial Saws	0	0.00	0	0.00
Demolition	Cranes	1	2.70	175	0.29
Demolition	Excavators	1	6.00	120	0.38
Demolition	Pumps	1	24.00	44	0.74
Demolition	Rubber Tired Dozers	0	0.00	0	0.00
Demolition	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Grading	Concrete/Industrial Saws	0	0.00	0	0.00
Grading	Excavators	1	5.00	120	0.38
Grading	Graders	1	2.00	140	0.41
Grading	Pumps	1	24.00	44	0.74
Grading	Rubber Tired Dozers	0	0.00	0	0.00
Grading	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Planting Phase I	Graders	0	0.00	0	0.00
Planting Phase I	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Planting Phase II	Graders	0	0.00	0	0.00
Planting Phase II	Tractors/Loaders/Backhoes	0	0.00	0	0.00

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Planting Phase I	0	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Planting Phase II	0	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.7700e-003	0.0000	4.7700e-003	7.2000e-004	0.0000	7.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0118	0.0881	0.0915	2.0000e-004		3.6900e-003	3.6900e-003		3.5500e-003	3.5500e-003	0.0000	16.1486	16.1486	3.7100e-003	0.0000	16.2415
Total	**0.0118**	**0.0881**	**0.0915**	**2.0000e-004**	**4.7700e-003**	**3.6900e-003**	**8.4600e-003**	**7.2000e-004**	**3.5500e-003**	**4.2700e-003**	**0.0000**	**16.1486**	**16.1486**	**3.7100e-003**	**0.0000**	**16.2415**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.3000e-004	2.4500e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8029	0.8029	2.0000e-005	0.0000	0.8033
Total	**3.3000e-004**	**2.3000e-004**	**2.4500e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8029**	**0.8029**	**2.0000e-005**	**0.0000**	**0.8033**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8600e-003	0.0000	1.8600e-003	2.8000e-004	0.0000	2.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4300e-003	0.1117	0.1161	2.0000e-004		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	16.1486	16.1486	3.7100e-003	0.0000	16.2414
Total	**6.4300e-003**	**0.1117**	**0.1161**	**2.0000e-004**	**1.8600e-003**	**8.5000e-004**	**2.7100e-003**	**2.8000e-004**	**8.5000e-004**	**1.1300e-003**	**0.0000**	**16.1486**	**16.1486**	**3.7100e-003**	**0.0000**	**16.2414**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.3000e-004	2.4500e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8029	0.8029	2.0000e-005	0.0000	0.8033
Total	**3.3000e-004**	**2.3000e-004**	**2.4500e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8029**	**0.8029**	**2.0000e-005**	**0.0000**	**0.8033**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0500e-003	0.0000	1.0500e-003	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.1347	0.1441	2.4000e-004		5.8400e-003	5.8400e-003		5.6800e-003	5.6800e-003	0.0000	18.1695	18.1695	2.8600e-003	0.0000	18.2409
Total	**0.0194**	**0.1347**	**0.1441**	**2.4000e-004**	**1.0500e-003**	**5.8400e-003**	**6.8900e-003**	**1.1000e-004**	**5.6800e-003**	**5.7900e-003**	**0.0000**	**18.1695**	**18.1695**	**2.8600e-003**	**0.0000**	**18.2409**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	4.6000e-004	4.9100e-003	2.0000e-005	1.9900e-003	1.0000e-005	2.0000e-003	5.3000e-004	1.0000e-005	5.4000e-004	0.0000	1.6059	1.6059	3.0000e-005	0.0000	1.6067
Total	**6.7000e-004**	**4.6000e-004**	**4.9100e-003**	**2.0000e-005**	**1.9900e-003**	**1.0000e-005**	**2.0000e-003**	**5.3000e-004**	**1.0000e-005**	**5.4000e-004**	**0.0000**	**1.6059**	**1.6059**	**3.0000e-005**	**0.0000**	**1.6067**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.1000e-004	0.0000	4.1000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.8500e-003	0.1460	0.1479	2.4000e-004		1.2800e-003	1.2800e-003		1.2800e-003	1.2800e-003	0.0000	18.1695	18.1695	2.8600e-003	0.0000	18.2409
Total	**8.8500e-003**	**0.1460**	**0.1479**	**2.4000e-004**	**4.1000e-004**	**1.2800e-003**	**1.6900e-003**	**4.0000e-005**	**1.2800e-003**	**1.3200e-003**	**0.0000**	**18.1695**	**18.1695**	**2.8600e-003**	**0.0000**	**18.2409**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	4.6000e-004	4.9100e-003	2.0000e-005	1.9900e-003	1.0000e-005	2.0000e-003	5.3000e-004	1.0000e-005	5.4000e-004	0.0000	1.6059	1.6059	3.0000e-005	0.0000	1.6067
Total	**6.7000e-004**	**4.6000e-004**	**4.9100e-003**	**2.0000e-005**	**1.9900e-003**	**1.0000e-005**	**2.0000e-003**	**5.3000e-004**	**1.0000e-005**	**5.4000e-004**	**0.0000**	**1.6059**	**1.6059**	**3.0000e-005**	**0.0000**	**1.6067**

3.4 Planting Phase I - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Planting Phase I - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	8.0000e-005	8.7000e-004	0.0000	3.5000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.2855	0.2855	1.0000e-005	0.0000	0.2856
Total	**1.2000e-004**	**8.0000e-005**	**8.7000e-004**	**0.0000**	**3.5000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.2855**	**0.2855**	**1.0000e-005**	**0.0000**	**0.2856**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Planting Phase I - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	8.0000e-005	8.7000e-004	0.0000	3.5000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.2855	0.2855	1.0000e-005	0.0000	0.2856
Total	**1.2000e-004**	**8.0000e-005**	**8.7000e-004**	**0.0000**	**3.5000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.2855**	**0.2855**	**1.0000e-005**	**0.0000**	**0.2856**

3.5 Planting Phase II - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Planting Phase II - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.5000e-004	2.6200e-003	1.0000e-005	1.0600e-003	1.0000e-005	1.0700e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8565	0.8565	2.0000e-005	0.0000	0.8569
Total	**3.6000e-004**	**2.5000e-004**	**2.6200e-003**	**1.0000e-005**	**1.0600e-003**	**1.0000e-005**	**1.0700e-003**	**2.8000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.8565**	**0.8565**	**2.0000e-005**	**0.0000**	**0.8569**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Planting Phase II - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.5000e-004	2.6200e-003	1.0000e-005	1.0600e-003	1.0000e-005	1.0700e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8565	0.8565	2.0000e-005	0.0000	0.8569
Total	**3.6000e-004**	**2.5000e-004**	**2.6200e-003**	**1.0000e-005**	**1.0600e-003**	**1.0000e-005**	**1.0700e-003**	**2.8000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.8565**	**0.8565**	**2.0000e-005**	**0.0000**	**0.8569**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.578638	0.038775	0.193686	0.110919	0.015677	0.005341	0.018293	0.026358	0.002641	0.002200	0.005832	0.000891	0.000749

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Flood Wall (Segment #1) Construction

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	0.95	1000sqft	0.02	950.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Flood Wall (Segment #1) Construction - San Francisco Bay Area Air Basin, Annual

Project Characteristics - 2023 Operations

Land Use - 950 sf concrete area

Construction Phase - 4/1 to 7/7

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Trips and VMT - Refer to spreadsheet (ABAG MTC 2017); Trucks calculated separately

Demolition - Negligible

Grading - Refer to spreadsheet

Construction Off-road Equipment Mitigation - Tier 3 and level 3; watering

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	100.00	50.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	2.00	5.00
tblConstructionPhase	NumDays	5.00	10.00
tblGrading	AcresOfGrading	0.00	0.13

tblOffRoadEquipment	HorsePower	9.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	231.00	0.00
tblOffRoadEquipment	HorsePower	89.00	0.00
tblOffRoadEquipment	HorsePower	130.00	0.00
tblOffRoadEquipment	HorsePower	80.00	0.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	158.00	25.00
tblOffRoadEquipment	HorsePower	158.00	25.00
tblOffRoadEquipment	HorsePower	158.00	25.00
tblOffRoadEquipment	HorsePower	84.00	550.00
tblOffRoadEquipment	LoadFactor	0.56	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.29	0.00
tblOffRoadEquipment	LoadFactor	0.20	0.00
tblOffRoadEquipment	LoadFactor	0.42	0.00
tblOffRoadEquipment	LoadFactor	0.38	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.00

Flood Wall (Segment #1) Construction - San Francisco Bay Area Air Basin, Annual

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	4.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	2.40
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblTripsAndVMT	WorkerTripLength	10.80	15.10

tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripNumber	5.00	12.00
tblTripsAndVMT	WorkerTripNumber	5.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	3.00	12.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	5.5200e-003	0.0349	0.0453	1.3000e-004	4.7100e-003	1.4100e-003	6.1200e-003	1.2400e-003	1.3400e-003	2.5800e-003	0.0000	12.2157	12.2157	1.1100e-003	0.0000	12.2434
Maximum	**5.5200e-003**	**0.0349**	**0.0453**	**1.3000e-004**	**4.7100e-003**	**1.4100e-003**	**6.1200e-003**	**1.2400e-003**	**1.3400e-003**	**2.5800e-003**	**0.0000**	**12.2157**	**12.2157**	**1.1100e-003**	**0.0000**	**12.2434**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	3.9100e-003	0.0468	0.0637	1.3000e-004	4.6700e-003	3.7000e-004	5.0400e-003	1.2400e-003	3.7000e-004	1.6100e-003	0.0000	12.2157	12.2157	1.1100e-003	0.0000	12.2434
Maximum	**3.9100e-003**	**0.0468**	**0.0637**	**1.3000e-004**	**4.6700e-003**	**3.7000e-004**	**5.0400e-003**	**1.2400e-003**	**3.7000e-004**	**1.6100e-003**	**0.0000**	**12.2157**	**12.2157**	**1.1100e-003**	**0.0000**	**12.2434**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**29.17**	**-34.14**	**-40.53**	**0.00**	**0.85**	**73.76**	**17.65**	**0.00**	**72.39**	**37.60**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Flood Wall (Segment #1) Construction - San Francisco Bay Area Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2022	6-30-2022	0.0311	0.0368
2	7-1-2022	9-30-2022	0.0092	0.0139
		Highest	0.0311	0.0368

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.0000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.0000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Flood Wall (Segment #1) Construction - San Francisco Bay Area Air Basin, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2022	4/7/2022	5	5	
2	Grading	Grading	4/8/2022	4/14/2022	5	5	
3	Building Construction	Building Construction	4/15/2022	6/23/2022	5	50	
4	Paving	Paving	6/24/2022	7/7/2022	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.13

Acres of Paving: 0.02

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Flood Wall (Segment #1) Construction - San Francisco Bay Area Air Basin, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	0	0.00
Demolition	Excavators	1	4.00	25	0.38
Demolition	Rubber Tired Dozers	0	0.00	0	0.00
Demolition	Tractors/Loaders/Backhoes	1	4.00	67	0.37
Grading	Concrete/Industrial Saws	0	0.00	0	0.00
Grading	Excavators	1	4.00	25	0.38
Grading	Rubber Tired Dozers	0	0.00	0	0.00
Grading	Tractors/Loaders/Backhoes	1	4.00	67	0.37
Building Construction	Cranes	0	0.00	0	0.00
Building Construction	Excavators	1	2.40	25	0.38
Building Construction	Forklifts	0	0.00	0	0.00
Building Construction	Tractors/Loaders/Backhoes	1	2.40	67	0.37
Paving	Cement and Mortar Mixers	0	0.00	0	0.00
Paving	Pavers	0	0.00	0	0.00
Paving	Pumps	1	2.50	550	0.74
Paving	Rollers	0	0.00	0	0.00
Paving	Tractors/Loaders/Backhoes	0	0.00	0	0.00

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	1	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.4000e-004	2.2200e-003	2.8300e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**2.4000e-004**	**2.2200e-003**	**2.8300e-003**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3000e-004	2.4700e-003	2.8800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**1.3000e-004**	**2.4700e-003**	**2.8800e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.0000e-005	0.0000	7.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4000e-004	2.2200e-003	2.8300e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**2.4000e-004**	**2.2200e-003**	**2.8300e-003**	**0.0000**	**7.0000e-005**	**1.1000e-004**	**1.8000e-004**	**1.0000e-005**	**1.0000e-004**	**1.1000e-004**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3000e-004	2.4700e-003	2.8800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**1.3000e-004**	**2.4700e-003**	**2.8800e-003**	**0.0000**	**3.0000e-005**	**2.0000e-005**	**5.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4500e-003	0.0133	0.0170	2.0000e-005		6.7000e-004	6.7000e-004		6.1000e-004	6.1000e-004	0.0000	2.0147	2.0147	6.5000e-004	0.0000	2.0310
Total	**1.4500e-003**	**0.0133**	**0.0170**	**2.0000e-005**		**6.7000e-004**	**6.7000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**2.0147**	**2.0147**	**6.5000e-004**	**0.0000**	**2.0310**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1100e-003	7.7000e-004	8.1800e-003	3.0000e-005	3.3100e-003	2.0000e-005	3.3300e-003	8.8000e-004	2.0000e-005	9.0000e-004	0.0000	2.6764	2.6764	5.0000e-005	0.0000	2.6778
Total	**1.1100e-003**	**7.7000e-004**	**8.1800e-003**	**3.0000e-005**	**3.3100e-003**	**2.0000e-005**	**3.3300e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**2.6764**	**2.6764**	**5.0000e-005**	**0.0000**	**2.6778**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.6000e-004	0.0148	0.0173	2.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	2.0147	2.0147	6.5000e-004	0.0000	2.0310
Total	**7.6000e-004**	**0.0148**	**0.0173**	**2.0000e-005**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**2.0147**	**2.0147**	**6.5000e-004**	**0.0000**	**2.0310**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1100e-003	7.7000e-004	8.1800e-003	3.0000e-005	3.3100e-003	2.0000e-005	3.3300e-003	8.8000e-004	2.0000e-005	9.0000e-004	0.0000	2.6764	2.6764	5.0000e-005	0.0000	2.6778
Total	**1.1100e-003**	**7.7000e-004**	**8.1800e-003**	**3.0000e-005**	**3.3100e-003**	**2.0000e-005**	**3.3300e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**2.6764**	**2.6764**	**5.0000e-005**	**0.0000**	**2.6778**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0300e-003	0.0161	0.0112	6.0000e-005		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	5.7825	5.7825	1.6000e-004	0.0000	5.7865
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.0300e-003**	**0.0161**	**0.0112**	**6.0000e-005**		**4.9000e-004**	**4.9000e-004**		**4.9000e-004**	**4.9000e-004**	**0.0000**	**5.7825**	**5.7825**	**1.6000e-004**	**0.0000**	**5.7865**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6400e-003	1.0000e-005	6.6000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5353	0.5353	1.0000e-005	0.0000	0.5356
Total	**2.2000e-004**	**1.5000e-004**	**1.6400e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.7000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5353**	**0.5353**	**1.0000e-005**	**0.0000**	**0.5356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3500e-003	0.0260	0.0292	6.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	5.7825	5.7825	1.6000e-004	0.0000	5.7865
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3500e-003**	**0.0260**	**0.0292**	**6.0000e-005**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**5.7825**	**5.7825**	**1.6000e-004**	**0.0000**	**5.7865**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6400e-003	1.0000e-005	6.6000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5353	0.5353	1.0000e-005	0.0000	0.5356
Total	**2.2000e-004**	**1.5000e-004**	**1.6400e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.7000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5353**	**0.5353**	**1.0000e-005**	**0.0000**	**0.5356**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.578638	0.038775	0.193686	0.110919	0.015677	0.005341	0.018293	0.026358	0.002641	0.002200	0.005832	0.000891	0.000749

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	1.0000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**9.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**9.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Flood Wall (Segment #2) Construction

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	0.07	1000sqft	0.00	65.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Flood Wall (Segment #2) Construction - San Francisco Bay Area Air Basin, Annual

Project Characteristics - Start July 8, 2022

Land Use - 65 sf concrete area

Construction Phase - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Trips and VMT - Refer to spreadsheet (ABAG MTC 2017); Trucks calculated separately

Demolition - Negligible

Grading - Refer to spreadsheet

Construction Off-road Equipment Mitigation - Watering; Tier 3, DPF level 3

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	0.00	15.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	5.00
tblConstructionPhase	NumDays	0.00	10.00
tblGrading	AcresOfGrading	0.00	0.01

Flood Wall (Segment #2) Construction - San Francisco Bay Area Air Basin, Annual

tblLandUse	LandUseSquareFeet	70.00	65.00
tblOffRoadEquipment	HorsePower	9.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	231.00	0.00
tblOffRoadEquipment	HorsePower	89.00	0.00
tblOffRoadEquipment	HorsePower	130.00	0.00
tblOffRoadEquipment	HorsePower	80.00	0.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	158.00	25.00
tblOffRoadEquipment	HorsePower	158.00	25.00
tblOffRoadEquipment	HorsePower	158.00	25.00
tblOffRoadEquipment	HorsePower	84.00	550.00
tblOffRoadEquipment	LoadFactor	0.56	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.29	0.00
tblOffRoadEquipment	LoadFactor	0.20	0.00
tblOffRoadEquipment	LoadFactor	0.42	0.00
tblOffRoadEquipment	LoadFactor	0.38	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00

tblOffRoadEquipment	LoadFactor	0.37	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	4.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	2.70
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	7.00	0.00

tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripNumber	5.00	12.00
tblTripsAndVMT	WorkerTripNumber	5.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	3.00	12.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	3.7800e-003	0.0255	0.0283	9.0000e-005	2.3200e-003	9.6000e-004	3.2800e-003	6.2000e-004	9.2000e-004	1.5400e-003	0.0000	9.0075	9.0075	6.4000e-004	0.0000	9.0234
Maximum	**3.7800e-003**	**0.0255**	**0.0283**	**9.0000e-005**	**2.3200e-003**	**9.6000e-004**	**3.2800e-003**	**6.2000e-004**	**9.2000e-004**	**1.5400e-003**	**0.0000**	**9.0075**	**9.0075**	**6.4000e-004**	**0.0000**	**9.0234**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	2.6300e-003	0.0365	0.0465	9.0000e-005	2.3200e-003	2.6000e-004	2.5800e-003	6.2000e-004	2.6000e-004	8.8000e-004	0.0000	9.0075	9.0075	6.4000e-004	0.0000	9.0234
Maximum	**2.6300e-003**	**0.0365**	**0.0465**	**9.0000e-005**	**2.3200e-003**	**2.6000e-004**	**2.5800e-003**	**6.2000e-004**	**2.6000e-004**	**8.8000e-004**	**0.0000**	**9.0075**	**9.0075**	**6.4000e-004**	**0.0000**	**9.0234**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**30.42**	**-42.87**	**-64.07**	**0.00**	**0.00**	**72.92**	**21.34**	**0.00**	**71.74**	**42.86**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Flood Wall (Segment #2) Construction - San Francisco Bay Area Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	7-8-2022	9-30-2022	0.0293	0.0391
		Highest	0.0293	0.0391

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Flood Wall (Segment #2) Construction - San Francisco Bay Area Air Basin, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	7/8/2022	7/14/2022	5	5	
2	Grading	Grading	7/15/2022	7/21/2022	5	5	
3	Building Construction	Building Construction	7/22/2022	8/11/2022	5	15	
4	Paving	Paving	8/12/2022	8/25/2022	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.01

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Flood Wall (Segment #2) Construction - San Francisco Bay Area Air Basin, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	0	0.00
Demolition	Excavators	1	4.00	25	0.38
Demolition	Rubber Tired Dozers	0	0.00	0	0.00
Demolition	Tractors/Loaders/Backhoes	1	4.00	67	0.37
Grading	Concrete/Industrial Saws	0	0.00	0	0.00
Grading	Excavators	1	4.00	25	0.38
Grading	Rubber Tired Dozers	0	0.00	0	0.00
Grading	Tractors/Loaders/Backhoes	1	4.00	67	0.37
Building Construction	Cranes	0	0.00	0	0.00
Building Construction	Excavators	1	2.70	25	0.38
Building Construction	Forklifts	0	0.00	0	0.00
Building Construction	Tractors/Loaders/Backhoes	1	2.70	67	0.37
Paving	Cement and Mortar Mixers	0	0.00	0	0.00
Paving	Pavers	0	0.00	0	0.00
Paving	Pumps	1	2.50	550	0.74
Paving	Rollers	0	0.00	0	0.00
Paving	Tractors/Loaders/Backhoes	0	0.00	0	0.00

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	1	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.4000e-004	2.2200e-003	2.8300e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**2.4000e-004**	**2.2200e-003**	**2.8300e-003**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3000e-004	2.4700e-003	2.8800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**1.3000e-004**	**2.4700e-003**	**2.8800e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4000e-004	2.2200e-003	2.8300e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**2.4000e-004**	**2.2200e-003**	**2.8300e-003**	**0.0000**	**1.0000e-005**	**1.1000e-004**	**1.2000e-004**	**0.0000**	**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3000e-004	2.4700e-003	2.8800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**1.3000e-004**	**2.4700e-003**	**2.8800e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.9000e-004	4.5000e-003	5.7300e-003	1.0000e-005		2.3000e-004	2.3000e-004		2.1000e-004	2.1000e-004	0.0000	0.6800	0.6800	2.2000e-004	0.0000	0.6855
Total	**4.9000e-004**	**4.5000e-003**	**5.7300e-003**	**1.0000e-005**		**2.3000e-004**	**2.3000e-004**		**2.1000e-004**	**2.1000e-004**	**0.0000**	**0.6800**	**0.6800**	**2.2000e-004**	**0.0000**	**0.6855**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.3000e-004	2.4500e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8029	0.8029	2.0000e-005	0.0000	0.8033
Total	**3.3000e-004**	**2.3000e-004**	**2.4500e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8029**	**0.8029**	**2.0000e-005**	**0.0000**	**0.8033**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6000e-004	5.0000e-003	5.8300e-003	1.0000e-005		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6800	0.6800	2.2000e-004	0.0000	0.6855
Total	**2.6000e-004**	**5.0000e-003**	**5.8300e-003**	**1.0000e-005**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.6800**	**0.6800**	**2.2000e-004**	**0.0000**	**0.6855**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.3000e-004	2.4500e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8029	0.8029	2.0000e-005	0.0000	0.8033
Total	**3.3000e-004**	**2.3000e-004**	**2.4500e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8029**	**0.8029**	**2.0000e-005**	**0.0000**	**0.8033**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0300e-003	0.0161	0.0112	6.0000e-005		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	5.7825	5.7825	1.6000e-004	0.0000	5.7865
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.0300e-003**	**0.0161**	**0.0112**	**6.0000e-005**		**4.9000e-004**	**4.9000e-004**		**4.9000e-004**	**4.9000e-004**	**0.0000**	**5.7825**	**5.7825**	**1.6000e-004**	**0.0000**	**5.7865**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6400e-003	1.0000e-005	6.6000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5353	0.5353	1.0000e-005	0.0000	0.5356
Total	**2.2000e-004**	**1.5000e-004**	**1.6400e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.7000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5353**	**0.5353**	**1.0000e-005**	**0.0000**	**0.5356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3500e-003	0.0260	0.0292	6.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	5.7825	5.7825	1.6000e-004	0.0000	5.7865
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3500e-003**	**0.0260**	**0.0292**	**6.0000e-005**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**5.7825**	**5.7825**	**1.6000e-004**	**0.0000**	**5.7865**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6400e-003	1.0000e-005	6.6000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5353	0.5353	1.0000e-005	0.0000	0.5356
Total	**2.2000e-004**	**1.5000e-004**	**1.6400e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.7000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5353**	**0.5353**	**1.0000e-005**	**0.0000**	**0.5356**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.578638	0.038775	0.193686	0.110919	0.015677	0.005341	0.018293	0.026358	0.002641	0.002200	0.005832	0.000891	0.000749

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	1.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Flood Wall (Segment #3) Construction

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	1.10	1000sqft	0.03	1,100.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Flood Wall (Segment #3) Construction - San Francisco Bay Area Air Basin, Annual

Project Characteristics - Start 4/1/2022

Land Use - 1,100 sf concrete

Construction Phase - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Trips and VMT - Refer to spreadsheet (ABAG MTC 2017); Trucks calculated separately

Demolition - Negligible

Grading - Refer to spreadsheet

Construction Off-road Equipment Mitigation - watering; Tier 3, DPF level 3

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	100.00	50.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	2.00	10.00
tblConstructionPhase	NumDays	5.00	10.00
tblGrading	AcresOfGrading	0.00	0.15

tblOffRoadEquipment	HorsePower	9.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	231.00	0.00
tblOffRoadEquipment	HorsePower	89.00	0.00
tblOffRoadEquipment	HorsePower	130.00	0.00
tblOffRoadEquipment	HorsePower	80.00	0.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	158.00	25.00
tblOffRoadEquipment	HorsePower	158.00	25.00
tblOffRoadEquipment	HorsePower	158.00	25.00
tblOffRoadEquipment	HorsePower	84.00	550.00
tblOffRoadEquipment	LoadFactor	0.56	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.29	0.00
tblOffRoadEquipment	LoadFactor	0.20	0.00
tblOffRoadEquipment	LoadFactor	0.42	0.00
tblOffRoadEquipment	LoadFactor	0.38	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	4.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	2.40
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblTripsAndVMT	WorkerTripLength	10.80	15.10

tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	6.4400e-003	0.0523	0.0493	1.5000e-004	6.6000e-004	1.9900e-003	2.6500e-003	1.6000e-004	1.9100e-003	2.0700e-003	0.0000	15.0553	15.0553	1.3100e-003	0.0000	15.0882
Maximum	**6.4400e-003**	**0.0523**	**0.0493**	**1.5000e-004**	**6.6000e-004**	**1.9900e-003**	**2.6500e-003**	**1.6000e-004**	**1.9100e-003**	**2.0700e-003**	**0.0000**	**15.0553**	**15.0553**	**1.3100e-003**	**0.0000**	**15.0882**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	4.0200e-003	0.0744	0.0857	1.5000e-004	6.1000e-004	5.2000e-004	1.1300e-003	1.6000e-004	5.2000e-004	6.8000e-004	0.0000	15.0553	15.0553	1.3100e-003	0.0000	15.0881
Maximum	**4.0200e-003**	**0.0744**	**0.0857**	**1.5000e-004**	**6.1000e-004**	**5.2000e-004**	**1.1300e-003**	**1.6000e-004**	**5.2000e-004**	**6.8000e-004**	**0.0000**	**15.0553**	**15.0553**	**1.3100e-003**	**0.0000**	**15.0881**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**37.58**	**-42.35**	**-73.69**	**0.00**	**7.58**	**73.87**	**57.36**	**0.00**	**72.77**	**67.15**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Flood Wall (Segment #3) Construction - San Francisco Bay Area Air Basin, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2022	6-30-2022	0.0224	0.0236
2	7-1-2022	9-30-2022	0.0363	0.0548
		Highest	0.0363	0.0548

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Flood Wall (Segment #3) Construction - San Francisco Bay Area Air Basin, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2022	4/7/2022	5	5	
2	Grading	Grading	4/8/2022	4/21/2022	5	10	
3	Building Construction	Building Construction	4/14/2022	6/22/2022	5	50	
4	Paving	Paving	7/1/2022	7/14/2022	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.15

Acres of Paving: 0.03

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Flood Wall (Segment #3) Construction - San Francisco Bay Area Air Basin, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	0	0.00
Demolition	Excavators	1	4.00	25	0.38
Demolition	Rubber Tired Dozers	0	0.00	0	0.00
Demolition	Tractors/Loaders/Backhoes	1	4.00	67	0.37
Grading	Concrete/Industrial Saws	0	0.00	0	0.00
Grading	Excavators	1	4.00	25	0.38
Grading	Rubber Tired Dozers	0	0.00	0	0.00
Grading	Tractors/Loaders/Backhoes	1	4.00	67	0.37
Building Construction	Cranes	0	0.00	0	0.00
Building Construction	Excavators	1	2.40	25	0.38
Building Construction	Forklifts	0	0.00	0	0.00
Building Construction	Tractors/Loaders/Backhoes	1	2.40	67	0.37
Paving	Cement and Mortar Mixers	0	0.00	0	0.00
Paving	Pavers	0	0.00	0	0.00
Paving	Pumps	1	5.00	550	0.74
Paving	Rollers	0	0.00	0	0.00
Paving	Tractors/Loaders/Backhoes	0	0.00	0	0.00

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	2	5.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	2	5.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	2	0.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	1	3.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.4000e-004	2.2200e-003	2.8300e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**2.4000e-004**	**2.2200e-003**	**2.8300e-003**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1115	0.1115	0.0000	0.0000	0.1116
Total	**5.0000e-005**	**3.0000e-005**	**3.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1115**	**0.1115**	**0.0000**	**0.0000**	**0.1116**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3000e-004	2.4700e-003	2.8800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.3358	0.3358	1.1000e-004	0.0000	0.3385
Total	**1.3000e-004**	**2.4700e-003**	**2.8800e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.3358**	**0.3358**	**1.1000e-004**	**0.0000**	**0.3385**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1115	0.1115	0.0000	0.0000	0.1116
Total	**5.0000e-005**	**3.0000e-005**	**3.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1115**	**0.1115**	**0.0000**	**0.0000**	**0.1116**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.0000e-005	0.0000	8.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	4.4400e-003	5.6500e-003	1.0000e-005		2.2000e-004	2.2000e-004		2.0000e-004	2.0000e-004	0.0000	0.6716	0.6716	2.2000e-004	0.0000	0.6770
Total	**4.8000e-004**	**4.4400e-003**	**5.6500e-003**	**1.0000e-005**	**8.0000e-005**	**2.2000e-004**	**3.0000e-004**	**1.0000e-005**	**2.0000e-004**	**2.1000e-004**	**0.0000**	**0.6716**	**0.6716**	**2.2000e-004**	**0.0000**	**0.6770**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	6.0000e-005	6.8000e-004	0.0000	2.8000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	8.0000e-005	0.0000	0.2230	0.2230	0.0000	0.0000	0.2232
Total	**9.0000e-005**	**6.0000e-005**	**6.8000e-004**	**0.0000**	**2.8000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2230**	**0.2230**	**0.0000**	**0.0000**	**0.2232**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5000e-004	4.9300e-003	5.7600e-003	1.0000e-005		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6716	0.6716	2.2000e-004	0.0000	0.6770
Total	**2.5000e-004**	**4.9300e-003**	**5.7600e-003**	**1.0000e-005**	**3.0000e-005**	**5.0000e-005**	**8.0000e-005**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.6716**	**0.6716**	**2.2000e-004**	**0.0000**	**0.6770**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	6.0000e-005	6.8000e-004	0.0000	2.8000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	8.0000e-005	0.0000	0.2230	0.2230	0.0000	0.0000	0.2232
Total	**9.0000e-005**	**6.0000e-005**	**6.8000e-004**	**0.0000**	**2.8000e-004**	**0.0000**	**2.8000e-004**	**7.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2230**	**0.2230**	**0.0000**	**0.0000**	**0.2232**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4500e-003	0.0133	0.0170	2.0000e-005		6.7000e-004	6.7000e-004		6.1000e-004	6.1000e-004	0.0000	2.0147	2.0147	6.5000e-004	0.0000	2.0310
Total	**1.4500e-003**	**0.0133**	**0.0170**	**2.0000e-005**		**6.7000e-004**	**6.7000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**2.0147**	**2.0147**	**6.5000e-004**	**0.0000**	**2.0310**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.6000e-004	0.0148	0.0173	2.0000e-005		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	2.0147	2.0147	6.5000e-004	0.0000	2.0310
Total	**7.6000e-004**	**0.0148**	**0.0173**	**2.0000e-005**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**2.0147**	**2.0147**	**6.5000e-004**	**0.0000**	**2.0310**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.0600e-003	0.0321	0.0225	1.1000e-004		9.9000e-004	9.9000e-004		9.9000e-004	9.9000e-004	0.0000	11.5649	11.5649	3.3000e-004	0.0000	11.5731
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.0600e-003**	**0.0321**	**0.0225**	**1.1000e-004**		**9.9000e-004**	**9.9000e-004**		**9.9000e-004**	**9.9000e-004**	**0.0000**	**11.5649**	**11.5649**	**3.3000e-004**	**0.0000**	**11.5731**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	4.1000e-004	0.0000	1.7000e-004	0.0000	1.7000e-004	4.0000e-005	0.0000	5.0000e-005	0.0000	0.1338	0.1338	0.0000	0.0000	0.1339
Total	**6.0000e-005**	**4.0000e-005**	**4.1000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**4.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1338**	**0.1338**	**0.0000**	**0.0000**	**0.1339**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6900e-003	0.0520	0.0583	1.1000e-004		3.0000e-004	3.0000e-004		3.0000e-004	3.0000e-004	0.0000	11.5649	11.5649	3.3000e-004	0.0000	11.5730
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.6900e-003**	**0.0520**	**0.0583**	**1.1000e-004**		**3.0000e-004**	**3.0000e-004**		**3.0000e-004**	**3.0000e-004**	**0.0000**	**11.5649**	**11.5649**	**3.3000e-004**	**0.0000**	**11.5730**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	4.0000e-005	4.1000e-004	0.0000	1.7000e-004	0.0000	1.7000e-004	4.0000e-005	0.0000	5.0000e-005	0.0000	0.1338	0.1338	0.0000	0.0000	0.1339
Total	**6.0000e-005**	**4.0000e-005**	**4.1000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**1.7000e-004**	**4.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1338**	**0.1338**	**0.0000**	**0.0000**	**0.1339**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.578638	0.038775	0.193686	0.110919	0.015677	0.005341	0.018293	0.026358	0.002641	0.002200	0.005832	0.000891	0.000749

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.1000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	1.1000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	7.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**1.1000e-004**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	7.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**1.1000e-004**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Fish Pool Construction

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Fish Pool Construction - San Francisco Bay Area Air Basin, Annual

Project Characteristics - start June 15, 2022

Land Use - 5,000 sf concrete

Construction Phase - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Trips and VMT - Refer to spreadsheet (ABAG MTC 2017); Trucks calculated separately

Demolition - Refer to spreadsheet

Grading - Refer to spreadsheet

Construction Off-road Equipment Mitigation - watering; Tier 3, DPF level 3

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	25.00
tblConstructionPhase	NumDays	2.00	25.00

Fish Pool Construction - San Francisco Bay Area Air Basin, Annual

tblConstructionPhase	NumDays	5.00	65.00
tblGrading	AcresOfGrading	0.00	0.11
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	158.00	120.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	158.00	120.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	97.00	67.00
tblOffRoadEquipment	HorsePower	9.00	0.00
tblOffRoadEquipment	HorsePower	130.00	0.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	HorsePower	84.00	550.00
tblOffRoadEquipment	HorsePower	80.00	0.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.56	0.00
tblOffRoadEquipment	LoadFactor	0.42	0.00
tblOffRoadEquipment	LoadFactor	0.38	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	3.20
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblTripsAndVMT	HaulingTripNumber	70.00	0.00
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripNumber	13.00	8.00
tblTripsAndVMT	WorkerTripNumber	10.00	8.00
tblTripsAndVMT	WorkerTripNumber	5.00	8.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0857	0.5593	0.5914	1.1700e-003	0.0127	0.0222	0.0349	2.5100e-003	0.0220	0.0245	0.0000	94.4610	94.4610	9.0700e-003	0.0000	94.6876
Maximum	**0.0857**	**0.5593**	**0.5914**	**1.1700e-003**	**0.0127**	**0.0222**	**0.0349**	**2.5100e-003**	**0.0220**	**0.0245**	**0.0000**	**94.4610**	**94.4610**	**9.0700e-003**	**0.0000**	**94.6876**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0429	0.6858	0.6712	1.1700e-003	8.0600e-003	5.8600e-003	0.0139	1.8000e-003	5.8600e-003	7.6600e-003	0.0000	94.4609	94.4609	9.0700e-003	0.0000	94.6875
Maximum	**0.0429**	**0.6858**	**0.6712**	**1.1700e-003**	**8.0600e-003**	**5.8600e-003**	**0.0139**	**1.8000e-003**	**5.8600e-003**	**7.6600e-003**	**0.0000**	**94.4609**	**94.4609**	**9.0700e-003**	**0.0000**	**94.6875**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**49.95**	**-22.62**	**-13.51**	**0.00**	**36.64**	**73.59**	**60.13**	**28.29**	**73.34**	**68.72**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-15-2022	9-14-2022	0.5836	0.6525
2	9-15-2022	9-30-2022	0.0363	0.0451
		Highest	0.5836	0.6525

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0000e-004	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0000e-004	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	6/15/2022	7/19/2022	5	25	
2	Demolition	Demolition	6/29/2022	8/2/2022	5	25	
3	Paving	Paving	7/13/2022	10/11/2022	5	65	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.11

Acres of Paving: 0.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Concrete/Industrial Saws	0	0.00	0	0.00
Grading	Excavators	1	4.80	120	0.38
Grading	Pumps	2	24.00	44	0.74
Grading	Rubber Tired Dozers	1	0.00	0	0.00
Grading	Tractors/Loaders/Backhoes	1	3.20	67	0.37
Demolition	Concrete/Industrial Saws	0	0.00	0	0.00
Demolition	Excavators	1	6.00	120	0.38
Demolition	Pumps	2	24.00	44	0.74
Demolition	Rubber Tired Dozers	0	0.00	0	0.00
Demolition	Tractors/Loaders/Backhoes	1	4.00	67	0.37
Paving	Cement and Mortar Mixers	0	0.00	0	0.00
Paving	Pavers	0	0.00	0	0.00
Paving	Pumps	1	12.90	44	0.74
Paving	Pumps	1	1.50	550	0.74
Paving	Rollers	0	0.00	0	0.00
Paving	Tractors/Loaders/Backhoes	0	0.00	0	0.00

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	5	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	2	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0285	0.1872	0.2030	3.4000e-004		7.6900e-003	7.6900e-003		7.6000e-003	7.6000e-003	0.0000	25.7072	25.7072	3.2800e-003	0.0000	25.7893
Total	**0.0285**	**0.1872**	**0.2030**	**3.4000e-004**	**6.0000e-005**	**7.6900e-003**	**7.7500e-003**	**1.0000e-005**	**7.6000e-003**	**7.6100e-003**	**0.0000**	**25.7072**	**25.7072**	**3.2800e-003**	**0.0000**	**25.7893**

3.2 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	2.6000e-004	2.7300e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1100e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.8921	0.8921	2.0000e-005	0.0000	0.8926
Total	**3.7000e-004**	**2.6000e-004**	**2.7300e-003**	**1.0000e-005**	**1.1000e-003**	**1.0000e-005**	**1.1100e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.8921**	**0.8921**	**2.0000e-005**	**0.0000**	**0.8926**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0135	0.2194	0.2070	3.4000e-004		1.9700e-003	1.9700e-003		1.9700e-003	1.9700e-003	0.0000	25.7072	25.7072	3.2800e-003	0.0000	25.7892
Total	**0.0135**	**0.2194**	**0.2070**	**3.4000e-004**	**2.0000e-005**	**1.9700e-003**	**1.9900e-003**	**0.0000**	**1.9700e-003**	**1.9700e-003**	**0.0000**	**25.7072**	**25.7072**	**3.2800e-003**	**0.0000**	**25.7892**

3.2 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	2.6000e-004	2.7300e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1100e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.8921	0.8921	2.0000e-005	0.0000	0.8926
Total	**3.7000e-004**	**2.6000e-004**	**2.7300e-003**	**1.0000e-005**	**1.1000e-003**	**1.0000e-005**	**1.1100e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.8921**	**0.8921**	**2.0000e-005**	**0.0000**	**0.8926**

3.3 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.5900e-003	0.0000	7.5900e-003	1.1500e-003	0.0000	1.1500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0291	0.1925	0.2102	3.5000e-004		7.9700e-003	7.9700e-003		7.8600e-003	7.8600e-003	0.0000	26.5829	26.5829	3.5600e-003	0.0000	26.6720
Total	**0.0291**	**0.1925**	**0.2102**	**3.5000e-004**	**7.5900e-003**	**7.9700e-003**	**0.0156**	**1.1500e-003**	**7.8600e-003**	**9.0100e-003**	**0.0000**	**26.5829**	**26.5829**	**3.5600e-003**	**0.0000**	**26.6720**

3.3 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	2.6000e-004	2.7300e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1100e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.8921	0.8921	2.0000e-005	0.0000	0.8926
Total	**3.7000e-004**	**2.6000e-004**	**2.7300e-003**	**1.0000e-005**	**1.1000e-003**	**1.0000e-005**	**1.1100e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.8921**	**0.8921**	**2.0000e-005**	**0.0000**	**0.8926**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.9600e-003	0.0000	2.9600e-003	4.5000e-004	0.0000	4.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0137	0.2244	0.2146	3.5000e-004		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	26.5829	26.5829	3.5600e-003	0.0000	26.6720
Total	**0.0137**	**0.2244**	**0.2146**	**3.5000e-004**	**2.9600e-003**	**2.0100e-003**	**4.9700e-003**	**4.5000e-004**	**2.0100e-003**	**2.4600e-003**	**0.0000**	**26.5829**	**26.5829**	**3.5600e-003**	**0.0000**	**26.6720**

3.3 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	2.6000e-004	2.7300e-003	1.0000e-005	1.1000e-003	1.0000e-005	1.1100e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.8921	0.8921	2.0000e-005	0.0000	0.8926
Total	**3.7000e-004**	**2.6000e-004**	**2.7300e-003**	**1.0000e-005**	**1.1000e-003**	**1.0000e-005**	**1.1100e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.8921**	**0.8921**	**2.0000e-005**	**0.0000**	**0.8926**

3.4 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0264	0.1784	0.1656	4.3000e-004		6.5000e-003	6.5000e-003		6.5000e-003	6.5000e-003	0.0000	38.0670	38.0670	2.1400e-003	0.0000	38.1204
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0264**	**0.1784**	**0.1656**	**4.3000e-004**		**6.5000e-003**	**6.5000e-003**		**6.5000e-003**	**6.5000e-003**	**0.0000**	**38.0670**	**38.0670**	**2.1400e-003**	**0.0000**	**38.1204**

3.4 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	6.6000e-004	7.0900e-003	3.0000e-005	2.8700e-003	2.0000e-005	2.8900e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.3196	2.3196	5.0000e-005	0.0000	2.3207
Total	**9.6000e-004**	**6.6000e-004**	**7.0900e-003**	**3.0000e-005**	**2.8700e-003**	**2.0000e-005**	**2.8900e-003**	**7.6000e-004**	**2.0000e-005**	**7.8000e-004**	**0.0000**	**2.3196**	**2.3196**	**5.0000e-005**	**0.0000**	**2.3207**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0140	0.2408	0.2371	4.3000e-004		1.8400e-003	1.8400e-003		1.8400e-003	1.8400e-003	0.0000	38.0670	38.0670	2.1400e-003	0.0000	38.1204
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0140**	**0.2408**	**0.2371**	**4.3000e-004**		**1.8400e-003**	**1.8400e-003**		**1.8400e-003**	**1.8400e-003**	**0.0000**	**38.0670**	**38.0670**	**2.1400e-003**	**0.0000**	**38.1204**

3.4 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	6.6000e-004	7.0900e-003	3.0000e-005	2.8700e-003	2.0000e-005	2.8900e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.3196	2.3196	5.0000e-005	0.0000	2.3207
Total	**9.6000e-004**	**6.6000e-004**	**7.0900e-003**	**3.0000e-005**	**2.8700e-003**	**2.0000e-005**	**2.8900e-003**	**7.6000e-004**	**2.0000e-005**	**7.8000e-004**	**0.0000**	**2.3196**	**2.3196**	**5.0000e-005**	**0.0000**	**2.3207**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.578638	0.038775	0.193686	0.110919	0.015677	0.005341	0.018293	0.026358	0.002641	0.002200	0.005832	0.000891	0.000749

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.0000e-004	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Unmitigated	5.0000e-004	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Total	**4.9000e-004**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	9.0000e-005	9.0000e-005	0.0000	0.0000	1.0000e-004
Total	**4.9000e-004**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.0000**	**1.0000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Granton Park Storm Drain Pump Station Construction

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	0.52	1000sqft	0.01	520.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Granton Park Storm Drain Pump Station Construction - San Francisco Bay Area Air Basin, Annual

Project Characteristics - Start April 1, 2022

Land Use - 520 sf of concrete

Construction Phase - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Trips and VMT - Refer to spreadsheet (ABAG MTC 2017); Trucks calculated separately

Demolition - Negligible

Grading - Refer to spreadsheet

Energy Use - Refer to spreadsheet; pump energy

Construction Off-road Equipment Mitigation - watering; Tier 3, DPF level 3

Stationary Sources - Emergency Generators and Fire Pumps - Refer to spreadsheet

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	2.00	10.00

tblConstructionPhase	NumDays	100.00	15.00
tblConstructionPhase	NumDays	5.00	10.00
tblEnergyUse	T24E	0.00	502.00
tblGrading	AcresOfGrading	0.00	0.04
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	158.00	120.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	231.00	0.00
tblOffRoadEquipment	HorsePower	158.00	120.00
tblOffRoadEquipment	HorsePower	89.00	0.00
tblOffRoadEquipment	HorsePower	84.00	44.00
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tblOffRoadEquipment	HorsePower	9.00	0.00
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tblOffRoadEquipment	HorsePower	84.00	44.00
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tblOffRoadEquipment	HorsePower	97.00	0.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	201.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripNumber	5.00	12.00

tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	5.00	12.00
tblTripsAndVMT	WorkerTripNumber	5.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	8.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0185	0.1243	0.1329	2.8000e-004	2.7200e-003	4.9800e-003	7.7000e-003	7.2000e-004	4.8800e-003	5.6000e-003	0.0000	22.9596	22.9596	2.5400e-003	0.0000	23.0232
Maximum	**0.0185**	**0.1243**	**0.1329**	**2.8000e-004**	**2.7200e-003**	**4.9800e-003**	**7.7000e-003**	**7.2000e-004**	**4.8800e-003**	**5.6000e-003**	**0.0000**	**22.9596**	**22.9596**	**2.5400e-003**	**0.0000**	**23.0232**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	9.5900e-003	0.1476	0.1546	2.8000e-004	2.7000e-003	1.2100e-003	3.9100e-003	7.2000e-004	1.2100e-003	1.9300e-003	0.0000	22.9596	22.9596	2.5400e-003	0.0000	23.0231
Maximum	**9.5900e-003**	**0.1476**	**0.1546**	**2.8000e-004**	**2.7000e-003**	**1.2100e-003**	**3.9100e-003**	**7.2000e-004**	**1.2100e-003**	**1.9300e-003**	**0.0000**	**22.9596**	**22.9596**	**2.5400e-003**	**0.0000**	**23.0231**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**48.13**	**-18.76**	**-16.27**	**0.00**	**0.74**	**75.70**	**49.22**	**0.00**	**75.20**	**65.54**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2022	6-30-2022	0.1427	0.1571
		Highest	0.1427	0.1571

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	75.9395	75.9395	3.4300e-003	7.1000e-004	76.2371
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Stationary	8.2500e-003	0.0231	0.0210	4.0000e-005		1.2100e-003	1.2100e-003		1.2100e-003	1.2100e-003	0.0000	3.8270	3.8270	5.4000e-004	0.0000	3.8404
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3000e-003**	**0.0231**	**0.0210**	**4.0000e-005**	**0.0000**	**1.2100e-003**	**1.2100e-003**	**0.0000**	**1.2100e-003**	**1.2100e-003**	**0.0000**	**79.7666**	**79.7666**	**3.9700e-003**	**7.1000e-004**	**80.0775**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	75.9395	75.9395	3.4300e-003	7.1000e-004	76.2371
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Stationary	8.2500e-003	0.0231	0.0210	4.0000e-005		1.2100e-003	1.2100e-003		1.2100e-003	1.2100e-003	0.0000	3.8270	3.8270	5.4000e-004	0.0000	3.8404
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3000e-003**	**0.0231**	**0.0210**	**4.0000e-005**	**0.0000**	**1.2100e-003**	**1.2100e-003**	**0.0000**	**1.2100e-003**	**1.2100e-003**	**0.0000**	**79.7666**	**79.7666**	**3.9700e-003**	**7.1000e-004**	**80.0775**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Granton Park Storm Drain Pump Station Construction - San Francisco Bay Area Air Basin, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	4/1/2022	4/7/2022	5	5	
2	Grading	Grading	4/8/2022	4/21/2022	5	10	
3	Building Construction	Building Construction	4/21/2022	5/11/2022	5	15	
4	Paving	Paving	5/12/2022	5/25/2022	5	10	
5	Planting	Site Preparation	5/26/2022	5/26/2022	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.04

Acres of Paving: 0.01

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Granton Park Storm Drain Pump Station Construction - San Francisco Bay Area Air Basin, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Concrete/Industrial Saws	0	0.00	0	0.00
Grading	Excavators	1	6.00	120	0.38
Grading	Pumps	1	24.00	44	0.74
Grading	Rubber Tired Dozers	0	0.00	0	0.00
Grading	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Building Construction	Cranes	0	0.00	0	0.00
Building Construction	Excavators	1	2.00	120	0.38
Building Construction	Forklifts	0	0.00	0	0.00
Building Construction	Pumps	1	16.00	44	0.74
Building Construction	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Paving	Cement and Mortar Mixers	0	0.00	0	0.00
Paving	Cranes	1	3.00	326	0.29
Paving	Pavers	0	0.00	0	0.00
Paving	Pumps	1	2.50	550	0.74
Paving	Rollers	0	0.00	0	0.00
Paving	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Demolition	Concrete/Industrial Saws	0	0.00	0	0.00
Demolition	Excavators	1	6.00	120	0.38
Demolition	Pumps	1	24.00	44	0.74
Demolition	Rubber Tired Dozers	0	0.00	0	0.00
Demolition	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Planting	Graders	0	0.00	0	0.00
Planting	Tractors/Loaders/Backhoes	0	0.00	0	0.00

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Planting	0	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0200e-003	0.0205	0.0227	4.0000e-005		8.6000e-004	8.6000e-004		8.5000e-004	8.5000e-004	0.0000	2.8602	2.8602	4.2000e-004	0.0000	2.8707
Total	**3.0200e-003**	**0.0205**	**0.0227**	**4.0000e-005**		**8.6000e-004**	**8.6000e-004**		**8.5000e-004**	**8.5000e-004**	**0.0000**	**2.8602**	**2.8602**	**4.2000e-004**	**0.0000**	**2.8707**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4300e-003	0.0234	0.0232	4.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	2.8602	2.8602	4.2000e-004	0.0000	2.8707
Total	**1.4300e-003**	**0.0234**	**0.0232**	**4.0000e-005**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**	**0.0000**	**2.8602**	**2.8602**	**4.2000e-004**	**0.0000**	**2.8707**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	8.0000e-005	8.2000e-004	0.0000	3.3000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2676	0.2676	1.0000e-005	0.0000	0.2678
Total	**1.1000e-004**	**8.0000e-005**	**8.2000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2676**	**0.2676**	**1.0000e-005**	**0.0000**	**0.2678**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0500e-003	0.0410	0.0453	7.0000e-005		1.7200e-003	1.7200e-003		1.6900e-003	1.6900e-003	0.0000	5.7203	5.7203	8.4000e-004	0.0000	5.7414
Total	**6.0500e-003**	**0.0410**	**0.0453**	**7.0000e-005**	**2.0000e-005**	**1.7200e-003**	**1.7400e-003**	**0.0000**	**1.6900e-003**	**1.6900e-003**	**0.0000**	**5.7203**	**5.7203**	**8.4000e-004**	**0.0000**	**5.7414**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6400e-003	1.0000e-005	6.6000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5353	0.5353	1.0000e-005	0.0000	0.5356
Total	**2.2000e-004**	**1.5000e-004**	**1.6400e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.7000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5353**	**0.5353**	**1.0000e-005**	**0.0000**	**0.5356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8600e-003	0.0469	0.0465	7.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.7203	5.7203	8.4000e-004	0.0000	5.7414
Total	**2.8600e-003**	**0.0469**	**0.0465**	**7.0000e-005**	**1.0000e-005**	**4.1000e-004**	**4.2000e-004**	**0.0000**	**4.1000e-004**	**4.1000e-004**	**0.0000**	**5.7203**	**5.7203**	**8.4000e-004**	**0.0000**	**5.7414**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6400e-003	1.0000e-005	6.6000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5353	0.5353	1.0000e-005	0.0000	0.5356
Total	**2.2000e-004**	**1.5000e-004**	**1.6400e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.7000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5353**	**0.5353**	**1.0000e-005**	**0.0000**	**0.5356**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.6700e-003	0.0371	0.0401	7.0000e-005		1.5200e-003	1.5200e-003		1.5000e-003	1.5000e-003	0.0000	5.0806	5.0806	6.4000e-004	0.0000	5.0965
Total	**5.6700e-003**	**0.0371**	**0.0401**	**7.0000e-005**		**1.5200e-003**	**1.5200e-003**		**1.5000e-003**	**1.5000e-003**	**0.0000**	**5.0806**	**5.0806**	**6.4000e-004**	**0.0000**	**5.0965**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.3000e-004	2.4500e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8029	0.8029	2.0000e-005	0.0000	0.8033
Total	**3.3000e-004**	**2.3000e-004**	**2.4500e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8029**	**0.8029**	**2.0000e-005**	**0.0000**	**0.8033**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6800e-003	0.0434	0.0409	7.0000e-005		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	5.0806	5.0806	6.4000e-004	0.0000	5.0965
Total	**2.6800e-003**	**0.0434**	**0.0409**	**7.0000e-005**		**3.9000e-004**	**3.9000e-004**		**3.9000e-004**	**3.9000e-004**	**0.0000**	**5.0806**	**5.0806**	**6.4000e-004**	**0.0000**	**5.0965**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.3000e-004	2.3000e-004	2.4500e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8029	0.8029	2.0000e-005	0.0000	0.8033
Total	**3.3000e-004**	**2.3000e-004**	**2.4500e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8029**	**0.8029**	**2.0000e-005**	**0.0000**	**0.8033**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8500e-003	0.0251	0.0181	7.0000e-005		8.6000e-004	8.6000e-004		8.3000e-004	8.3000e-004	0.0000	7.1217	7.1217	6.0000e-004	0.0000	7.1366
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.8500e-003**	**0.0251**	**0.0181**	**7.0000e-005**		**8.6000e-004**	**8.6000e-004**		**8.3000e-004**	**8.3000e-004**	**0.0000**	**7.1217**	**7.1217**	**6.0000e-004**	**0.0000**	**7.1366**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6400e-003	1.0000e-005	6.6000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5353	0.5353	1.0000e-005	0.0000	0.5356
Total	**2.2000e-004**	**1.5000e-004**	**1.6400e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.7000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5353**	**0.5353**	**1.0000e-005**	**0.0000**	**0.5356**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7200e-003	0.0333	0.0373	7.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	7.1216	7.1216	6.0000e-004	0.0000	7.1365
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.7200e-003**	**0.0333**	**0.0373**	**7.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**	**0.0000**	**7.1216**	**7.1216**	**6.0000e-004**	**0.0000**	**7.1365**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.5000e-004	1.6400e-003	1.0000e-005	6.6000e-004	0.0000	6.7000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5353	0.5353	1.0000e-005	0.0000	0.5356
Total	**2.2000e-004**	**1.5000e-004**	**1.6400e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.7000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5353**	**0.5353**	**1.0000e-005**	**0.0000**	**0.5356**

3.6 Planting - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Planting - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0357	0.0357	0.0000	0.0000	0.0357
Total	**1.0000e-005**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0357**	**0.0357**	**0.0000**	**0.0000**	**0.0357**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Planting - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0357	0.0357	0.0000	0.0000	0.0357
Total	**1.0000e-005**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0357**	**0.0357**	**0.0000**	**0.0000**	**0.0357**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.578638	0.038775	0.193686	0.110919	0.015677	0.005341	0.018293	0.026358	0.002641	0.002200	0.005832	0.000891	0.000749

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	75.9395	75.9395	3.4300e-003	7.1000e-004	76.2371
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	75.9395	75.9395	3.4300e-003	7.1000e-004	76.2371
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	261040	75.9395	3.4300e-003	7.1000e-004	76.2371
Total		**75.9395**	**3.4300e-003**	**7.1000e-004**	**76.2371**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	261040	75.9395	3.4300e-003	7.1000e-004	76.2371
Total		**75.9395**	**3.4300e-003**	**7.1000e-004**	**76.2371**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Unmitigated	5.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Total	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Total	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	0	50	201	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (175 - 300 HP)	8.2500e-003	0.0231	0.0210	4.0000e-005		1.2100e-003	1.2100e-003		1.2100e-003	1.2100e-003	0.0000	3.8270	3.8270	5.4000e-004	0.0000	3.8404
Total	**8.2500e-003**	**0.0231**	**0.0210**	**4.0000e-005**		**1.2100e-003**	**1.2100e-003**		**1.2100e-003**	**1.2100e-003**	**0.0000**	**3.8270**	**3.8270**	**5.4000e-004**	**0.0000**	**3.8404**

11.0 Vegetation

Allen Park Construction

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	6.40	1000sqft	0.15	6,400.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Allen Park Construction - San Francisco Bay Area Air Basin, Annual

Project Characteristics - start June 1, 2022

Land Use - 6,400 sf of concrete

Construction Phase - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Trips and VMT - Refer to spreadsheet (ABAG MTC 2017); Trucks calculated separately

Demolition - Refer to spreadsheet

Grading - Refer to spreadsheet

Construction Off-road Equipment Mitigation - watering; Tier 3, DPF level 3

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	25.00
tblConstructionPhase	NumDays	2.00	50.00
tblConstructionPhase	NumDays	100.00	45.00
tblConstructionPhase	NumDays	5.00	20.00
tblConstructionPhase	NumDays	1.00	20.00
tblGrading	AcresOfGrading	5.63	1.38
tblOffRoadEquipment	HorsePower	9.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	231.00	0.00
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tblOffRoadEquipment	HorsePower	187.00	140.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	4.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	1.50
tblOffRoadEquipment	UsageHours	6.00	2.70
tblOffRoadEquipment	UsageHours	6.00	1.30
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblTripsAndVMT	HaulingTripNumber	240.00	0.00
tblTripsAndVMT	VendorTripNumber	1.00	0.00
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10

tblTripsAndVMT	WorkerTripNumber	10.00	12.00
tblTripsAndVMT	WorkerTripNumber	10.00	12.00
tblTripsAndVMT	WorkerTripNumber	3.00	12.00
tblTripsAndVMT	WorkerTripNumber	5.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	8.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0578	0.3784	0.4197	7.7000e-004	0.0369	0.0163	0.0532	6.7200e-003	0.0159	0.0226	0.0000	61.4071	61.4071	7.9500e-003	0.0000	61.6058
Maximum	**0.0578**	**0.3784**	**0.4197**	**7.7000e-004**	**0.0369**	**0.0163**	**0.0532**	**6.7200e-003**	**0.0159**	**0.0226**	**0.0000**	**61.4071**	**61.4071**	**7.9500e-003**	**0.0000**	**61.6058**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0283	0.4176	0.4433	7.7000e-004	0.0206	3.6800e-003	0.0243	4.2700e-003	3.6800e-003	7.9400e-003	0.0000	61.4070	61.4070	7.9500e-003	0.0000	61.6057
Maximum	**0.0283**	**0.4176**	**0.4433**	**7.7000e-004**	**0.0206**	**3.6800e-003**	**0.0243**	**4.2700e-003**	**3.6800e-003**	**7.9400e-003**	**0.0000**	**61.4070**	**61.4070**	**7.9500e-003**	**0.0000**	**61.6057**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**50.98**	**-10.34**	**-5.62**	**0.00**	**44.19**	**77.42**	**54.37**	**36.46**	**76.80**	**64.84**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2022	8-31-2022	0.4146	0.4171
2	9-1-2022	9-30-2022	0.0210	0.0282
		Highest	0.4146	0.4171

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	6.4000e-004	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	6.4000e-004	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2022	7/5/2022	5	25	
2	Grading	Grading	6/15/2022	8/23/2022	5	50	
3	Building Construction	Building Construction	7/1/2022	9/1/2022	5	45	
4	Paving	Paving	8/31/2022	9/27/2022	5	20	
5	Planting	Site Preparation	9/28/2022	10/25/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1.38

Acres of Paving: 0.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Allen Park Construction - San Francisco Bay Area Air Basin, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	0	0.00
Demolition	Excavators	1	3.20	120	0.38
Demolition	Graders	1	3.60	140	0.41
Demolition	Pumps	1	24.00	44	0.74
Demolition	Rubber Tired Dozers	0	0.00	0	0.00
Demolition	Tractors/Loaders/Backhoes	1	2.70	67	0.37
Grading	Concrete/Industrial Saws	0	0.00	0	0.00
Grading	Excavators	1	1.60	120	0.38
Grading	Graders	1	1.80	140	0.41
Grading	Pumps	1	24.00	44	0.74
Grading	Rubber Tired Dozers	0	0.00	0	0.00
Grading	Tractors/Loaders/Backhoes	1	1.30	67	0.37
Building Construction	Cranes	0	0.00	0	0.00
Building Construction	Excavators	1	1.80	120	0.38
Building Construction	Forklifts	0	0.00	0	0.00
Building Construction	Graders	0	0.00	0	0.00
Building Construction	Pumps	1	2.70	44	0.74
Building Construction	Tractors/Loaders/Backhoes	1	1.50	67	0.37
Paving	Cement and Mortar Mixers	0	0.00	0	0.00
Paving	Pavers	0	0.00	0	0.00
Paving	Pumps	1	1.00	550	0.74
Paving	Rollers	1	4.00	36	0.38
Paving	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Planting	Graders	0	0.00	0	0.00
Planting	Tractors/Loaders/Backhoes	0	0.00	0	0.00

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	2	12.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Planting	0	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0260	0.0000	0.0260	3.9400e-003	0.0000	3.9400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0172	0.1217	0.1276	2.1000e-004		5.3900e-003	5.3900e-003		5.2200e-003	5.2200e-003	0.0000	16.0768	16.0768	2.6800e-003	0.0000	16.1439
Total	**0.0172**	**0.1217**	**0.1276**	**2.1000e-004**	**0.0260**	**5.3900e-003**	**0.0314**	**3.9400e-003**	**5.2200e-003**	**9.1600e-003**	**0.0000**	**16.0768**	**16.0768**	**2.6800e-003**	**0.0000**	**16.1439**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.6000e-004	3.8000e-004	4.0900e-003	1.0000e-005	1.6600e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3382	1.3382	3.0000e-005	0.0000	1.3389
Total	**5.6000e-004**	**3.8000e-004**	**4.0900e-003**	**1.0000e-005**	**1.6600e-003**	**1.0000e-005**	**1.6700e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3382**	**1.3382**	**3.0000e-005**	**0.0000**	**1.3389**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0101	0.0000	0.0101	1.5400e-003	0.0000	1.5400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.6300e-003	0.1273	0.1311	2.1000e-004		1.1200e-003	1.1200e-003		1.1200e-003	1.1200e-003	0.0000	16.0768	16.0768	2.6800e-003	0.0000	16.1439
Total	**7.6300e-003**	**0.1273**	**0.1311**	**2.1000e-004**	**0.0101**	**1.1200e-003**	**0.0113**	**1.5400e-003**	**1.1200e-003**	**2.6600e-003**	**0.0000**	**16.0768**	**16.0768**	**2.6800e-003**	**0.0000**	**16.1439**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.6000e-004	3.8000e-004	4.0900e-003	1.0000e-005	1.6600e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3382	1.3382	3.0000e-005	0.0000	1.3389
Total	**5.6000e-004**	**3.8000e-004**	**4.0900e-003**	**1.0000e-005**	**1.6600e-003**	**1.0000e-005**	**1.6700e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3382**	**1.3382**	**3.0000e-005**	**0.0000**	**1.3389**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.3000e-004	0.0000	7.3000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0304	0.2043	0.2145	3.6000e-004		8.6600e-003	8.6600e-003		8.4900e-003	8.4900e-003	0.0000	27.1496	27.1496	3.7500e-003	0.0000	27.2433
Total	**0.0304**	**0.2043**	**0.2145**	**3.6000e-004**	**7.3000e-004**	**8.6600e-003**	**9.3900e-003**	**8.0000e-005**	**8.4900e-003**	**8.5700e-003**	**0.0000**	**27.1496**	**27.1496**	**3.7500e-003**	**0.0000**	**27.2433**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1100e-003	7.7000e-004	8.1800e-003	3.0000e-005	3.3100e-003	2.0000e-005	3.3300e-003	8.8000e-004	2.0000e-005	9.0000e-004	0.0000	2.6764	2.6764	5.0000e-005	0.0000	2.6778
Total	**1.1100e-003**	**7.7000e-004**	**8.1800e-003**	**3.0000e-005**	**3.3100e-003**	**2.0000e-005**	**3.3300e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**2.6764**	**2.6764**	**5.0000e-005**	**0.0000**	**2.6778**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.9000e-004	0.0000	2.9000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0139	0.2268	0.2191	3.6000e-004		2.0200e-003	2.0200e-003		2.0200e-003	2.0200e-003	0.0000	27.1496	27.1496	3.7500e-003	0.0000	27.2433
Total	**0.0139**	**0.2268**	**0.2191**	**3.6000e-004**	**2.9000e-004**	**2.0200e-003**	**2.3100e-003**	**3.0000e-005**	**2.0200e-003**	**2.0500e-003**	**0.0000**	**27.1496**	**27.1496**	**3.7500e-003**	**0.0000**	**27.2433**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1100e-003	7.7000e-004	8.1800e-003	3.0000e-005	3.3100e-003	2.0000e-005	3.3300e-003	8.8000e-004	2.0000e-005	9.0000e-004	0.0000	2.6764	2.6764	5.0000e-005	0.0000	2.6778
Total	**1.1100e-003**	**7.7000e-004**	**8.1800e-003**	**3.0000e-005**	**3.3100e-003**	**2.0000e-005**	**3.3300e-003**	**8.8000e-004**	**2.0000e-005**	**9.0000e-004**	**0.0000**	**2.6764**	**2.6764**	**5.0000e-005**	**0.0000**	**2.6778**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.1800e-003	0.0323	0.0383	6.0000e-005		1.4900e-003	1.4900e-003		1.4200e-003	1.4200e-003	0.0000	4.7718	4.7718	1.0300e-003	0.0000	4.7976
Total	**4.1800e-003**	**0.0323**	**0.0383**	**6.0000e-005**		**1.4900e-003**	**1.4900e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**4.7718**	**4.7718**	**1.0300e-003**	**0.0000**	**4.7976**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	6.9000e-004	7.3600e-003	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.4088	2.4088	5.0000e-005	0.0000	2.4100
Total	**1.0000e-003**	**6.9000e-004**	**7.3600e-003**	**3.0000e-005**	**2.9800e-003**	**2.0000e-005**	**3.0000e-003**	**7.9000e-004**	**2.0000e-005**	**8.1000e-004**	**0.0000**	**2.4088**	**2.4088**	**5.0000e-005**	**0.0000**	**2.4100**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9700e-003	0.0347	0.0398	6.0000e-005		3.0000e-004	3.0000e-004		3.0000e-004	3.0000e-004	0.0000	4.7718	4.7718	1.0300e-003	0.0000	4.7976
Total	**1.9700e-003**	**0.0347**	**0.0398**	**6.0000e-005**		**3.0000e-004**	**3.0000e-004**		**3.0000e-004**	**3.0000e-004**	**0.0000**	**4.7718**	**4.7718**	**1.0300e-003**	**0.0000**	**4.7976**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	6.9000e-004	7.3600e-003	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.4088	2.4088	5.0000e-005	0.0000	2.4100
Total	**1.0000e-003**	**6.9000e-004**	**7.3600e-003**	**3.0000e-005**	**2.9800e-003**	**2.0000e-005**	**3.0000e-003**	**7.9000e-004**	**2.0000e-005**	**8.1000e-004**	**0.0000**	**2.4088**	**2.4088**	**5.0000e-005**	**0.0000**	**2.4100**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5100e-003	0.0178	0.0143	5.0000e-005		7.0000e-004	7.0000e-004		6.7000e-004	6.7000e-004	0.0000	5.2013	5.2013	3.2000e-004	0.0000	5.2092
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5100e-003**	**0.0178**	**0.0143**	**5.0000e-005**		**7.0000e-004**	**7.0000e-004**		**6.7000e-004**	**6.7000e-004**	**0.0000**	**5.2013**	**5.2013**	**3.2000e-004**	**0.0000**	**5.2092**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	3.1000e-004	3.2700e-003	1.0000e-005	1.3300e-003	1.0000e-005	1.3300e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.0706	1.0706	2.0000e-005	0.0000	1.0711
Total	**4.4000e-004**	**3.1000e-004**	**3.2700e-003**	**1.0000e-005**	**1.3300e-003**	**1.0000e-005**	**1.3300e-003**	**3.5000e-004**	**1.0000e-005**	**3.6000e-004**	**0.0000**	**1.0706**	**1.0706**	**2.0000e-005**	**0.0000**	**1.0711**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4300e-003	0.0264	0.0283	5.0000e-005		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	5.2013	5.2013	3.2000e-004	0.0000	5.2092
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.4300e-003**	**0.0264**	**0.0283**	**5.0000e-005**		**1.7000e-004**	**1.7000e-004**		**1.7000e-004**	**1.7000e-004**	**0.0000**	**5.2013**	**5.2013**	**3.2000e-004**	**0.0000**	**5.2092**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	3.1000e-004	3.2700e-003	1.0000e-005	1.3300e-003	1.0000e-005	1.3300e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.0706	1.0706	2.0000e-005	0.0000	1.0711
Total	**4.4000e-004**	**3.1000e-004**	**3.2700e-003**	**1.0000e-005**	**1.3300e-003**	**1.0000e-005**	**1.3300e-003**	**3.5000e-004**	**1.0000e-005**	**3.6000e-004**	**0.0000**	**1.0706**	**1.0706**	**2.0000e-005**	**0.0000**	**1.0711**

3.6 Planting - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Planting - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.0000e-004	2.1800e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.9000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7137	0.7137	1.0000e-005	0.0000	0.7141
Total	**3.0000e-004**	**2.0000e-004**	**2.1800e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.9000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7137**	**0.7137**	**1.0000e-005**	**0.0000**	**0.7141**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Planting - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.0000e-004	2.1800e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.9000e-004	2.4000e-004	1.0000e-005	2.4000e-004	0.0000	0.7137	0.7137	1.0000e-005	0.0000	0.7141
Total	**3.0000e-004**	**2.0000e-004**	**2.1800e-003**	**1.0000e-005**	**8.8000e-004**	**1.0000e-005**	**8.9000e-004**	**2.4000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7137**	**0.7137**	**1.0000e-005**	**0.0000**	**0.7141**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.578638	0.038775	0.193686	0.110919	0.015677	0.005341	0.018293	0.026358	0.002641	0.002200	0.005832	0.000891	0.000749

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	6.4000e-004	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Unmitigated	6.4000e-004	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Total	**6.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.1000e-004	1.1000e-004	0.0000	0.0000	1.2000e-004
Total	**6.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Unit 4 Improvements

San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	3.63	1000sqft	0.08	3,625.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Unit 4 Improvements - San Francisco Bay Area Air Basin, Annual

Project Characteristics - start June 15, 2022

Land Use - 3,625 sf concrete

Construction Phase - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Off-road Equipment - Refer to spreadsheet

Trips and VMT - Refer to spreadsheet (ABAG MTC 2017); Trucks calculated separately

Demolition - Negligible

Grading - Refer to spreadsheet

Construction Off-road Equipment Mitigation - watering; Tier 3, DPF level 3

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	2.00	35.00
tblConstructionPhase	NumDays	100.00	10.00
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	NumDays	1.00	5.00
tblGrading	AcresOfGrading	0.00	0.23
tblLandUse	LandUseSquareFeet	3,630.00	3,625.00

tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	158.00	120.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	81.00	0.00
tblOffRoadEquipment	HorsePower	158.00	120.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	HorsePower	247.00	0.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	231.00	0.00
tblOffRoadEquipment	HorsePower	158.00	120.00
tblOffRoadEquipment	HorsePower	89.00	0.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	HorsePower	9.00	0.00
tblOffRoadEquipment	HorsePower	130.00	0.00
tblOffRoadEquipment	HorsePower	84.00	44.00
tblOffRoadEquipment	HorsePower	84.00	550.00
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tblOffRoadEquipment	HorsePower	187.00	0.00
tblOffRoadEquipment	HorsePower	97.00	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00
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tblOffRoadEquipment	LoadFactor	0.37	0.00
tblOffRoadEquipment	LoadFactor	0.73	0.00

tblOffRoadEquipment	LoadFactor	0.40	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.00
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tblOffRoadEquipment	LoadFactor	0.37	0.00
tblOffRoadEquipment	LoadFactor	0.41	0.00
tblOffRoadEquipment	LoadFactor	0.37	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00

tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	1.00	0.00
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tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblTripsAndVMT	VendorTripNumber	1.00	0.00
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripLength	10.80	15.10
tblTripsAndVMT	WorkerTripNumber	5.00	8.00
tblTripsAndVMT	WorkerTripNumber	5.00	8.00
tblTripsAndVMT	WorkerTripNumber	2.00	8.00
tblTripsAndVMT	WorkerTripNumber	5.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	8.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0385	0.2498	0.2630	5.3000e-004	2.9900e-003	9.8200e-003	0.0128	7.8000e-004	9.7400e-003	0.0105	0.0000	43.4940	43.4940	3.9100e-003	0.0000	43.5917
Maximum	**0.0385**	**0.2498**	**0.2630**	**5.3000e-004**	**2.9900e-003**	**9.8200e-003**	**0.0128**	**7.8000e-004**	**9.7400e-003**	**0.0105**	**0.0000**	**43.4940**	**43.4940**	**3.9100e-003**	**0.0000**	**43.5917**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0195	0.3082	0.3032	5.3000e-004	2.9200e-003	2.6000e-003	5.5200e-003	7.7000e-004	2.6000e-003	3.3700e-003	0.0000	43.4939	43.4939	3.9100e-003	0.0000	43.5917
Maximum	**0.0195**	**0.3082**	**0.3032**	**5.3000e-004**	**2.9200e-003**	**2.6000e-003**	**5.5200e-003**	**7.7000e-004**	**2.6000e-003**	**3.3700e-003**	**0.0000**	**43.4939**	**43.4939**	**3.9100e-003**	**0.0000**	**43.5917**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**49.42**	**-23.40**	**-15.26**	**0.00**	**2.34**	**73.52**	**56.91**	**1.28**	**73.31**	**67.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-15-2022	9-14-2022	0.2882	0.3276
		Highest	0.2882	0.3276

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.6000e-004	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.6000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0000**	**7.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.6000e-004	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.6000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0000**	**7.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Unit 4 Improvements - San Francisco Bay Area Air Basin, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/15/2022	6/21/2022	5	5	
2	Grading	Grading	6/22/2022	8/9/2022	5	35	
3	Building Construction	Building Construction	8/3/2022	8/16/2022	5	10	
4	Paving	Paving	8/10/2022	8/23/2022	5	10	
5	Planting	Site Preparation	8/24/2022	8/30/2022	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.23

Acres of Paving: 0.08

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Unit 4 Improvements - San Francisco Bay Area Air Basin, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	0	0.00	0	0.00
Demolition	Excavators	1	8.00	120	0.38
Demolition	Pumps	1	24.00	44	0.74
Demolition	Rubber Tired Dozers	0	0.00	0	0.00
Demolition	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Grading	Concrete/Industrial Saws	0	0.00	0	0.00
Grading	Excavators	1	1.40	120	0.38
Grading	Pumps	1	24.00	44	0.74
Grading	Rubber Tired Dozers	0	0.00	0	0.00
Grading	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Building Construction	Cranes	0	0.00	0	0.00
Building Construction	Excavators	1	5.00	120	0.38
Building Construction	Forklifts	0	0.00	0	0.00
Building Construction	Pumps	1	24.00	44	0.74
Building Construction	Tractors/Loaders/Backhoes	0	0.00	0	0.37
Paving	Cement and Mortar Mixers	0	0.00	0	0.00
Paving	Pavers	0	0.00	0	0.00
Paving	Pumps	1	24.00	44	0.74
Paving	Pumps	1	5.00	550	0.74
Paving	Rollers	0	0.00	0	0.00
Paving	Tractors/Loaders/Backhoes	0	0.00	0	0.00
Planting	Graders	0	0.00	0	0.00
Planting	Tractors/Loaders/Backhoes	0	0.00	0	0.00

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	2	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	2	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	2	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	2	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Planting	0	8.00	0.00	0.00	15.10	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.1500e-003	0.0218	0.0244	4.0000e-005		9.3000e-004	9.3000e-004		9.1000e-004	9.1000e-004	0.0000	3.0734	3.0734	4.9000e-004	0.0000	3.0857
Total	**3.1500e-003**	**0.0218**	**0.0244**	**4.0000e-005**		**9.3000e-004**	**9.3000e-004**		**9.1000e-004**	**9.1000e-004**	**0.0000**	**3.0734**	**3.0734**	**4.9000e-004**	**0.0000**	**3.0857**

3.2 Demolition - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.5000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1784	0.1784	0.0000	0.0000	0.1785
Total	**7.0000e-005**	**5.0000e-005**	**5.5000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1784**	**0.1784**	**0.0000**	**0.0000**	**0.1785**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4900e-003	0.0246	0.0251	4.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	3.0734	3.0734	4.9000e-004	0.0000	3.0857
Total	**1.4900e-003**	**0.0246**	**0.0251**	**4.0000e-005**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**	**0.0000**	**3.0734**	**3.0734**	**4.9000e-004**	**0.0000**	**3.0857**

3.2 Demolition - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.5000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1784	0.1784	0.0000	0.0000	0.1785
Total	**7.0000e-005**	**5.0000e-005**	**5.5000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1784**	**0.1784**	**0.0000**	**0.0000**	**0.1785**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2000e-004	0.0000	1.2000e-004	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0191	0.1224	0.1306	2.2000e-004		4.9200e-003	4.9200e-003		4.8900e-003	4.8900e-003	0.0000	16.5881	16.5881	1.8400e-003	0.0000	16.6341
Total	**0.0191**	**0.1224**	**0.1306**	**2.2000e-004**	**1.2000e-004**	**4.9200e-003**	**5.0400e-003**	**1.0000e-005**	**4.8900e-003**	**4.9000e-003**	**0.0000**	**16.5881**	**16.5881**	**1.8400e-003**	**0.0000**	**16.6341**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.6000e-004	3.8200e-003	1.0000e-005	1.5500e-003	1.0000e-005	1.5600e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2490	1.2490	3.0000e-005	0.0000	1.2496
Total	**5.2000e-004**	**3.6000e-004**	**3.8200e-003**	**1.0000e-005**	**1.5500e-003**	**1.0000e-005**	**1.5600e-003**	**4.1000e-004**	**1.0000e-005**	**4.2000e-004**	**0.0000**	**1.2490**	**1.2490**	**3.0000e-005**	**0.0000**	**1.2496**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0400e-003	0.1453	0.1327	2.2000e-004		1.3100e-003	1.3100e-003		1.3100e-003	1.3100e-003	0.0000	16.5881	16.5881	1.8400e-003	0.0000	16.6341
Total	**9.0400e-003**	**0.1453**	**0.1327**	**2.2000e-004**	**5.0000e-005**	**1.3100e-003**	**1.3600e-003**	**1.0000e-005**	**1.3100e-003**	**1.3200e-003**	**0.0000**	**16.5881**	**16.5881**	**1.8400e-003**	**0.0000**	**16.6341**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.6000e-004	3.8200e-003	1.0000e-005	1.5500e-003	1.0000e-005	1.5600e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2490	1.2490	3.0000e-005	0.0000	1.2496
Total	**5.2000e-004**	**3.6000e-004**	**3.8200e-003**	**1.0000e-005**	**1.5500e-003**	**1.0000e-005**	**1.5600e-003**	**4.1000e-004**	**1.0000e-005**	**4.2000e-004**	**0.0000**	**1.2490**	**1.2490**	**3.0000e-005**	**0.0000**	**1.2496**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9200e-003	0.0397	0.0436	7.0000e-005		1.6500e-003	1.6500e-003		1.6300e-003	1.6300e-003	0.0000	5.5071	5.5071	7.7000e-004	0.0000	5.5265
Total	**5.9200e-003**	**0.0397**	**0.0436**	**7.0000e-005**		**1.6500e-003**	**1.6500e-003**		**1.6300e-003**	**1.6300e-003**	**0.0000**	**5.5071**	**5.5071**	**7.7000e-004**	**0.0000**	**5.5265**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.0000e-004	1.0900e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3569	0.3569	1.0000e-005	0.0000	0.3570
Total	**1.5000e-004**	**1.0000e-004**	**1.0900e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3569**	**0.3569**	**1.0000e-005**	**0.0000**	**0.3570**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8000e-003	0.0457	0.0446	7.0000e-005		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	5.5071	5.5071	7.7000e-004	0.0000	5.5265
Total	**2.8000e-003**	**0.0457**	**0.0446**	**7.0000e-005**		**4.0000e-004**	**4.0000e-004**		**4.0000e-004**	**4.0000e-004**	**0.0000**	**5.5071**	**5.5071**	**7.7000e-004**	**0.0000**	**5.5265**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.0000e-004	1.0900e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3569	0.3569	1.0000e-005	0.0000	0.3570
Total	**1.5000e-004**	**1.0000e-004**	**1.0900e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3569**	**0.3569**	**1.0000e-005**	**0.0000**	**0.3570**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3500e-003	0.0653	0.0573	1.7000e-004		2.3000e-003	2.3000e-003		2.3000e-003	2.3000e-003	0.0000	16.0058	16.0058	7.6000e-004	0.0000	16.0247
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.3500e-003**	**0.0653**	**0.0573**	**1.7000e-004**		**2.3000e-003**	**2.3000e-003**		**2.3000e-003**	**2.3000e-003**	**0.0000**	**16.0058**	**16.0058**	**7.6000e-004**	**0.0000**	**16.0247**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.0000e-004	1.0900e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3569	0.3569	1.0000e-005	0.0000	0.3570
Total	**1.5000e-004**	**1.0000e-004**	**1.0900e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3569**	**0.3569**	**1.0000e-005**	**0.0000**	**0.3570**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.1900e-003	0.0919	0.0936	1.7000e-004		6.6000e-004	6.6000e-004		6.6000e-004	6.6000e-004	0.0000	16.0058	16.0058	7.6000e-004	0.0000	16.0247
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.1900e-003**	**0.0919**	**0.0936**	**1.7000e-004**		**6.6000e-004**	**6.6000e-004**		**6.6000e-004**	**6.6000e-004**	**0.0000**	**16.0058**	**16.0058**	**7.6000e-004**	**0.0000**	**16.0247**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.0000e-004	1.0900e-003	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3569	0.3569	1.0000e-005	0.0000	0.3570
Total	**1.5000e-004**	**1.0000e-004**	**1.0900e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3569**	**0.3569**	**1.0000e-005**	**0.0000**	**0.3570**

3.6 Planting - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Planting - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.5000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1784	0.1784	0.0000	0.0000	0.1785
Total	**7.0000e-005**	**5.0000e-005**	**5.5000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1784**	**0.1784**	**0.0000**	**0.0000**	**0.1785**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Planting - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	5.0000e-005	5.5000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1784	0.1784	0.0000	0.0000	0.1785
Total	**7.0000e-005**	**5.0000e-005**	**5.5000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1784**	**0.1784**	**0.0000**	**0.0000**	**0.1785**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.578638	0.038775	0.193686	0.110919	0.015677	0.005341	0.018293	0.026358	0.002641	0.002200	0.005832	0.000891	0.000749

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.6000e-004	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Unmitigated	3.6000e-004	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.3000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.3000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Total	**3.6000e-004**	**0.0000**	**3.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0000**	**7.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.3000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.3000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Total	**3.6000e-004**	**0.0000**	**3.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0000**	**7.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix C

Air Quality Supporting Information

Air Quality Emissions Assumptions and Calculations

CalEEMod Emissions Model Results

Health Risk Assessment

CORTE MADERA CREEK FLOOD RISK MANAGEMENT PROJECT PHASE 1

HEALTH RISK ASSESSMENT

Table of Contents

1 Introduction 5
1.1 Report Organization 5
2 Toxic Air Contaminants and Emissions 6
2.1 Toxic Air Contaminants 6
2.2 Emission Estimates 6
3 Air Dispersion Modeling 8
4 Exposure Factors and Toxicity Factors 10
4.1 Exposure Factors 10
4.2 Toxicity Assessment 11
5 Results 14
5.1 Project Construction and Operation HRA Results 14
5.2 BAAQMD Nearby Sources 14
6 References 15

Figures

Figure 1: Location and Windrose Gnoss Airport

Figure 2: Receptor Grid

Figure 3: Model Sources

Figure 4: Model Sources Northern End Zoom In

Figure 5: Model Sources Southern End Zoom In

Figure 6: Construction Residential Cancer Risk

Figure 7: Construction Chronic and Acute HI

Figure 8: Emergency Generator Cancer Risk

Figure 9: Construction PM 2.5 Concentration

Figure 10: BAAQMD Permitted Facilities

Tables

Table 1: Construction Equipment Emission Rates

Table 2: Road Sources Emission Rates

Table 3: Distribution of Vehicle Trips to Road Segments

Table 4: Operational Emission Rates and Source Parameters

Table 5: Speciation Factors

Table 6: Receptors

Table 7: Source Location and Parameters

Table 8: Exposure Factors

Table 9: Toxicity Factors

Table 10: Health Risk Assessment Results at MEIR

Table 11: BAAQMD Permitted Sources

Table 12: Estimate of Cumulative Risk

Acronyms

ASF	Age Specific Factor
BAAQMD	Bay Area Air Quality Management District
CalEEMod	California Emission Estimator Model
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CPF	Cancer Potency Factor
DBR	Daily Breathing Rate
DEM	Digital Elevation Model
DPM	Diesel Particulate Matter
HI	Hazard Index
HQ	Hazard Quotient
HRA	Health Risk Assessment
MEIR	Maximum Exposed Individual Receptor
MSA	Metropolitan Statistical Area
OEHHA	Office of Environmental Health Hazard Assessment
PM2.5	Particulate Matter of aerodynamic diameter less than 2.5 micrometers
RAGS	Risk Assessment Guidelines for Superfund
REL	Relative Exposure Limit
SCAQMD	South Coast Air Quality Management District
TAC	Toxic Air Contaminant
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency

1 Introduction

The Marin County Flood Control and Water Conservation District (the District) and the Friends of Corte Madera Creek Watershed, propose the Corte Madera Creek Flood Risk Management Project, Phase 1 (the project). The District is the California Environmental Quality Act (CEQA) Lead Agency responsible for preparation of this EIR. The proposed project includes improvements to the concrete Corte Madera Creek flood control channel constructed by the US Army Corps of Engineers (USACE) in the 1960s and 1970s. The project improvements would be located within the Town of Ross and unincorporated Kentfield. The proposed channel improvements would improve fish passage and provide 25-year flood risk reduction to residents and businesses within the Town of Ross and Kentfield.

The project construction activities and operation of the 150-kW backup power generator at the new stormwater pump station will emit toxic air contaminants (TACs). A health risk assessment (HRA) was conducted in order to evaluate the potential health impacts from these sources of TACs. This report details the key assumptions and results of the HRA conducted following the Office of Environmental Health Hazard Assessment (OEHHA), California Air Resources Board (CARB) and Bay Area Air Quality Management District (BAAQMD) HRA guidelines.

1.1 Report Organization

This report describes the methodology used to estimate TAC emissions, conduct air dispersion modeling, and determine exposure factors and toxicity that are the key inputs into a HRA. The report is organized in to the following key sections:

- Toxic Air Contaminants and Emissions
- Air Dispersion Modeling
- Exposure Factors and Toxicity Factors
- HRA Results

2 Toxic Air Contaminants and Emissions

2.1 Toxic Air Contaminants

One of the first steps in a HRA is to identify the potential chemicals of concern. OEHHA has identified a list of chemicals that are identified in California as toxic air contaminants and have determined appropriate toxicity factors for these chemicals for use in HRAs. The chemicals of concern during Project construction are from the combustion of fossil fueled construction equipment, material hauling vehicles and worker vehicles. During normal Project operation, the emergency generator for the pump station would emit diesel exhaust during routine testing and maintenance activities.

Diesel exhaust is a complex mixture that includes hundreds of individual constituents and is identified by the State of California as a known carcinogen and it also has chronic health effects. Diesel particulate matter (DPM) could be emitted from the construction equipment, material hauling vehicles, worker vehicles and the emergency diesel generators during periodic testing. Various gasoline fuel-related toxic air contaminants (TACs) would be emitted from gasoline fueled vehicles. Specifically, TACs such as benzene, toluene, ethylbenzene, 1,3-butadiene, and xylenes may be emitted from the gasoline vehicles.

The analysis also evaluates the concentration of Particulate Matter of aerodynamic diameter less than 2.5 micrometers (PM2.5). While PM2.5 is not a TAC, it is part of BAAQMD's CEQA significance thresholds for risks and hazards. It is assumed that all vehicle exhaust including DPM is PM2.5. In addition, fugitive dust from construction activities, tire and brake wear as well as dust from traveling on paved roads are also included in the PM2.5 emissions used to estimate PM2.5 concentrations.

2.2 Emission Estimates

For the HRA, TAC emissions need to be estimated for each individual area where the emissions will occur. For construction emissions, this means the work areas that the construction equipment will work in during a specific phase, and specific roads that vehicles will travel along. For operational emissions, the emissions associated with routine testing and maintenance of the emergency generator are estimated. Emergency use of the generator is not considered as it is unpredictable and uncertain and therefore not typically included in a HRA.

Construction emissions were estimated using off-road construction emission factors used in California Emissions Estimator Model (CalEEMod) version 2016.3.2. The emission factors were combined with the horsepower, load factor and hours of use during the construction phase to give the emissions for a specific construction work area. For use in air dispersion modeling, the emissions were converted to an emission rate in terms of grams per second. The emission rate from construction equipment for each work area is shown in **Table 1**. Fugitive dust emissions

from construction activity was also calculated based on CalEEMod version 2016.3.2 methods. Vehicle emissions were estimated using on-road emission factors from EMFAC2017. The vehicle emission factor was multiplied by the length of the specific road segment it would drive along for distance-based emission factors and number of trips for trip-based emission factors. The emissions were converted to an emission rate in terms of grams per second. The emission rate from vehicles on each road segment is shown in **Table 2**. Roads were only modeled in the immediate vicinity of the project site. In general, this was modeling roads from Lagunitas Road at the northern end of the project along Sir Francis Drake Boulevard to Bon Air Road and College Avenue and Magnolia Avenue to Bon Air Road at the southern end of the project. **Table 3** shows the assumed distribution of vehicle trips on the different road segments for each phase. **Table 4** shows the speciation factors used to determine gasoline TAC emissions from total organic gases. **Table 4** also shows the speciation used only for acute health impacts of diesel particulate matter.

The emissions for the emergency generator testing were estimated using California Emissions Estimator Model (CalEEMod) version 2016.3.2; it was assumed that the generator would be in operation for 1 hour on 50 days per year. For chronic health impacts and cancer assessments, the emissions were amortized over a year. The total emissions were converted to an emission rate in terms of grams per second. **Table 5** shows the generator emission rate.

3 Air Dispersion Modeling

The dispersion of emissions in ambient air was simulated using the U.S. Environmental Protection Agency's (USEPA's) approved model, AERMOD version 19121, which is an air dispersion model that is approved by the BAAQMD for air dispersion assessments. AERMOD was used to estimate levels of TACs at sensitive receptor locations from the project's construction and operation as well as PM2.5 concentrations. The model inputs and assumptions are summarized below.

Emission Rate: A unit emission rate was used in the AERMOD analysis, which allows for the AERMOD results or dispersion factors to be multiplied by project-specific emission rates to identify the project-specific ambient air concentrations.

Meteorological Data: AERMOD ready meteorological data using for the Gnoss Field Airport surface station and Oakland International Airport for upper air station was used for 2009-2013 calendar years which represents five years of meteorological data. This was obtained from the California Air Resources Board (CARB) Hot Spots Analysis & Report Program website list of AERMOD Meteorological Files (CARB 2020a). **Figure 1** shows the location of the surface meteorological station relative to the project site as well as showing a wind rose of the wind speeds used in the modeling.

Terrain: AERMOD uses the preprocessor AERMAP to incorporate terrain elevation into the model. A Digital Elevation Model (DEM) for San Rafael at 30-meter resolution was used (CARB 2020b).

Urban Source Designation: AERMOD allows the option to designate sources as urban or rural. Selecting the urban options accounts for heat island effects. This requires the user to enter a population for the area. AERMOD's Implementation Guide suggests using the Metropolitan Statistical Area (MSA) which for this project which is San Rafael with a population of 258,826 (USEPA 2019). The default surface roughness of 1 meter was used.

Receptors: Receptors were modeled at 25-meter increments from the sources out to 500 meters. **Table 6** shows the coordinates of the receptors. **Figure 2** shows the receptor grid used in the modeling.

Source Parameters: Emergency generators were modeled as point sources. Point sources are represented by defining the stack height, stack diameter, exhaust temperature and exhaust flow rate. Typical values for emergency generators were used for the point source parameters. Construction equipment emissions, on-road vehicle emissions, and fugitive dust emissions were modeled with a series of volume sources. Volume sources are defined by their release height, initial vertical dimension and initial lateral dimension. For volume sources that represent roads the initial lateral dimension is calculated by dividing the center to center distance by 2.15 as recommended by BAAQMD (BAAQMD 2012). The center to center distance for roads is

determined by the width of the road. For Sir Francis Drake Boulevard, a distance of 20 meters was used. For College and Magnolia Avenues a distance of 12 meters was used and all other roads used 6 meters. The release height from the vehicles was assumed to be 10 feet and 3.2 meter initial vertical dimension as recommended by BAAQMD for trucks (BAAQMD 2012). Construction work areas were modeled as 10 by 10 meter adjacent volume sources and used release height of 5 meters and an initial vertical dimension of 1.4 meters (SCAQMD 2008). Details of source parameters are shown in **Table 7**. **Figures 3 through 5** show the locations of the sources from an overall aspect as well as closer views of the northern and southern sources.

The output of AERMOD is the 1-hour maximum air concentration and annual average air concentration in units of micrograms per cubic meter at each receptor in the model for each group of sources.

4 Exposure Factors and Toxicity Factors

4.1 Exposure Factors

Potential sensitive receptors were characterized as residents, day-care children, school children, medical patients, senior center users, and recreational users. The maximally exposed receptor for assuming residential exposure as well as the actual residential receptor, is reported. Given a specific receptor location, residential exposure assumptions are the most conservative compared to day-care children, school children, medical patients, senior center users, and recreational users.

The exposure parameters used to estimate excess lifetime cancer risks and chronic non-cancer Hazard Index (HI) for all potentially exposed populations were obtained using risk assessment guidelines from OEHHA (2015).

The inhalation dose is a function of the concentration of a chemical and the intake of that chemical. The dose can be calculated as follows:

$$Dose = \frac{Conc * DBR * ET * EF * ED * CF}{AT}$$

Where:

Dose = Dose of chemical (milligrams per kilogram-day [mg/kg-day])

Conc = Chemical concentration in air (micrograms per cubic meter [μg/m^3])

DBR = Daily Breathing Rate (liters per kilogram-day [l/kg-day])

ET = Exposure Time (hours/day)

EF = Exposure Frequency (days/year)

ED = Exposure Duration (years)

AT = Averaging Time (days)

CF = Conversion Factor (cubic meters per liter [m^3/l] and milligrams per microgram [mg/μg])

The DBR was set to the 95th percentile for third trimester, 0-2 years. The 80th percentile DBR was used for 2-15 years, and 16-30 years as recommended by CARB and CAPCOA (2015) and BAAQMD (2016). The exposure frequency was assumed to be for the 244 calendar days of the construction work schedule. The exposure frequency for residents was 350 days per year, consistent with a resident being present at the home except for two weeks out of the year and a

30-year exposure duration. There was no further adjustment for fraction of time at home. The averaging time was based on 70 years. The details of the exposure factors for the receptors are shown in **Table 8**.

4.2 Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. For purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories: cancer and non-cancer endpoints. Toxicity values, used to estimate the likelihood of adverse effects occurring in humans at different exposure levels, are identified as part of the toxicity assessment component of a risk assessment.

In this HRA, diesel exhaust and speciated gasoline total organic gases are the only chemical of potential concern that was quantified. Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole. For gasoline and gasoline exhaust, the individual chemicals making up the primary components were used to estimate health effects based on common speciation profiles (CARB 2020c).

The estimated excess lifetime cancer risk for a resident was adjusted using the age sensitivity factors (ASFs) recommended by OEHHA (2015). This approach accounts for an "anticipated special sensitivity to carcinogens" of infants and children. Cancer risk estimates are weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age and by a factor of 3 for exposures that occur from 2 years through 15 years of age. No weighting factor (i.e., an ASF of 1, which is equivalent to no adjustment) is applied to exposure from ages 16 to 70 years. These ASFs are shown in **Table 8**.

Excess lifetime cancer risks are estimated as the upper-bound incremental probability[1] that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs if the chemical is being inhaled) by the chemical-specific cancer potency factor (CPF).

[1] The upper-bound incremental probability means that the "true carcinogenic risk" of an individual is unlikely to exceed the model-derived cancer risk estimates and, therefore, is likely to be less than the predicted (modeled) risk (USEPA 2012). Thus, the modeled cancer risks would represent a conservative scenario.

The equation used to calculate the potential excess lifetime cancer risk for the inhalation pathway is as follows:

$$Risk_i = Dose * CPF_i * ASF$$

Where:

$Risk_i$ = Cancer Risk, the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unitless)

Dose = Dose of chemical (mg/kg-day)

CPF_i = Cancer Potency Factor for Chemical I (mg chemical/kg body weight-day)$^{-1}$

ASF = Age Sensitivity Factor (unitless)

The CPFs for potential carcinogens that are anticipated to be present at the project site are shown in **Table 9**.

The potential for exposure to result in chronic non-cancer effects is evaluated by comparing the estimated annual average air concentration (which is equivalent to the average daily air concentration) to the chemical-specific non-cancer chronic reference exposure level (RELs). When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient (HQ). To evaluate the potential for adverse chronic non-cancer health effects from simultaneous exposure to multiple chemicals, the HQs for all chemicals are summed, yielding an HI.

The equations used to calculate the chemical-specific HQs and the overall HI are:

$$Chronic\ HQ_i = C_i / REL_i$$

$$Chronic\ HI = \sum HQ_i$$

Where:

Chronic HQ_i = Chronic Hazard Quotient for $Chemical_i$ (unitless)

Chronic HI = Hazard Index (unitless)

C_i = Annual average air concentration for $Chemical_i$ ($\mu g/m^3$)

REL_i = Chronic Non-cancer Reference Exposure Level for $Chemical_i$ ($\mu g/m^3$)

In summing values for a HI, the organ end point (e.g. respiratory system, nervous system) is considered and only those chemicals that have the same target organ end point are summed together.

Acute non-cancer impacts were estimated in a similar manner to chronic non-cancer impacts, by estimating the HQs for all chemicals and summing them to yield an HI. **Table 9** contains the chronic and acute RELs used in this HRA.

5 Results

5.1 Project Construction and Operation HRA Results

The results of the project construction and operation HRA are shown in **Table 10** for the maximum exposed individual receptor (MEIR). The construction cancer risk is 3.17 in a million after mitigation. The mitigated Construction Chronic HI is .0028 and acute HI is 0.61. This is the anticipated cancer risk, chronic HI and acute HI from project activities. **Figure 6** shows the overall distribution of the mitigated cancer risk from construction activities and location of the MEIR assuming all receptors have residential exposures. The operational cancer risk from the emergency generator is 0.76 in a million. The operational chronic HI is 0.0002 and the acute HI is 0.066. **Figure 7** shows the location of the MEIR for mitigated chronic and acute health effects from construction. **Figure 8** shows the cancer risk and location of the MEIR for the project operation. **Figure 8** shows the location of the MEIR for chronic and acute health effects from project operation. **Figure 9** shows the mitigated PM2.5 concentration from project construction with a maximum of 0.033 $\mu g/m^3$. The operational PM 2.5 concentration is 0.0010 $\mu g/m^3$. The results of this HRA are below thresholds of significance used by BAAQMD (BAAQMD 2017).

5.2 BAAQMD Nearby Sources

BAAQMD suggests looking at sources within 1,000 feet of the project site to develop an estimate of the cumulative risk in the project vicinity. BAAQMD has an online tool to search for permitted sources. There are five permitted sources within 1000 feet of the project site. The major arterial roads (i.e. Sir Francis Drake Boulevard) in the project vicinity could contribute additional risk, however this would be small since the roads are not major interstates or highways and do not have a substantial amount of trucks on in this area and adequate information on annual average traffic counts and percentage of trucks is not readily available. Thus, the contribution to the overall risk does not include nearby major arterial roads. These are shown in **Table 11** as well as the distance to the MEIR. **Figure 10** shows the locations of the identified permitted sources. BAAQMD has a Health Risk Calculator Tool that will estimate the risk at the MEIR from the permitted sources. This tool uses basic distance adjustment multipliers. The distance to the MEIR exceeded the maximum distance in the adjustment multiplier tables, therefore the greatest distance in the tool was conservatively used. Values for one generator were not available so they were assumed to be similar to the other BAAQMD permitted generator. **Table 12** shows the estimated cumulative risk plus the project based on the use of the distance multipliers. The cumulative cancer risk when combining construction emissions is 17.43 in a million and when combining operation emissions is 13.77. Chronic and acute HIs are well below 1.

The results of the cumulative risk are below thresholds of significance used by BAAQMD (BAAQMD 2017).

6 References

BAAQMD. *See* Bay Area Air Quality Management District.

Bay Area Air Quality Management District. 2012. Recommended Methods for Screening and Modeling Local Risks and Hazards. May.

Bay Area Air Quality Management District. 2017. California Environmental Quality Act Air Quality Guidelines. Available: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed October 16, 2020.

Bay Area Air Quality Management District. 2016. BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines. December. Available online at: https://www.baaqmd.gov/~/media/files/planning-and-research/permit-modeling/hra_guidelines_12_7_2016_clean-pdf.pdf. Accessed October 16, 2020.

Bay Area Air Quality Management District. 2020. Permitted Sources Risk and Hazards Map. Available online at: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65. Accessed October 16, 2020.

California Air Resources Board. 2005. Air Quality and Land Use Handbook: A Community Health Perspective. April.

California Air Resources Board and California Air Pollution Control Officers Association. 2015. Risk Management Guidance for Stationary Sources of Air Toxics. Available online at: http://www.capcoa.org/wp-content/uploads/2016/04/Risk%20Management%20Guidance%20for%20Stationary%20Sources%20of%20Air%20Toxics%207.23.2015.pdf

California Air Resources Board. 2020a. HARP AERMOD Meteorological Files. Available online at: https://ww2.arb.ca.gov/resources/documents/harp-aermod-meteorological-files.

California Air Resources Board. 2020b. HARP Digital Elevation Model Files. Available online at: https://ww2.arb.ca.gov/resources/documents/harp-digital-elevation-model-files.

California Air Resources Board. 2020c. Speciation Profiles Used in ARB Modeling. Available online at: www.arb.ca.gov/ei/speciate/speciate.htm. Accessed on October 16, 2020.

CAPCOA. *See* California Air Pollution Control Officers Association.

CARB. *See* California Air Resources Board.

OEHHA. *See* Office of Environmental Health Hazard Assessment.

Office of Environmental Health Hazard Assessment. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments. February.

SCAQMD. *See* South Coast Air Quality Management District.

South Coast Air Quality Management District. 2008. Final Localized Significance Threshold Methodology. Available online at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2 Accessed October 16, 2020.

U.S. Environmental Protection Agency. 2012. Risk Assessment Guidelines for Superfund (RAGS) Part A. Chapter 8, Risk Assessment. Available online at: www.epa.gov/sites/production/files/2015-09/documents/rags_a.pdf. Accessed on September 18, 2017.

U.S. Environmental Protection Agency. 2019. AERMOD Implementation Guide. August. Accessed: October 16, 2020. Available online at: https://www3.epa.gov/ttn/scram/models/aermod/aermod_implementation_guide.pdf.

USEPA. *See* U.S. Environmental Protection Agency.

memo

Horizon Water & Environment, LLC

To: Caitlin Gilleran, Panorama Environmental, Inc.

From: Jennifer Schulte, Horizon Water & Environment

Date: October 26, 2020

Re: Health Risk Assessment for Alternative with No Construction Phase 7 at Frederick Allen Park

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This memorandum details the health impacts for an alternative for the Corte Madera Creek Flood Risk Management Project Phase 1. The alternative being evaluated is to consider not doing any of the Phase 7 Construction activities in the Frederick Allen Park. A health risk assessment (HRA) was conducted for the Proposed Project for Corte Madera Creek Flood Risk Management Project Phase 1 construction and operation. The detailed HRA report outlined the key assumptions and results of the HRA conducted following the Office of Environmental Health Hazard Assessment (OEHHA), California Air Resources Board (CARB) and Bay Area Air Quality Management District (BAAQMD) HRA guidelines. The analysis of this alternative followed the same assumptions and methodologies outlined for the project except for the removal of construction Phase 7.

The major toxic air contaminants (TACs) are from combustion of diesel and gasoline in the construction equipment and vehicles. Diesel exhaust is a complex mixture that includes hundreds of individual constituents and is identified by the State of California as a known carcinogen and it also has chronic health effects. Diesel particulate matter (DPM) could be emitted from the construction equipment, material hauling vehicles, worker vehicles and the emergency diesel generators during periodic testing. Various gasoline fuel-related toxic air contaminants (TACs) would be emitted from gasoline fueled vehicles. Specifically, TACs such as benzene, toluene, ethylbenzene, 1,3-butadiene, and xylenes may be emitted from the gasoline vehicles.

Briefly, emissions were estimated for construction equipment and construction vehicles on nearby roadways. Construction emissions were estimated using off-road construction emission factors used in California Emissions Estimator Model (CalEEMod) version 2016.3.2. The emission factors were combined with the horsepower, load factor and hours of use during the construction phase to give the emissions for a specific construction work area. The mitigated scenario assumed that all construction equipment was equivalent to Tier 3 engines with Level 3 Diesel Particulate Filters. Vehicle emissions were estimated using on-road emission factors from EMFAC2017. The vehicle emission factor was multiplied by the length of the specific road segment it would drive along for distance-based emission factors and number of trips for trip-based emission factors. See the project HRA report for additional details. Specifically Table 1a and Table 1b which would have the change to remove the rows associated with Phase 7. Table 2 and 3 would modify the road section weighting to remove Phase 7 and recalculated in the same manner.

The dispersion of emissions in ambient air was simulated using the U.S. Environmental Protection Agency's (USEPA's) approved model, AERMOD version 19121, which is an air dispersion model that is approved by the BAAQMD for air dispersion assessments. AERMOD was used to estimate levels of TACs at sensitive receptor locations from the project's construction and operation as well as PM2.5 concentrations. Meteorological data was from Gnoss Field Airport for surface station and Oakland International Airport for upper air station. Terrain was accounted for using a 30-meter resolution DEM for San Rafael. Urban sources was selected with a population for San Rafael Metropolitan Statistical Area of 258,826 and a surface roughness of 1 meter. Receptors were modeled in a 25-meter grid out to 500 meters. Construction

equipment was modeled as adjacent volume sources in the work area. Construction vehicles on roads was modeled as a series of volume sources. See the project HRA report for additional details. There would be no changes to these tables except for excluding the sources related to Phase 7.

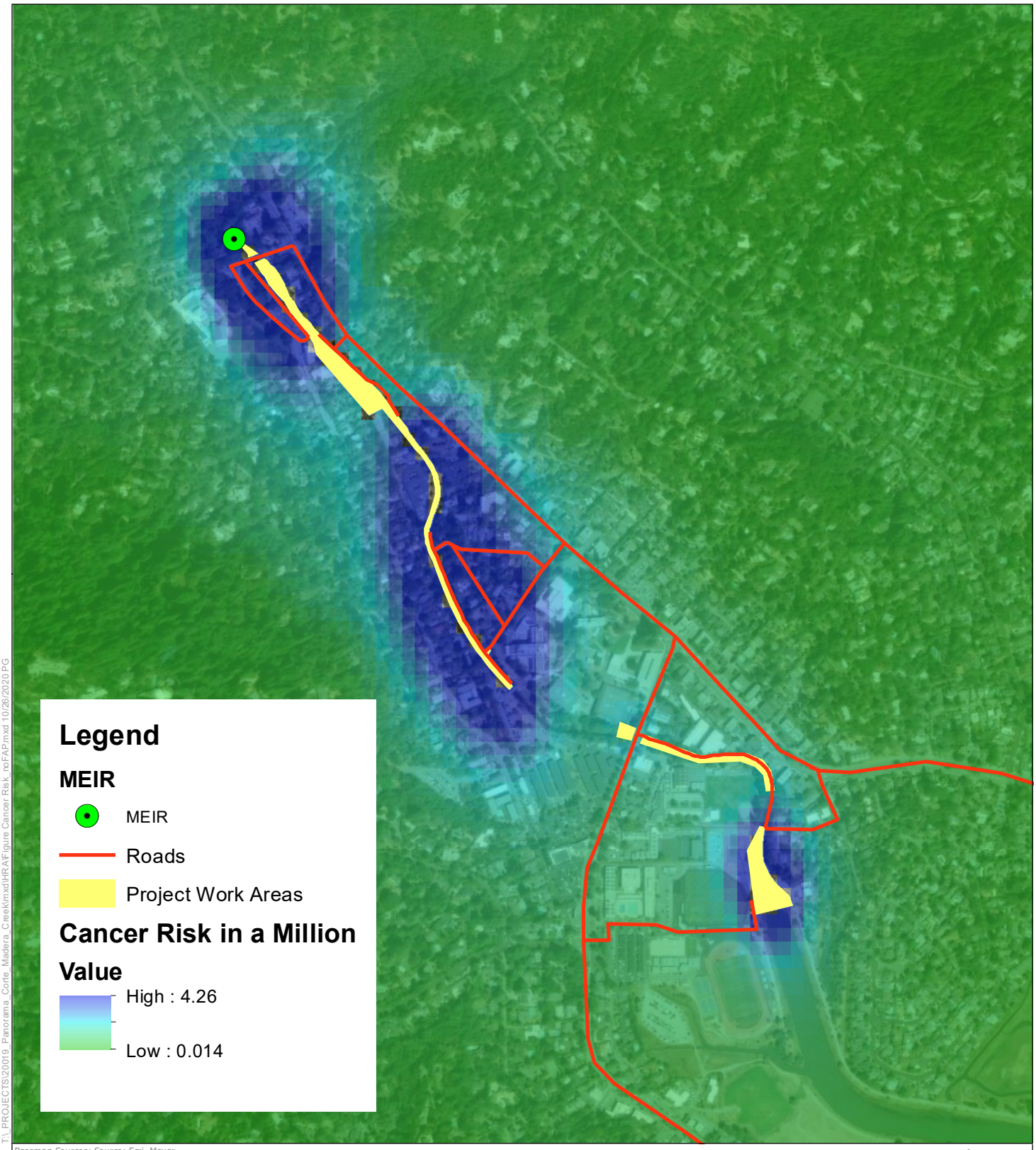
Residential exposure assumptions and toxicity factors were combined to determine the worst-case health impacts for cancer and chronic hazard index and the maximum receptor in the model domain is reported as well as the highest actual residential receptor. Acute hazard index is reported for any modeled receptor in the model domain since a person could be in this location for a short period of time. The PM2.5 concentration is reported for any modeled receptor in the model domain since the value is the highest ambient concentration and not a specific individual receptor.

The results for this alternative are shown in Table 1 and the excess cancer risk in a million people is shown in Figure 1. As shown in Table 1, the unmitigated scenario results in a cancer risk of 15.85 in a million which is above the BAAQMD CEQA significance threshold of 10 in a million. The mitigated scenario results in a cancer risk of 4.26 in a million which is below the BAAQMD CEQA significance threshold of 10 in a million. The chronic and acute hazard indices are well below the BAAQMD CEQA significance threshold of 1. The mitigated PM2.5 concentration is 0.031 $\mu g/m^3$ and is below the BAAQMD CEQA significance threshold of 0.3 $\mu g/m^3$. Operational results and impacts are the same as the project for this alternative.

Table 1: Health Risk Assessment Results at MEIR for No Phase 7 Construction at Frederick Allen Park

UTM X (m)	UTM Y (m)	Notes	Cancer Risk in a Million		Chronic HI		Acute HI		Mitigated PM 2.5 Concentration (ug/m^3)	
			Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Construction										
538933.7	4201716	Note 1	15.85	4.26	0.037	0.010			0.11	0.031
539733.7	4201016	Note 1					0.17	0.17		
Operation										
539483.7	4201016	Note 2	0.76	0.76	0.00020	0.00020	0.066	0.066	0.0010	0.0010

1. This represents the maximum of a receptor modeled using residential exposure assumptions.
2. This is the maximum of a receptor modeled using residential exposure assumptions since a person could be around for all Emergency Generator testing.



T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRA\Figure Cancer Risk_noFAP.mxd 10/26/2020 PG

Basemap Sources: Source: Esri, Maxar, GeoEye, Earthstar Geographics,

N

0 125 250 500 750 1,000
Meters

Figure 1
Construction Residential Cancer Risk
Alternative with No Phase 7 Construction at Frederick Allen Park
Health Risk Assessment

Horizon WATER and ENVIRONMENT

Table 1a: Construction Equipment Emission Rates

Construction Phase	SubPhase	SRCID	Equipment	Count	Horse Power	Usage (hr/day)	Load Factor	Duration (days)	DPM Emission Factor (g/bhp-hr)	Mitigated DPM Emission Factor (g/bhp-hr)	DPM Emissions (g)	Mitigated DPM Emissions (g)	DPF Reduction	DPM Emission Rate (g/s)	DPM Mitigated Emission Rate (g/s)	TOG Emission Factor (g/bhp-hr)	Mitigated TOG Emission Factor (g/bhp-hr)	1-hr TOG Emission Rate (g/s)
1	Demolition	LCCR	Excavator	1	120	6	0.38	15	0.138	0.112	566.352	6.89E+01	8.50E-01	2.68648E-05	3.27E-06	0.299503	0.12	0.0037937
1	Demolition	LCCR	Pump	1	44	24	0.74	15	0.152	0.28	1781.6832	4.92E+02	8.50E-01	8.45137E-05	2.34E-05	6.194	0.29	0.05602129
1	Demolition	LCCR	Crane	1	175	2.7	0.29	15	0.246	0.088	505.62225	2.71E+01	8.50E-01	2.39841E-05	1.29E-06	0.513527	0.12	0.0072393
1	Demolition	LCCR	Silent Piler	1	355	5.3	0.5	15	0.035	0.088	493.89375	1.86E+02	8.50E-01	2.34277E-05	8.84E-06	0.12801	0.12	0.0063116
1	Grading	LCCR	Excavator	1	120	5	0.38	30	0.138	0.112	943.92	1.15E+02	8.50E-01	4.47746E-05	5.45E-06	0.299503	0.12	0.0037937
1	Grading	LCCR	Pump	1	44	20	0.74	30	0.152	0.28	2969.472	8.21E+02	8.50E-01	0.000140856	3.89E-05	6.194	0.29	0.05602129
1	Grading	LCCR	Grader	1	140	2	0.41	30	0.229	0.112	788.676	5.79E+01	8.50E-01	3.74106E-05	2.74E-06	0.524016	0.12	0.00835514
2	Grading	FW1	Skid Steer Loader	1	67	4	0.37	5	0.081	0.192	40.1598	1.43E+01	8.50E-01	1.90497E-06	6.77E-07	0.195311	0.12	0.00134493
2	Grading	FW1	Excavator	1	24	4	0.38	5	0.16	0.28	29.184	7.98E+00	8.50E-01	1.38434E-06	3.79E-07	0.568779	0.29	0.00150094
2	Building Construction	FW1	Skid Steer Loader	1	67	2.4	0.37	50	0.081	0.192	240.9588	8.57E+01	8.50E-01	1.14298E-05	4.06E-06	0.195311	0.12	0.00134493
2	Building Construction	FW1	Excavator	1	24	2.4	0.38	50	0.16	0.28	175.104	4.79E+01	8.50E-01	8.30601E-06	2.27E-06	0.568779	0.29	0.00150094
2	Demolition	FW1	Skid Steer Loader	1	67	4	0.37	5	0.081	0.192	40.1598	1.43E+01	8.50E-01	1.90497E-06	6.77E-07	0.195311	0.12	0.00134493
2	Demolition	FW1	Excavator	1	24	4	0.38	5	0.16	0.28	29.184	7.98E+00	8.50E-01	1.38434E-06	3.79E-07	0.568779	0.29	0.00150094
2	Paving	FW1	Pump	1	550	2.5	0.74	10	0.034	0.088	345.95	1.34E+02	8.50E-01	1.641E-05	6.37E-06	30.396	0.12	3.43643667
3	Demolition	FW2	Skid Steer Loader	1	67	4	0.37	5	0.081	0.192	40.1598	1.43E+01	8.50E-01	1.90497E-06	6.77E-07	0.195311	0.12	0.00134493
3	Demolition	FW2	Excavator	1	24	4	0.38	5	0.16	0.28	29.184	7.98E+00	8.50E-01	1.38434E-06	3.79E-07	0.568779	0.29	0.00150094
3	Grading	FW2	Skid Steer Loader	1	67	4	0.37	5	0.081	0.192	40.1598	1.43E+01	8.50E-01	1.90497E-06	6.77E-07	0.195311	0.12	0.00134493
3	Grading	FW2	Excavator	1	24	4	0.38	5	0.16	0.28	29.184	7.98E+00	8.50E-01	1.38434E-06	3.79E-07	0.568779	0.29	0.00150094
3	Building Construction	FW2	Skid Steer Loader	1	67	2.67	0.37	15	0.081	0.192	80.4199995	2.86E+01	8.50E-01	3.8147E-06	1.36E-06	0.195311	0.12	0.00134493
3	Building Construction	FW2	Excavator	1	24	2.67	0.38	15	0.16	0.28	58.44096	1.60E+01	8.50E-01	2.77213E-06	7.58E-07	0.568779	0.29	0.00150094
3	Paving	FW2	Pump	1	550	2.5	0.74	10	0.034	0.088	345.95	1.34E+02	8.50E-01	1.641E-05	6.37E-06	30.396	0.12	3.43643667
4	Grading	COMFW	Skid Steer Loader	1	67	4	0.37	10	0.081	0.192	80.3196	2.86E+01	8.50E-01	3.80994E-06	1.35E-06	0.195311	0.12	0.00134493
4	Grading	COMFW	Excavator	1	24	4	0.38	10	0.16	0.28	58.368	1.60E+01	8.50E-01	2.76867E-06	7.57E-07	0.568779	0.29	0.00150094
4	Building Construction	COMFW	Skid Steer Loader	1	67	2.4	0.37	50	0.081	0.192	240.9588	8.57E+01	8.50E-01	1.14298E-05	4.06E-06	0.195311	0.12	0.00134493
4	Building Construction	COMFW	Excavator	1	24	2.4	0.38	50	0.16	0.28	175.104	4.79E+01	8.50E-01	8.30601E-06	2.27E-06	0.568779	0.29	0.00150094
4	Demolition	COMFW	Skid Steer Loader	1	67	4	0.37	5	0.081	0.192	40.1598	1.43E+01	8.50E-01	1.90497E-06	6.77E-07	0.195311	0.12	0.00134493
4	Demolition	COMFW	Excavator	1	24	4	0.38	5	0.16	0.28	29.184	7.98E+00	8.50E-01	1.38434E-06	3.79E-07	0.568779	0.29	0.00150094
4	Paving	COMFW	Pump	1	550	5	0.74	10	0.034	0.088	691.9	2.69E+02	8.50E-01	3.28201E-05	1.27E-05	30.396	0.12	3.43643667
5	Grading	NFP	Skid Steer Loader	1	67	3.2	0.37	25	0.081	0.192	160.6392	5.71E+01	8.50E-01	7.61988E-06	2.71E-06	0.195311	0.12	0.00134493
5	Grading	NFP	Excavator	1	120	4.8	0.38	25	0.138	0.112	755.136	9.19E+01	8.50E-01	3.58197E-05	4.36E-06	0.299503	0.12	0.0037937
5	Grading	NFP	Pump	2	44	24	0.74	25	0.152	0.28	5938.944	1.64E+03	8.50E-01	0.000281712	7.78E-05	6.194	0.29	0.11204258
5	Demolition	NFP	Skid Steer Loader	1	67	4	0.37	25	0.081	0.192	200.799	7.14E+01	8.50E-01	9.52485E-06	3.39E-06	0.195311	0.12	0.00134493
5	Demolition	NFP	Excavator	1	120	6	0.38	25	0.138	0.112	943.92	1.15E+02	8.50E-01	4.47746E-05	5.45E-06	0.299503	0.12	0.0037937
5	Demolition	NFP	Pump	2	44	24	0.74	25	0.152	0.28	5938.944	1.64E+03	8.50E-01	0.000281712	7.78E-05	6.194	0.29	0.11204258
5	Paving	NFP	Pump	2	44	12.92	0.74	25	0.152	0.28	3197.13152	8.83E+02	8.50E-01	0.000151655	4.19E-05	6.194	0.29	0.11204258
5	Paving	NFP	Pump	1	550	1.54	0.74	25	0.034	0.088	532.763	2.07E+02	8.50E-01	2.52715E-05	9.81E-06	30.396	0.12	3.43643667
6	Grading	SDPS	Excavator	1	120	6	0.38	10	0.138	0.112	377.568	4.60E+01	8.50E-01	1.79098E-05	2.18E-06	0.299503	0.12	0.0037937
6	Grading	SDPS	Pump	1	44	24	0.74	10	0.152	0.28	1187.7888	3.28E+02	8.50E-01	5.63424E-05	1.56E-05	6.194	0.29	0.05602129
6	Building Construction	SDPS	Excavator	1	120	2	0.38	15	0.138	0.112	188.784	2.30E+01	8.50E-01	8.95492E-06	1.09E-06	0.299503	0.12	0.0037937
6	Building Construction	SDPS	Pump	1	44	16	0.74	15	0.152	0.28	1187.7888	3.28E+02	8.50E-01	5.63424E-05	1.56E-05	6.194	0.29	0.05602129
6	Paving	SDPS	Crane	1	326	3	0.29	10	0.117	0.088	331.8354	3.74E+01	8.50E-01	1.57405E-05	1.78E-06	0.31051	0.12	0.00815434
6	Paving	SDPS	Pump	1	550	2.5	0.74	10	0.034	0.088	345.95	1.34E+02	8.50E-01	1.641E-05	6.37E-06	30.396	0.12	3.43643667
6	Demolition	SDPS	Excavator	1	120	6	0.38	5	0.138	0.112	188.784	2.30E+01	8.50E-01	8.95492E-06	1.09E-06	0.299503	0.12	0.0037937
6	Demolition	SDPS	Pump	1	44	24	0.74	5	0.152	0.28	593.8944	1.64E+02	8.50E-01	2.81712E-05	7.78E-06	6.194	0.29	0.05602129
7	Demolition	APRC	Skid Steer Loader	1	67	2.67	0.37	25	0.081	0.192	134.033333	4.77E+01	8.50E-01	6.35783E-06	2.26E-06	0.195311	0.12	0.00134493
7	Demolition	APRC	Excavator	1	120	3.2	0.38	25	0.138	0.112	503.424	6.13E+01	8.50E-01	2.38798E-05	2.91E-06	0.299503	0.12	0.0037937
7	Demolition	APRC	Pump	1	44	24	0.74	25	0.152	0.28	2969.472	8.21E+02	8.50E-01	0.000140856	3.89E-05	6.194	0.29	0.05602129
7	Demolition	APRC	Grader	1	140	3.6	0.41	25	0.229	0.112	1183.014	8.68E+01	8.50E-01	5.61159E-05	4.12E-06	0.524016	0.12	0.00835514
7	Grading	APRC	Skid Steer Loader	1	67	1.33	0.37	50	0.081	0.192	133.531335	4.75E+01	8.50E-01	6.33402E-06	2.25E-06	0.195311	0.12	0.00134493
7	Grading	APRC	Excavator	1	120	1.6	0.38	50	0.138	0.112	503.424	6.13E+01	8.50E-01	2.38798E-05	2.91E-06	0.299503	0.12	0.0037937
7	Grading	APRC	Pump	1	44	24	0.74	50	0.152	0.28	5938.944	1.64E+03	8.50E-01	0.000281712	7.78E-05	6.194	0.29	0.05602129
7	Grading	APRC	Grader	1	140	1.8	0.41	50	0.229	0.112	1183.014	8.68E+01	8.50E-01	5.61159E-05	4.12E-06	0.524016	0.12	0.00835514
7	Building Construction	APRC	Skid Steer Loader	1	67	1.48	0.37	45	0.081	0.192	133.732134	4.75E+01	8.50E-01	6.34355E-06	2.26E-06	0.195311	0.12	0.00134493
7	Building Construction	APRC	Excavator	1	120	1.78	0.38	45	0.138	0.112	504.05328	6.14E+01	8.50E-01	2.39096E-05	2.91E-06	0.299503	0.12	0.0037937
7	Building Construction	APRC	Pump	1	44	2.67	0.74	45	0.152	0.28	594.636768	1.64E+02	8.50E-01	2.82064E-05	7.79E-06	6.194	0.29	0.05602129
7	Paving	APRC	Rollers	1	36.2	4	0.38	20	0.25	0.28	275.12	4.62E+01	8.50E-01	1.30502E-05	2.19E-06	0.878567	0.29	0.0033571
7	Paving	APRC	Pump	1	550	1	0.74	20	0.034	0.088	276.76	1.07E+02	8.50E-01	1.3128E-05	5.10E-06	30.396	0.12	3.43643667

Table 1a: Construction Equipment Emission Rates

Construction Phase	SubPhase	SRCID	Equipment	Count	Horse Power	Usage (hr/day)	Load Factor	Duration (days)	DPM Emission Factor (g/bhp-hr)	Mitigated DPM Emission Factor (g/bhp-hr)	DPM Emissions (g)	Mitigated DPM Emissions (g)	DPF Reduction	DPM Emission Rate (g/s)	DPM Mitigated Emission Rate (g/s)	TOG Emission Factor (g/bhp-hr)	Mitigated TOG Emission Factor (g/bhp-hr)	1-hr TOG Emission Rate (g/s)
8	Demolition	FPTG	Excavator	1	120	8	0.38	5	0.138	0.112	251.712	3.06E+01	8.50E-01	1.19399E-05	1.45E-06	0.299503	0.12	0.0037937
8	Demolition	FPTG	Pump	1	44	24	0.74	5	0.152	0.28	593.8944	1.64E+02	8.50E-01	2.81712E-05	7.78E-06	6.194	0.29	0.05602129
8	Grading	FPTG	Excavator	1	120	1.43	0.38	35	0.138	0.112	314.95464	3.83E+01	8.50E-01	1.49398E-05	1.82E-06	0.299503	0.12	0.0037937
8	Grading	FPTG	Pump	1	44	24	0.74	35	0.152	0.28	4157.2608	1.15E+03	8.50E-01	0.000197199	5.45E-05	6.194	0.29	0.05602129
8	Building Construction	FPTG	Excavator	1	120	5	0.38	10	0.138	0.088	314.64	3.01E+01	8.50E-01	1.49249E-05	1.43E-06	0.299503	0.12	0.0037937
8	Building Construction	FPTG	Pump	1	44	24	0.74	10	0.152	0.28	1187.7888	3.28E+02	8.50E-01	5.63424E-05	1.56E-05	6.194	0.29	0.05602129
8	Paving	FPTG	Pump	1	550	5	0.74	10	0.034	0.088	691.9	2.69E+02	8.50E-01	3.28201E-05	1.27E-05	30.396	0.12	3.43643667
8	Paving	FPTG	Pump	1	44	12	0.74	10	0.152	0.28	593.8944	1.64E+02	8.50E-01	2.81712E-05	7.78E-06	6.194	0.29	0.05602129

Table 1b: Construction Fugitive Emission Rates

SRCID	Phase	Demolition Tons	Grader Hours	Truck Loading Tons	Emissions (g)			Mitigated Emissions (g)			Emission Rate (g/s)	Mitigated Emission Rate (g/s)
					Demolition	Grading	Truck Loading	Demolition	Grading	Truck Loading		
LCCR	1	245	60	9443.321514	4.15E-02	4.29E-01	1.30E-01	4.15E-02	2.10E-01	1.30E-01	8.65E-06	5.49782028958943E-06
FW1	2	119		440.4916892	2.01E-02	0.00E+00	6.08E-03	2.01E-02	0.00E+00	6.08E-03	3.77E-07	3.76530196268593E-07
FW2	3	3		31.04230336	5.09E-04	0.00E+00	4.29E-04	5.09E-04	0.00E+00	4.29E-04	1.35E-08	1.34817187919398E-08
COMFW	4	137		515.217958	2.32E-02	0.00E+00	7.11E-03	2.32E-02	0.00E+00	7.11E-03	4.36E-07	4.35886413725569E-07
NFP	5	228		1137.74958	3.86E-02	0.00E+00	1.57E-02	3.86E-02	0.00E+00	1.57E-02	7.81E-07	7.80867286498570E-07
SDPS	6	8		2154.139205	1.36E-03	0.00E+00	2.97E-02	1.36E-03	0.00E+00	2.97E-02	4.47E-07	4.47222551420889E-07
APRC	7	985	180	11453.34577	1.67E-01	1.29E+00	1.58E-01	1.67E-01	6.31E-01	1.58E-01	2.32E-05	1.37560965493456E-05
FPTG	8	7		1820.399328	1.19E-03	0.00E+00	2.51E-02	1.19E-03	0.00E+00	2.51E-02	3.79E-07	3.78518634349006E-07

Notes
1. Demolition debris is assumed to be 0.5 tons pe cubic yard. Truck Loading is assumed to be 1.2641662 ton per cubic yard.
2. Mitigation for watering is assumed to result in a 61% reduction in grading fugitive emissions.

Source CalEEMod Users Guide, 2017.

Table 2: Road Sources Emission Rates

SRCID	Vehicle	Length (miles)	DPM Exhaust Emissions (g)	Fugitive Emissions (g)	Total PM Emissions (g)	TOG Exhaust Emissions (g)	TOG Evaporative Emissions (g)	Fugitive Emission Rate (g/s)	Exhaust Emission Rate (g/s)	TOG Exhaust Emission Rate (g/s)	TOG Evaporative Emission Rate (g/s)
2A1	LDT1	0.122247		0.055032913	0.002482774	0.4043488	1.600204545	5.06431E-07	2.2847E-08	3.72095E-06	1.47256E-05
AP1	LDT1	0.130838		0.058900393	0.002497816	2.004819884	1.600204545	3.07332E-07	1.3033E-08	1.04608E-05	8.34958E-06
AP2	LDT1	0.076499		0.034438169	0.002402672	2.003133997	1.600204545	1.79692E-07	1.2537E-08	1.0452E-05	8.34958E-06
AP3	LDT1	0.115002		0.051771373	0.002470089	2.004328566	1.600204545	2.70134E-07	1.2888E-08	1.04582E-05	8.34958E-06
AP4	LDT1	0.020959		0.009435281	0.002305426	2.001410849	1.600204545	9.39876E-08	2.2965E-08	1.99366E-05	1.59401E-05
AP6	LDT1	0.13467		0.060625475	0.002504526	2.004938773	1.600204545	6.03908E-07	2.4948E-08	1.99718E-05	1.59401E-05
COL1	LDT1	0.248784		0.11199709	0.002704332	2.008479201	1.600204545	1.43439E-07	3.4635E-09	2.57234E-06	2.04944E-06
GWA1	LDT1	0.157466		0.070887733	0.00254444	2.005646027	1.600204545	7.73384E-07	2.776E-08	2.18816E-05	1.74582E-05
GWA2	LDT1	0.122284		0.05504957	0.002482839	2.004554493	1.600204545	3.91689E-07	1.7666E-08	1.42628E-05	1.13858E-05
GWA3	LDT1	0.111671		0.05027183	0.002464256	2.004225221	1.600204545	3.57695E-07	1.7534E-08	1.42605E-05	1.13858E-05
GWA4	LDT1	0.202005		0.090938212	0.002622425	2.007027866	1.600204545	1.29409E-06	3.7318E-08	2.85608E-05	2.27716E-05
GWA5	LDT1	0.017227		0.007755217	0.002298891	2.001295062	1.600204545	5.518E-08	1.6357E-08	1.42396E-05	1.13858E-05
LC1	LDT1	0.147995		0.066624097	0.002527857	2.005352186	1.600204545	3.06549E-07	1.1631E-08	9.22696E-06	7.36281E-06
LC2	LDT1	0.232078		0.104476416	0.002675081	2.007960891	1.600204545	4.80714E-07	1.2308E-08	9.23897E-06	7.36281E-06
LC3	LDT1	0.255031		0.114809352	0.00271527	2.008673016	1.600204545	2.94081E-07	6.9551E-09	5.14517E-06	4.09888E-06
MAG1	LDT1	0.78839		0.354915855	0.003649145	2.02522067	1.600204545	4.54554E-07	4.6736E-09	2.59378E-06	2.04944E-06
SFD1	LDT1	0.660864		0.297506452	0.003425856	2.02126413	1.600204545	1.36041E-05	1.5665E-07	9.24265E-05	7.31727E-05
SFD2	LDT1	0.238853		0.107526372	0.002686943	2.008171088	1.600204545	4.55983E-06	1.1394E-07	8.51598E-05	6.78593E-05
SFD3	LDT1	0.168326		0.075776667	0.002563455	2.005982963	1.600204545	2.51611E-06	8.5118E-08	6.66073E-05	5.31337E-05
SFD4	LDT1	0.34912		0.157166153	0.002880013	2.011592161	1.600204545	2.38564E-06	4.3716E-08	3.05342E-05	2.42897E-05
SFD5	LDT1	0.121537		0.054713287	0.002481531	2.004531317	1.600204545	2.85484E-07	1.2948E-08	1.04593E-05	8.34958E-06
2A1	LHDT	0.122247	0.00272947	0.057902051	0.00272947	0.146148356		3.43321E-07	1.6184E-08	8.66563E-07	
AP1	LHDT	0.130838	0.00292129	0.061971161	0.002921285	0.147637796		1.411E-07	6.6514E-09	3.36152E-07	
AP2	LHDT	0.076499	0.00170803	0.036233601	0.001708031	0.138216925		8.24991E-08	3.889E-09	3.14702E-07	
AP3	LHDT	0.115002	0.00256771	0.054470471	0.002567707	0.144892274		1.24022E-07	5.8463E-09	3.299E-07	
AP4	LHDT	0.020959	0.00046796	0.009927189	0.000467962	0.128587834		2.82536E-08	1.3319E-09	3.65972E-07	
AP6	LHDT	0.13467	0.00300684	0.063786181	0.003006844	0.148302158		1.81541E-07	8.5577E-09	4.2208E-07	
COL1	LHDT	0.248784	0.00555472	0.117836052	0.005554724	0.168086352		5.58952E-08	2.6349E-09	7.97313E-08	
GWA1	LHDT	0.157466	0.00351582	0.074583461	0.003515822	0.152254351		6.54502E-07	3.0853E-08	1.3361E-06	
GWA2	LHDT	0.122284	0.0027303	0.057919576	0.002730296	0.146154771		3.98373E-07	1.8779E-08	1.00526E-06	
GWA3	LHDT	0.111671	0.00249333	0.05289275	0.002493334	0.144314772		3.63798E-07	1.7149E-08	9.92602E-07	
GWA4	LHDT	0.202005	0.00451027	0.095679271	0.004510266	0.159976174		1.31617E-06	6.2044E-08	2.20064E-06	
GWA5	LHDT	0.017227	0.00038464	0.008159535	0.000384636	0.127940809		5.61216E-08	2.6455E-09	8.79981E-07	
LC1	LHDT	0.147995	0.00330436	0.070097541	0.003304358	0.150612343		2.16129E-07	1.0188E-08	4.64377E-07	
LC2	LHDT	0.232078	0.00518172	0.109923288	0.005181721	0.165189996		3.38922E-07	1.5977E-08	5.09323E-07	
LC3	LHDT	0.255031	0.0056942	0.120794932	0.005694204	0.169169408		1.14597E-07	5.4021E-09	1.6049E-07	
MAG1	LHDT	0.78839	0.01760278	0.373419373	0.017602777	0.261639021		1.7713E-07	8.3498E-09	1.24108E-07	
SFD1	LHDT	0.660864	0.01475544	0.313016934	0.01475544	0.23952956		9.17599E-06	4.3255E-07	7.02173E-06	
SFD2	LHDT	0.238853	0.00533299	0.113132254	0.00533299	0.166364592		3.02128E-06	1.4242E-07	4.44289E-06	
SFD3	LHDT	0.168326	0.0037583	0.079727279	0.003758299	0.154137173		1.65645E-06	7.8084E-08	3.20242E-06	

Table 2: Road Sources Emission Rates

SRCID	Vehicle	Length (miles)	DPM Exhaust Emissions (g)	Fugitive Emissions (g)	Total PM Emissions (g)	TOG Exhaust Emissions (g)	TOG Evaporative Emissions (g)	Fugitive Emission Rate (g/s)	Exhaust Emission Rate (g/s)	TOG Exhaust Emission Rate (g/s)	TOG Evaporative Emission Rate (g/s)
SFD4	LHDT	0.34912	0.00779498	0.165360002	0.007794976	0.185481823		8.47131E-07	3.9933E-08	9.50214E-07	
SFD5	LHDT	0.121537	0.00271362	0.057565761	0.002713617	0.146025262		1.3107E-07	6.1785E-09	3.3248E-07	
2A1	MHDT	0.122247	0.00460247	0.060058489	0.004602474	0.129738054		7.89134E-07	6.0474E-08	1.70468E-06	
AP1	MHDT	0.130838	0.00492592	0.064279144	0.004925917	0.130609936		4.20771E-07	3.2245E-08	8.54972E-07	
AP2	MHDT	0.076499	0.00288011	0.037583044	0.002880109	0.125095185		2.46018E-07	1.8853E-08	8.18872E-07	
AP3	MHDT	0.115002	0.00432971	0.056499107	0.004329707	0.129002774		3.69843E-07	2.8342E-08	8.44451E-07	
AP4	MHDT	0.020959	0.00078908	0.010296906	0.000789085	0.119458546		2.55938E-07	1.9613E-08	2.96924E-06	
AP6	MHDT	0.13467	0.00507019	0.06616176	0.005070187	0.130998838		1.6445E-06	1.2602E-07	3.25608E-06	
COL1	MHDT	0.248784	0.00936646	0.122224603	0.009366463	0.14258003		5.10197E-07	3.9098E-08	5.95166E-07	
GWA1	MHDT	0.157466	0.00592843	0.077361162	0.005928433	0.133312357		6.60529E-07	5.0618E-08	1.13825E-06	
GWA2	MHDT	0.122284	0.00460387	0.060076667	0.004603867	0.129741809		3.36267E-07	2.5769E-08	7.26204E-07	
GWA3	MHDT	0.111671	0.0042043	0.054862627	0.004204299	0.128664718		3.07082E-07	2.3533E-08	7.20175E-07	
GWA4	MHDT	0.202005	0.00760528	0.09924264	0.007605281	0.137832527		1.11098E-06	8.5138E-08	1.54298E-06	
GWA5	MHDT	0.017227	0.00064858	0.008463419	0.000648579	0.119079793		4.73723E-08	3.6303E-09	6.66525E-07	
LC1	MHDT	0.147995	0.00557186	0.072708173	0.00557186	0.132351165		4.58703E-07	3.5152E-08	8.3498E-07	
LC2	MHDT	0.232078	0.0087375	0.114017145	0.008737499	0.140884573		7.19314E-07	5.5123E-08	8.88815E-07	
LC3	MHDT	0.255031	0.00960166	0.12529368	0.009601656	0.143214025		1.04602E-06	8.016E-08	1.19562E-06	
MAG1	MHDT	0.78839	0.02968208	0.387326577	0.029682075	0.197343519		1.6168E-06	1.239E-07	8.23762E-07	
SFD1	MHDT	0.660864	0.02488085	0.324674578	0.024880852	0.184401171		1.97439E-05	1.513E-06	1.12137E-05	
SFD2	MHDT	0.238853	0.00899257	0.117345622	0.008992571	0.141572154		6.88546E-06	5.2765E-07	8.307E-06	
SFD3	MHDT	0.168326	0.0063373	0.08269655	0.006337301	0.134414516		3.76578E-06	2.8858E-07	6.12088E-06	
SFD4	MHDT	0.34912	0.01314401	0.17151848	0.01314401	0.152762922		5.38599E-06	4.1275E-07	4.79703E-06	
SFD5	MHDT	0.121537	0.00457574	0.059709674	0.004575743	0.129665997		3.90859E-07	2.9953E-08	8.48793E-07	
2A1	HHDT	0.122247	0.0041068	0.057134184	0.004106799	5.22342705		1.6288E-06	1.1708E-07	0.000148911	
AP1	HHDT	0.130838	0.00439541	0.061149331	0.004395407	5.224236469		7.30952E-07	5.2541E-08	6.24482E-05	
AP2	HHDT	0.076499	0.00256993	0.035753089	0.002569928	5.219116809		4.27376E-07	3.072E-08	6.2387E-05	
AP3	HHDT	0.115002	0.00386341	0.053748111	0.003863408	5.222744448		6.42481E-07	4.6181E-08	6.24303E-05	
AP4	HHDT	0.020959	0.0007041	0.00979554	0.000704102	5.213883994		7.18347E-07	5.1635E-08	0.000382355	
AP6	HHDT	0.13467	0.00452414	0.062940281	0.004524141	5.224597509		4.61567E-06	3.3177E-07	0.000383141	
COL1	HHDT	0.248784	0.00835772	0.116273371	0.008357717	5.235348993		1.40091E-06	1.007E-07	6.30777E-05	
GWA1	HHDT	0.157466	0.00528996	0.073594373	0.005289956	5.22674528		1.63725E-06	1.1769E-07	0.000116279	
GWA2	HHDT	0.122284	0.00410804	0.057151476	0.004108042	5.223430536		5.66592E-07	4.0727E-08	5.17844E-05	
GWA3	HHDT	0.111671	0.00375151	0.052191313	0.003751506	5.222430611		5.17417E-07	3.7192E-08	5.17744E-05	
GWA4	HHDT	0.202005	0.00678621	0.094410421	0.006786211	5.230941614		1.87194E-06	1.3456E-07	0.000103718	
GWA5	HHDT	0.017227	0.00057873	0.008051327	0.000578729	5.213532376		7.98197E-08	5.7374E-09	5.16862E-05	
LC1	HHDT	0.147995	0.00497178	0.069167943	0.004971784	5.225852951		1.04663E-06	7.5231E-08	7.90759E-05	
LC2	HHDT	0.232078	0.00779649	0.108465542	0.007796492	5.233775003		1.64127E-06	1.1797E-07	7.91958E-05	
LC3	HHDT	0.255031	0.00856758	0.119193011	0.008567581	5.235937567		2.87218E-06	2.0645E-07	0.00012617	
MAG1	HHDT	0.78839	0.02648539	0.368467275	0.026485388	5.286189076		4.43945E-06	3.1911E-07	6.36902E-05	
SFD1	HHDT	0.660864	0.02220125	0.308865863	0.022201245	5.274173953		4.60333E-05	3.3089E-06	0.000786062	

Table 2: Road Sources Emission Rates

SRCID	Vehicle	Length (miles)	DPM Exhaust Emissions (g)	Fugitive Emissions (g)	Total PM Emissions (g)	TOG Exhaust Emissions (g)	TOG Evaporative Emissions (g)	Fugitive Emission Rate (g/s)	Exhaust Emission Rate (g/s)	TOG Exhaust Emission Rate (g/s)	TOG Evaporative Emission Rate (g/s)
SFD2	HHDT	0.238853	0.00802409	0.111631951	0.008024093	5.234413323		1.62934E-05	1.1712E-06	0.000763998	
SFD3	HHDT	0.168326	0.00565479	0.078669976	0.005654789	5.227768478		9.23966E-06	6.6415E-07	0.000613993	
SFD4	HHDT	0.34912	0.01172843	0.163167081	0.011728432	5.244802354		1.39161E-05	1.0003E-06	0.000447317	
SFD5	HHDT	0.121537	0.00408295	0.056802353	0.004082947	5.223360156		6.7899E-07	4.8806E-08	6.24377E-05	

Table 3: Distribution of Vehicle Trips to Road Segments

SRCID	Vehicle	Road Section Weighting by Phase								Trips by Phase								Emissions Weighting
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	
2A1	LDT1	0.5	0.5	1						108	140	70	150	150	80	210	110	194
AP1	LDT1								1	108	140	70	150	150	80	210	110	110
AP2	LDT1								1	108	140	70	150	150	80	210	110	110
AP3	LDT1								1	108	140	70	150	150	80	210	110	110
AP4	LDT1							1		108	140	70	150	150	80	210	110	210
AP6	LDT1							1		108	140	70	150	150	80	210	110	210
COL1	LDT1	0.25								108	140	70	150	150	80	210	110	27
GWA1	LDT1				0.5	0.5	1			108	140	70	150	150	80	210	110	230
GWA2	LDT1				0.5	0.5				108	140	70	150	150	80	210	110	150
GWA3	LDT1				0.5	0.5				108	140	70	150	150	80	210	110	150
GWA4	LDT1				1	1				108	140	70	150	150	80	210	110	300
GWA5	LDT1				0.5	0.5				108	140	70	150	150	80	210	110	150
LC1	LDT1	0.25	0.5							108	140	70	150	150	80	210	110	97
LC2	LDT1	0.25	0.5							108	140	70	150	150	80	210	110	97
LC3	LDT1	0.5								108	140	70	150	150	80	210	110	54
MAG1	LDT1	0.25								108	140	70	150	150	80	210	110	27
SFD1	LDT1	0.5	1	1	1	1	1	1	1	108	140	70	150	150	80	210	110	964
SFD2	LDT1	0.5	0.5	1	1	1	1	1	1	108	140	70	150	150	80	210	110	894
SFD3	LDT1				1	1	1	1	1	108	140	70	150	150	80	210	110	700
SFD4	LDT1							1	1	108	140	70	150	150	80	210	110	320
SFD5	LDT1								1	108	140	70	150	150	80	210	110	110
2A1	LHDT	0.5	0.5	1						40	110	50	120	170	40	60	48	125
AP1	LHDT								1	40	110	50	120	170	40	60	48	48
AP2	LHDT								1	40	110	50	120	170	40	60	48	48
AP3	LHDT								1	40	110	50	120	170	40	60	48	48
AP4	LHDT							1		40	110	50	120	170	40	60	48	60
AP6	LHDT							1		40	110	50	120	170	40	60	48	60
COL1	LHDT	0.25								40	110	50	120	170	40	60	48	10
GWA1	LHDT				0.5	0.5	1			40	110	50	120	170	40	60	48	185
GWA2	LHDT				0.5	0.5				40	110	50	120	170	40	60	48	145
GWA3	LHDT				0.5	0.5				40	110	50	120	170	40	60	48	145
GWA4	LHDT				1	1				40	110	50	120	170	40	60	48	290
GWA5	LHDT				0.5	0.5				40	110	50	120	170	40	60	48	145
LC1	LHDT	0.25	0.5							40	110	50	120	170	40	60	48	65
LC2	LHDT	0.25	0.5							40	110	50	120	170	40	60	48	65
LC3	LHDT	0.5								40	110	50	120	170	40	60	48	20
MAG1	LHDT	0.25								40	110	50	120	170	40	60	48	10
SFD1	LHDT	0.5	1	1	1	1	1	1	1	40	110	50	120	170	40	60	48	618
SFD2	LHDT	0.5	0.5	1	1	1	1	1	1	40	110	50	120	170	40	60	48	563
SFD3	LHDT				1	1	1	1	1	40	110	50	120	170	40	60	48	438
SFD4	LHDT							1	1	40	110	50	120	170	40	60	48	108
SFD5	LHDT								1	40	110	50	120	170	40	60	48	48
2A1	MHDT	0.5	0.5	1						352	90	56	92	144	62	524	138	277
AP1	MHDT								1	352	90	56	92	144	62	524	138	138
AP2	MHDT								1	352	90	56	92	144	62	524	138	138
AP3	MHDT								1	352	90	56	92	144	62	524	138	138
AP4	MHDT							1		352	90	56	92	144	62	524	138	524
AP6	MHDT							1		352	90	56	92	144	62	524	138	524
COL1	MHDT	0.25								352	90	56	92	144	62	524	138	88
GWA1	MHDT				0.5	0.5	1			352	90	56	92	144	62	524	138	180
GWA2	MHDT				0.5	0.5				352	90	56	92	144	62	524	138	118
GWA3	MHDT				0.5	0.5				352	90	56	92	144	62	524	138	118
GWA4	MHDT				1	1				352	90	56	92	144	62	524	138	236
GWA5	MHDT				0.5	0.5				352	90	56	92	144	62	524	138	118
LC1	MHDT	0.25	0.5							352	90	56	92	144	62	524	138	133
LC2	MHDT	0.25	0.5							352	90	56	92	144	62	524	138	133
LC3	MHDT	0.5								352	90	56	92	144	62	524	138	176
MAG1	MHDT	0.25								352	90	56	92	144	62	524	138	88
SFD1	MHDT	0.5	1	1	1	1	1	1	1	352	90	56	92	144	62	524	138	1282
SFD2	MHDT	0.5	0.5	1	1	1	1	1	1	352	90	56	92	144	62	524	138	1237
SFD3	MHDT				1	1	1	1	1	352	90	56	92	144	62	524	138	960
SFD4	MHDT							1	1	352	90	56	92	144	62	524	138	662
SFD5	MHDT								1	352	90	56	92	144	62	524	138	138
2A1	HHDT	0.5	0.5	1						1016	130	28	148	270	260	1546	252	601
AP1	HHDT								1	1016	130	28	148	270	260	1546	252	252
AP2	HHDT								1	1016	130	28	148	270	260	1546	252	252
AP3	HHDT								1	1016	130	28	148	270	260	1546	252	252
AP4	HHDT							1		1016	130	28	148	270	260	1546	252	1546

Table 3: Distribution of Vehicle Trips to Road Segments

SRCID	Vehicle	Road Section Weighting by Phase								Trips by Phase								Emissions Weighting
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	
AP6	HHDT							1		1016	130	28	148	270	260	1546	252	1546
COL1	HHDT	0.25								1016	130	28	148	270	260	1546	252	254
GWA1	HHDT				0.5	0.5	1			1016	130	28	148	270	260	1546	252	469
GWA2	HHDT				0.5	0.5				1016	130	28	148	270	260	1546	252	209
GWA3	HHDT				0.5	0.5				1016	130	28	148	270	260	1546	252	209
GWA4	HHDT				1	1				1016	130	28	148	270	260	1546	252	418
GWA5	HHDT				0.5	0.5				1016	130	28	148	270	260	1546	252	209
LC1	HHDT	0.25	0.5							1016	130	28	148	270	260	1546	252	319
LC2	HHDT	0.25	0.5							1016	130	28	148	270	260	1546	252	319
LC3	HHDT	0.5								1016	130	28	148	270	260	1546	252	508
MAG1	HHDT	0.25								1016	130	28	148	270	260	1546	252	254
SFD1	HHDT	0.5	1	1	1	1	1	1	1	1016	130	28	148	270	260	1546	252	3142
SFD2	HHDT	0.5	0.5	1	1	1	1	1	1	1016	130	28	148	270	260	1546	252	3077
SFD3	HHDT				1	1	1	1	1	1016	130	28	148	270	260	1546	252	2476
SFD4	HHDT							1	1	1016	130	28	148	270	260	1546	252	1798
SFD5	HHDT								1	1016	130	28	148	270	260	1546	252	252

Table 4: Operational Emission Rate and Source Parameters

SRCID	Emission Rate (g/s)	Stack Height (m)	Temperature (K)	Flow Rate (m/s)	Stack Diameter (m)
EG	3.48076E-05	3.04	765.8	54.28	0.12

Table 5: Speciation Factors

Type	CAP	TOG Type	Chemical	Ratio	Speciation Profile
Gasoline Vehicle	TOG	Exhaust	Acetaldehyde	0.0028	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Benzene	0.0247	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	1,3-Butadiene	0.0055	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Ethylbenzene	0.0105	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Formaldehyde	0.0158	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Hexane	0.016	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Methanol	0.0012	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Methyl Ethyl Ketone	0.0002	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	naphthalene	0.0005	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Propylene	0.0306	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Styrene	0.0012	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Toluene	0.0576	BAAQMD Table 14
Gasoline Vehicle	TOG	Exhaust	Xylenes	0.048	BAAQMD Table 14
Gasoline Vehicle	TOG	Evaporative	Benzene	0.0036	BAAQMD Table 15
Gasoline Vehicle	TOG	Evaporative	Ethylbenzene	0.0012	BAAQMD Table 15
Gasoline Vehicle	TOG	Evaporative	Hexane	0.0154	BAAQMD Table 15
Gasoline Vehicle	TOG	Evaporative	Toluene	0.017	BAAQMD Table 15
Gasoline Vehicle	TOG	Evaporative	Xylenes	0.0058	BAAQMD Table 15
OFFROAD	TOG	Exhaust	Acetaldehyde	0.0735	CARB 818
OFFROAD	TOG	Exhaust	Benzene	0.02	CARB 818
OFFROAD	TOG	Exhaust	1,3-Butadiene	0.0019	CARB 818
OFFROAD	TOG	Exhaust	Formaldehyde	0.1471	CARB 818
OFFROAD	TOG	Exhaust	Methanol	0.0003	CARB 818
OFFROAD	TOG	Exhaust	Methyl Ethyl Ketone	0.0148	CARB 818
OFFROAD	TOG	Exhaust	Styrene	0.0006	CARB 818
OFFROAD	TOG	Exhaust	Toluene	0.0147	CARB 818
OFFROAD	TOG	Exhaust	Xylenes	0.0105	CARB 818
Diesel (Acute)	TOG	Exhaust	Acetaldehyde	0.15942	EPA 4674
Diesel (Acute)	TOG	Exhaust	Benzene	0.01045	EPA 4674
Diesel (Acute)	TOG	Exhaust	Formaldehyde	0.08505	EPA 4674
Diesel (Acute)	TOG	Exhaust	Methyl Ethyl Ketone	0.0286	EPA 4674
Diesel (Acute)	TOG	Exhaust	Toluene	0.01518	EPA 4674
Diesel (Acute)	TOG	Exhaust	Xylenes	0.01206	EPA 4674

Sources:

California Air Resources Board. 2020c. Speciation Profiles Used in ARB Modeling.

Bay Area Air Quality Management District. 2012. Recommended Methods for Screening and Modeling Local Risks and Hazards. May.

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
538933.7	4201716	539058.7	4201541	539083.7	4201616	539108.7	4201616
539383.7	4200966	539308.7	4201166	538883.7	4201766	538883.7	4201791
538958.7	4201691	538908.7	4201791	539183.7	4201516	539258.7	4201391
538908.7	4201766	539008.7	4201691	539258.7	4201141	539408.7	4200891
539383.7	4201016	539033.7	4201641	539333.7	4200966	539208.7	4201366
538933.7	4201691	539108.7	4201466	539233.7	4201366	539408.7	4201091
538933.7	4201766	539333.7	4201116	539208.7	4201416	539083.7	4201641
539358.7	4200991	539308.7	4201191	539283.7	4201066	539058.7	4201491
538958.7	4201766	538958.7	4201641	539033.7	4201691	539333.7	4201216
539358.7	4201041	538983.7	4201766	539333.7	4201166	539283.7	4201041
539383.7	4201041	539083.7	4201591	539383.7	4201091	539433.7	4200941
538958.7	4201741	539283.7	4201241	539358.7	4201116	539183.7	4201541
538983.7	4201666	539033.7	4201566	538933.7	4201816	539358.7	4200916
538933.7	4201791	539133.7	4201441	539433.7	4201016	539233.7	4201316
539383.7	4200941	539008.7	4201716	539208.7	4201391	539158.7	4201391
538958.7	4201666	538908.7	4201691	538983.7	4201791	539233.7	4201416
538908.7	4201716	538983.7	4201616	539033.7	4201541	539383.7	4201116
539333.7	4201016	539283.7	4201091	539258.7	4201216	539433.7	4200916
539408.7	4200966	539008.7	4201591	539433.7	4200966	539233.7	4201441
539358.7	4200966	539083.7	4201491	538958.7	4201816	539233.7	4201216
539408.7	4201016	539358.7	4201091	539308.7	4201316	539233.7	4201241
538983.7	4201641	539358.7	4200941	539433.7	4200991	539333.7	4201241
538908.7	4201741	539308.7	4201216	539283.7	4201341	539033.7	4201516
539008.7	4201616	539058.7	4201616	539108.7	4201441	539283.7	4201391
539108.7	4201491	539183.7	4201441	539008.7	4201566	539233.7	4201291
539308.7	4201066	539258.7	4201191	539208.7	4201466	539258.7	4201416
539133.7	4201466	539408.7	4200916	539383.7	4200991	539433.7	4201066
539358.7	4201066	539183.7	4201491	538933.7	4201641	539233.7	4201191
538983.7	4201716	539183.7	4201416	538958.7	4201616	539233.7	4201266
539083.7	4201516	539308.7	4201241	538983.7	4201591	539333.7	4200941
539408.7	4200991	539258.7	4201166	539233.7	4201341	539033.7	4201741
539033.7	4201591	539133.7	4201566	538883.7	4201741	539258.7	4201091
538958.7	4201791	539383.7	4200916	539333.7	4201191	539358.7	4201166
539408.7	4201041	539333.7	4201141	539083.7	4201466	539383.7	4200891
539333.7	4201066	539308.7	4201266	539133.7	4201416	538883.7	4201716
538983.7	4201741	539158.7	4201541	539283.7	4201366	539308.7	4201366
539283.7	4201216	539033.7	4201666	539183.7	4201391	539908.7	4200616
539333.7	4200991	539258.7	4201316	539433.7	4201041	539933.7	4200566
539333.7	4201091	539108.7	4201591	539258.7	4201116	539333.7	4201266
539133.7	4201541	539408.7	4201066	539033.7	4201716	539058.7	4201691
539108.7	4201566	539158.7	4201416	539908.7	4200591	539008.7	4201541
539308.7	4201116	539308.7	4201016	539133.7	4201591	538983.7	4201816
539308.7	4201041	539258.7	4201341	539308.7	4201341	538908.7	4201816
539283.7	4201116	539308.7	4201291	539158.7	4201566	539183.7	4201366
539283.7	4201191	539058.7	4201516	539008.7	4201766	539208.7	4201516
539158.7	4201516	539058.7	4201641	538908.7	4201666	539208.7	4201341
539283.7	4201141	539258.7	4201241	539308.7	4200991	539433.7	4200891
539308.7	4201141	539258.7	4201291	539358.7	4201141	538983.7	4201566
538933.7	4201666	539258.7	4201266	539208.7	4201491	539108.7	4201416
539383.7	4201066	539008.7	4201741	539058.7	4201666	539233.7	4201466

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
539233.7	4201166	539458.7	4201041	539208.7	4201191	539233.7	4201066
538958.7	4201591	539408.7	4200866	539858.7	4200541	539208.7	4201591
539083.7	4201441	539858.7	4200566	538858.7	4201766	539208.7	4201141
539333.7	4201291	538983.7	4201541	539308.7	4201416	539383.7	4201241
539008.7	4201791	539208.7	4201266	538883.7	4201666	539183.7	4201241
539133.7	4201391	539333.7	4200916	539233.7	4201091	539908.7	4200666
539158.7	4201591	539933.7	4200491	539408.7	4201166	538933.7	4201566
539133.7	4201616	539458.7	4200966	538908.7	4201616	539858.7	4200641
539283.7	4201016	539908.7	4200641	539008.7	4201491	539033.7	4201441
539083.7	4201666	539008.7	4201816	539183.7	4201291	539408.7	4200841
538933.7	4201616	539408.7	4201141	539858.7	4200616	539308.7	4201441
539908.7	4200491	539233.7	4201116	539358.7	4201291	539358.7	4201341
539383.7	4201141	539108.7	4201391	539058.7	4201766	539058.7	4201791
539108.7	4201641	539108.7	4201666	539108.7	4201691	539958.7	4200541
539358.7	4201191	539283.7	4200991	539458.7	4200916	539108.7	4201716
539408.7	4201116	539058.7	4201741	538858.7	4201741	539933.7	4200641
539183.7	4201566	539208.7	4201241	539383.7	4201216	539258.7	4201516
539058.7	4201466	539358.7	4201241	539208.7	4201166	539158.7	4201291
539308.7	4200966	539158.7	4201616	539258.7	4201491	538983.7	4201866
539933.7	4200591	538958.7	4201566	538983.7	4201516	539458.7	4201116
539258.7	4201441	539083.7	4201416	539258.7	4201016	538858.7	4201716
538958.7	4201841	539133.7	4201641	538858.7	4201791	539308.7	4200916
539158.7	4201366	539133.7	4201366	539133.7	4201341	539433.7	4201166
539208.7	4201316	539258.7	4201466	539108.7	4201366	539008.7	4201466
539058.7	4201716	539258.7	4201041	539433.7	4201141	539183.7	4201216
539333.7	4201316	539183.7	4201591	539133.7	4201666	538883.7	4201641
539258.7	4201066	538983.7	4201841	539158.7	4201316	539858.7	4200516
539033.7	4201766	539033.7	4201791	539158.7	4201641	539133.7	4201316
539433.7	4201091	539208.7	4201216	539458.7	4201091	539883.7	4200666
539233.7	4201141	539158.7	4201341	538908.7	4201841	538933.7	4201866
538908.7	4201641	538883.7	4201816	539233.7	4201541	539433.7	4200841
539283.7	4201416	539433.7	4201116	539083.7	4201391	539383.7	4201266
539033.7	4201491	539458.7	4200941	539183.7	4201616	539258.7	4200991
539183.7	4201341	539058.7	4201441	539183.7	4201266	539108.7	4201341
539233.7	4201491	539183.7	4201316	539283.7	4200966	539383.7	4200841
539358.7	4201216	539383.7	4201191	539358.7	4201316	539233.7	4201566
539308.7	4201391	538933.7	4201591	538958.7	4201541	539133.7	4201691
538883.7	4201691	539383.7	4200866	539083.7	4201741	538908.7	4201591
539208.7	4201541	539433.7	4200866	539033.7	4201816	539208.7	4201116
538933.7	4201841	539883.7	4200491	538958.7	4201866	539083.7	4201766
539458.7	4201016	539233.7	4201516	539333.7	4201391	538983.7	4201491
539208.7	4201291	539933.7	4200616	539458.7	4200891	539933.7	4200466
539083.7	4201691	539333.7	4201366	539008.7	4201841	539958.7	4200591
539383.7	4201166	539458.7	4201066	539333.7	4200891	539483.7	4201041
539933.7	4200516	539358.7	4201266	539058.7	4201416	539483.7	4201016
539858.7	4200591	539283.7	4201441	539358.7	4200866	539408.7	4201216
539008.7	4201516	539083.7	4201716	539283.7	4201466	539333.7	4201416
539358.7	4200891	539308.7	4200941	539958.7	4200566	539083.7	4201366
539333.7	4201341	539208.7	4201566	539908.7	4200466	539183.7	4201641
539458.7	4200991	539033.7	4201466	539408.7	4201191	539233.7	4201041

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
539458.7	4200866	539083.7	4201341	539458.7	4201191	539908.7	4200716
539283.7	4201491	539133.7	4201716	539333.7	4201466	539933.7	4200441
539183.7	4201191	539258.7	4200966	539358.7	4201416	539508.7	4201066
539483.7	4200991	539308.7	4200891	539133.7	4201241	539958.7	4200466
539158.7	4201266	539358.7	4201391	539008.7	4201416	539183.7	4201091
538858.7	4201816	538983.7	4201466	539233.7	4200991	539483.7	4201166
539158.7	4201666	539458.7	4201166	539183.7	4201116	539358.7	4201441
539358.7	4201366	539958.7	4200616	539083.7	4201816	539083.7	4201291
538958.7	4201516	539858.7	4200666	539083.7	4201316	538858.7	4201641
539058.7	4201391	539158.7	4201216	538833.7	4201766	539083.7	4201841
539208.7	4201616	539833.7	4200591	539433.7	4201241	539283.7	4200891
539283.7	4200941	538908.7	4201566	539483.7	4200891	539508.7	4200966
539383.7	4201291	538958.7	4201891	539133.7	4201741	539658.7	4200891
539033.7	4201841	539408.7	4200816	539383.7	4201366	539408.7	4200791
539108.7	4201741	539183.7	4201141	539008.7	4201891	539008.7	4201391
539458.7	4201141	539108.7	4201766	539483.7	4201141	539208.7	4201016
539958.7	4200516	539433.7	4201216	539208.7	4201041	539058.7	4201866
539483.7	4201066	539133.7	4201266	539108.7	4201791	539408.7	4201341
539483.7	4200966	539458.7	4200841	538883.7	4201591	538933.7	4201491
539308.7	4201466	539183.7	4201666	539333.7	4200841	539233.7	4200966
539433.7	4201191	539058.7	4201366	538983.7	4201441	539158.7	4201141
539058.7	4201816	539408.7	4201266	538833.7	4201741	539633.7	4200891
539033.7	4201416	538983.7	4201891	539058.7	4201341	538833.7	4201716
538883.7	4201841	539383.7	4201341	539833.7	4200641	539508.7	4201091
539133.7	4201291	539308.7	4201491	539258.7	4200941	538883.7	4201866
539258.7	4201541	539208.7	4201641	538933.7	4201891	539608.7	4200866
538933.7	4201541	538958.7	4201491	539908.7	4200441	539108.7	4201241
539208.7	4201091	539208.7	4201066	538833.7	4201791	539433.7	4200791
539158.7	4201241	538908.7	4201866	539158.7	4201166	539108.7	4201816
539183.7	4201166	539483.7	4200916	539633.7	4200866	538833.7	4201816
539008.7	4201866	539833.7	4200616	538858.7	4201841	539033.7	4201891
539333.7	4200866	539433.7	4200816	539958.7	4200641	538983.7	4201916
539408.7	4201241	539658.7	4200866	539508.7	4201016	539133.7	4201191
539883.7	4200466	539883.7	4200691	539108.7	4201266	539058.7	4201316
538858.7	4201691	539833.7	4200566	539408.7	4201316	539258.7	4201566
539383.7	4201316	539483.7	4201116	539508.7	4201041	539433.7	4201291
539108.7	4201316	539033.7	4201391	538908.7	4201541	539483.7	4200841
539008.7	4201441	539283.7	4200916	539308.7	4200866	539383.7	4200791
539233.7	4201591	539383.7	4200816	539358.7	4200816	538983.7	4201416
539358.7	4200841	539108.7	4201291	539133.7	4201216	539458.7	4201241
539083.7	4201791	539058.7	4201841	539483.7	4200866	538958.7	4201916
539333.7	4201441	539158.7	4201191	539508.7	4200991	539858.7	4200691
539283.7	4201516	539658.7	4200816	539933.7	4200691	538883.7	4201566
539233.7	4201016	538858.7	4201666	538958.7	4201466	539183.7	4201066
539483.7	4200941	539633.7	4200816	539458.7	4200816	539133.7	4201791
539958.7	4200491	538933.7	4201516	539833.7	4200541	539683.7	4200866
539908.7	4200691	539033.7	4201866	539033.7	4201366	539483.7	4201191
538883.7	4201616	539233.7	4201616	539458.7	4201216	539508.7	4200941
539483.7	4201091	539408.7	4201291	539433.7	4201266	539983.7	4200566
539933.7	4200666	539858.7	4200491	539133.7	4201766	539258.7	4200916

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
539158.7	4201691	539608.7	4200841	539808.7	4200616	538808.7	4201791
539033.7	4201341	539233.7	4201641	539508.7	4201191	539983.7	4200641
539083.7	4201266	538983.7	4201391	539708.7	4200841	539508.7	4201216
539508.7	4201116	539633.7	4200791	539808.7	4200591	539183.7	4200991
539833.7	4200666	539083.7	4201241	539208.7	4201666	539158.7	4201716
539883.7	4200716	539158.7	4201091	539158.7	4201066	538858.7	4201566
538908.7	4201516	539033.7	4201316	539083.7	4201216	539633.7	4200916
539658.7	4200791	539508.7	4201166	539533.7	4201091	539583.7	4200866
539958.7	4200666	539683.7	4200816	539308.7	4200816	539858.7	4200766
539308.7	4201516	538933.7	4201916	539333.7	4200791	539933.7	4200741
538958.7	4201441	539508.7	4200891	539833.7	4200691	539158.7	4201041
539333.7	4200816	538883.7	4201541	539108.7	4201866	539533.7	4200916
539008.7	4201916	539408.7	4200766	539858.7	4200716	538958.7	4201391
539158.7	4201116	538833.7	4201841	538983.7	4201941	538833.7	4201641
539883.7	4200441	539108.7	4201191	539608.7	4200816	539008.7	4201316
539308.7	4200841	539133.7	4201141	539133.7	4201841	539508.7	4200816
538858.7	4201616	539608.7	4200891	539883.7	4200766	539983.7	4200491
539108.7	4201216	539458.7	4201291	539483.7	4200791	539258.7	4200866
539133.7	4201166	539033.7	4201916	539458.7	4200766	538908.7	4201466
539208.7	4200991	539533.7	4201016	539258.7	4201591	539533.7	4201141
539433.7	4201316	539883.7	4200741	539508.7	4200841	539083.7	4201191
539658.7	4200841	539908.7	4200741	539083.7	4201891	539833.7	4200491
539983.7	4200541	539433.7	4200766	539233.7	4200916	539733.7	4200841
539458.7	4200791	539533.7	4201041	538933.7	4201441	539858.7	4200741
539408.7	4201366	539433.7	4201341	539133.7	4201116	539133.7	4201091
539983.7	4200591	539258.7	4200891	539108.7	4201166	539208.7	4200941
538908.7	4201891	539983.7	4200616	539458.7	4201316	539708.7	4200791
539008.7	4201366	538858.7	4201866	539958.7	4200691	539808.7	4200666
538833.7	4201691	539533.7	4200991	539908.7	4200416	539483.7	4201291
539458.7	4201266	539333.7	4201491	539533.7	4200941	539908.7	4200766
539683.7	4200841	539158.7	4201791	539033.7	4201291	539108.7	4201141
539083.7	4201866	539958.7	4200441	538808.7	4201766	539408.7	4200741
539058.7	4201291	538958.7	4201416	539808.7	4200641	539433.7	4200741
539508.7	4201141	538908.7	4201491	538983.7	4201366	539583.7	4200891
539358.7	4200791	538858.7	4201591	539483.7	4201266	539533.7	4200891
539183.7	4201041	539408.7	4201391	539933.7	4200416	539033.7	4201941
539508.7	4200916	539358.7	4201466	539283.7	4200841	538808.7	4201716
539833.7	4200516	539483.7	4201241	539658.7	4200916	539033.7	4201266
539483.7	4201216	539533.7	4201066	539008.7	4201941	538908.7	4201916
539108.7	4201841	539058.7	4201266	539533.7	4201116	539158.7	4201766
539383.7	4201391	539508.7	4200866	539158.7	4201816	539133.7	4201866
538933.7	4201466	539183.7	4201016	539808.7	4200566	539483.7	4200766
539233.7	4200941	539208.7	4200966	538883.7	4201891	539433.7	4201391
539858.7	4200466	539383.7	4200766	539058.7	4201916	539658.7	4200766
539933.7	4200716	538833.7	4201666	538808.7	4201741	539108.7	4201891
539283.7	4201541	539683.7	4200891	538958.7	4201941	538808.7	4201816
539283.7	4200866	539008.7	4201341	538883.7	4201516	538983.7	4201341
539483.7	4200816	539683.7	4200791	539708.7	4200866	539508.7	4201241
539058.7	4201891	539533.7	4200966	539358.7	4200766	539583.7	4200841
539133.7	4201816	539983.7	4200516	539058.7	4201241	539533.7	4201166

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
539233.7	4200891	539558.7	4201066	538933.7	4201391	539783.7	4200666
538933.7	4201416	539683.7	4200766	538983.7	4201966	539583.7	4200991
539533.7	4200866	539483.7	4201316	539158.7	4201866	539333.7	4200741
539833.7	4200716	539808.7	4200766	539583.7	4200941	540008.7	4200566
538833.7	4201866	539758.7	4200816	539883.7	4200791	540008.7	4200591
539383.7	4200741	539583.7	4200916	539433.7	4200716	539608.7	4200766
539158.7	4201841	539883.7	4200816	539083.7	4201141	539758.7	4200741
539308.7	4200791	539983.7	4200466	539108.7	4201916	539058.7	4201166
539058.7	4201216	539758.7	4200841	539508.7	4200766	539208.7	4200891
539783.7	4200816	539558.7	4200866	539108.7	4201091	539908.7	4200391
539458.7	4201341	538958.7	4201366	539233.7	4200866	539933.7	4200391
539858.7	4200441	539858.7	4200816	538833.7	4201591	539358.7	4201491
539808.7	4200541	539833.7	4200741	539408.7	4200716	539783.7	4200591
539083.7	4201916	539533.7	4201191	539783.7	4200841	538908.7	4201416
539608.7	4200916	539508.7	4201266	539558.7	4201141	539783.7	4200716
539558.7	4200991	539833.7	4200816	539008.7	4201266	539783.7	4200691
539383.7	4201416	539708.7	4200891	539783.7	4200741	539083.7	4201116
539458.7	4200741	538808.7	4201691	539658.7	4200941	538983.7	4201291
539558.7	4201016	539958.7	4200716	539508.7	4201291	539558.7	4201166
539558.7	4200966	538908.7	4201441	539183.7	4200966	539583.7	4201016
539258.7	4201616	539958.7	4200416	539908.7	4200816	539983.7	4200441
539333.7	4200766	539033.7	4201241	539633.7	4200941	539658.7	4200741
539883.7	4200416	539933.7	4200766	538858.7	4201516	539258.7	4200816
539708.7	4200816	539208.7	4200916	538808.7	4201666	539808.7	4200791
539433.7	4201366	539058.7	4201941	538883.7	4201466	539683.7	4200741
539783.7	4200766	539558.7	4201091	539458.7	4200716	539033.7	4201966
539908.7	4200791	538858.7	4201891	539583.7	4200966	538833.7	4201566
539558.7	4200941	539258.7	4200841	538883.7	4201916	538908.7	4201941
539733.7	4200791	539633.7	4200841	539308.7	4200766	539583.7	4201041
539558.7	4201041	539758.7	4200766	539158.7	4201016	539583.7	4200791
539508.7	4200791	539358.7	4200741	539608.7	4200941	539483.7	4200716
538883.7	4201491	539708.7	4200766	538958.7	4201341	539508.7	4200741
539558.7	4200916	539983.7	4200666	539833.7	4200791	539833.7	4200841
539133.7	4201066	539733.7	4200766	539858.7	4200791	539683.7	4200941
539283.7	4200816	538808.7	4201841	539833.7	4200466	539233.7	4201666
538833.7	4201616	539558.7	4200841	539083.7	4201941	539758.7	4200866
539008.7	4201291	539533.7	4200816	539783.7	4200641	539708.7	4200916
539083.7	4201166	539733.7	4200866	539783.7	4200616	539733.7	4200741
539533.7	4200841	538983.7	4201316	539008.7	4201966	538783.7	4201766
539558.7	4200891	539733.7	4200816	539033.7	4201216	539958.7	4200741
539808.7	4200816	539808.7	4200716	539808.7	4200516	540008.7	4200541
539833.7	4200766	539058.7	4201191	539558.7	4200816	540008.7	4200616
538858.7	4201541	539558.7	4201116	539933.7	4200791	539533.7	4201266
539683.7	4200916	539808.7	4200741	539533.7	4200791	539583.7	4201066
539608.7	4200791	539533.7	4201216	539383.7	4200716	538833.7	4201891
539808.7	4200691	539483.7	4200741	539283.7	4200791	538933.7	4201366
539108.7	4201116	539583.7	4200816	538958.7	4201966	539708.7	4200741
539633.7	4200766	539133.7	4201891	539533.7	4201241	539183.7	4201816
538933.7	4201941	539183.7	4201691	539258.7	4201641	539558.7	4201191
539158.7	4201741	539758.7	4200791	539808.7	4200841	539183.7	4201791

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
538808.7	4201641	538908.7	4201391	538783.7	4201691	540008.7	4200491
539533.7	4200766	539083.7	4201966	539708.7	4200941	539483.7	4200666
539358.7	4200716	539883.7	4200841	539633.7	4200991	539258.7	4200766
539508.7	4201316	539883.7	4200391	539408.7	4201416	539733.7	4200666
538808.7	4201866	539583.7	4200766	539583.7	4201166	539608.7	4201116
539133.7	4201916	539508.7	4200716	538958.7	4201291	539608.7	4200716
539558.7	4200791	539758.7	4200691	539683.7	4200966	538933.7	4201316
538783.7	4201741	539958.7	4200391	538883.7	4201941	538908.7	4201966
539058.7	4201966	539183.7	4200941	539733.7	4200916	539933.7	4200366
539008.7	4201241	539558.7	4200766	539758.7	4200891	539183.7	4201866
539608.7	4200966	538858.7	4201916	538858.7	4201466	539008.7	4201166
539983.7	4200691	539083.7	4201091	539458.7	4201391	539908.7	4200366
539733.7	4200891	539783.7	4200866	539908.7	4200841	539558.7	4201291
539233.7	4200841	539133.7	4201041	539108.7	4201966	538833.7	4201916
539033.7	4201191	539533.7	4200741	539808.7	4200866	540008.7	4200666
539858.7	4200841	539158.7	4201891	539533.7	4201316	539583.7	4201216
539583.7	4201091	538783.7	4201816	539608.7	4201066	539558.7	4200716
539633.7	4200741	539733.7	4200716	538833.7	4201516	539683.7	4200691
539108.7	4201941	539608.7	4200741	539733.7	4200691	538958.7	4201266
539783.7	4200566	539258.7	4200791	539558.7	4200741	539383.7	4200666
539783.7	4200791	539033.7	4201166	539033.7	4201141	539783.7	4200516
538858.7	4201491	539583.7	4201141	539758.7	4200616	539233.7	4200791
538783.7	4201791	538808.7	4201616	538883.7	4201416	539583.7	4200716
539058.7	4201141	539383.7	4200691	539433.7	4200666	539383.7	4201466
539308.7	4201541	539808.7	4200491	539583.7	4200741	539508.7	4201341
539433.7	4200691	540008.7	4200516	539358.7	4200691	539633.7	4201041
539458.7	4201366	539483.7	4200691	538783.7	4201841	539183.7	4200866
539858.7	4200416	539058.7	4201116	539608.7	4201091	539783.7	4200891
539758.7	4200716	539333.7	4201516	539533.7	4200716	539533.7	4200691
539583.7	4201116	539758.7	4200666	539208.7	4200841	539058.7	4201091
538958.7	4201316	539608.7	4201016	539508.7	4200691	538808.7	4201566
538883.7	4201441	539933.7	4200816	538983.7	4201241	539183.7	4200916
539408.7	4200691	538933.7	4201341	539458.7	4200666	539133.7	4201966
539483.7	4201341	539333.7	4200716	539583.7	4201191	539333.7	4200691
539633.7	4200966	539008.7	4201216	539558.7	4201266	539958.7	4200791
539458.7	4200691	539958.7	4200766	538808.7	4201591	539858.7	4200866
539558.7	4201216	539558.7	4201241	539633.7	4200716	539608.7	4201141
539383.7	4201441	539708.7	4200716	539408.7	4200666	538983.7	4201216
539108.7	4201066	539783.7	4200541	539008.7	4201191	539683.7	4200991
538933.7	4201966	539683.7	4200716	539983.7	4200716	539658.7	4200691
539308.7	4200741	539183.7	4201841	538908.7	4201366	539708.7	4200966
539533.7	4201291	539283.7	4201566	538808.7	4201891	538783.7	4201866
538783.7	4201716	539833.7	4200441	539658.7	4200991	539808.7	4200466
539208.7	4200866	539158.7	4200991	539283.7	4200741	539183.7	4201716
539608.7	4200991	539233.7	4200816	539633.7	4201016	538833.7	4201491
539658.7	4200966	539133.7	4201941	539833.7	4200866	539508.7	4200666
539283.7	4200766	539758.7	4200641	539308.7	4200716	539858.7	4200391
538833.7	4201541	539658.7	4200716	539758.7	4200591	539758.7	4200566
540008.7	4200641	539608.7	4201041	539708.7	4200691	539733.7	4200641
538983.7	4201266	539983.7	4200416	538783.7	4201666	539058.7	4201991

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
539633.7	4201066	539033.7	4201991	539208.7	4200791	538758.7	4201666
539083.7	4201991	539533.7	4200666	538908.7	4201316	539283.7	4201591
539658.7	4201016	539683.7	4200666	540033.7	4200566	538833.7	4201466
538783.7	4201641	539183.7	4200841	539608.7	4201216	539633.7	4200641
539208.7	4200816	539658.7	4201041	539583.7	4201291	539858.7	4200891
539758.7	4200916	539158.7	4201916	538783.7	4201891	539908.7	4200341
539033.7	4201116	539258.7	4200741	539758.7	4200941	539583.7	4200641
539608.7	4201166	539158.7	4200966	539183.7	4201741	539708.7	4200591
539583.7	4201241	539433.7	4201416	538808.7	4201516	539283.7	4201641
539708.7	4200666	539583.7	4201266	539583.7	4200666	540033.7	4200641
538883.7	4201391	539608.7	4201191	539458.7	4200616	539683.7	4200616
539733.7	4200941	538958.7	4201991	539608.7	4200666	539858.7	4200366
539433.7	4200641	539683.7	4201016	539533.7	4200641	539383.7	4200616
539633.7	4200691	539308.7	4200691	538758.7	4201691	540008.7	4200416
540008.7	4200466	538758.7	4201716	539433.7	4200616	539783.7	4200941
539458.7	4200641	538783.7	4201616	539683.7	4200641	539133.7	4202016
538908.7	4201341	539233.7	4200766	539683.7	4201041	539608.7	4200641
539333.7	4201541	539758.7	4200541	539708.7	4200616	539158.7	4201941
539108.7	4201991	539708.7	4200641	539483.7	4200616	539133.7	4201016
538983.7	4201991	539908.7	4200866	539708.7	4201016	539233.7	4200741
539933.7	4200841	539708.7	4200991	539808.7	4200441	539533.7	4200616
538983.7	4201191	540033.7	4200591	538783.7	4201591	540008.7	4200716
538858.7	4201941	539383.7	4200641	539258.7	4201666	539608.7	4201266
538758.7	4201766	539508.7	4200641	539358.7	4200641	539758.7	4200966
539183.7	4201766	539983.7	4200741	539408.7	4200616	539883.7	4200891
539558.7	4200691	539633.7	4201116	539733.7	4200566	539633.7	4201191
539633.7	4201091	540008.7	4200691	539183.7	4200816	539983.7	4200366
539008.7	4201991	539658.7	4200666	540033.7	4200541	539208.7	4200766
538758.7	4201741	538883.7	4201966	538933.7	4201241	539683.7	4201066
539358.7	4200666	539958.7	4200816	538833.7	4201941	538983.7	4201166
539083.7	4201066	539733.7	4200591	539633.7	4201166	539833.7	4200391
539958.7	4200366	538958.7	4201216	539658.7	4201091	539108.7	4202016
539408.7	4200641	538858.7	4201441	539333.7	4200666	538783.7	4201566
539008.7	4201141	539658.7	4201066	539608.7	4201241	538808.7	4201491
538933.7	4201291	539208.7	4201691	539383.7	4201491	538858.7	4201966
539983.7	4200391	539558.7	4200666	539533.7	4201341	538908.7	4201266
539483.7	4201366	540008.7	4200441	539208.7	4201816	540033.7	4200516
539483.7	4200641	538883.7	4201366	538758.7	4201841	538933.7	4201216
539183.7	4200891	539783.7	4200491	539558.7	4200641	539583.7	4201316
539733.7	4200616	539783.7	4200916	539508.7	4200616	539458.7	4200591
539558.7	4201316	539133.7	4201991	539983.7	4200766	539333.7	4200641
539608.7	4200691	538758.7	4201816	539658.7	4200641	539783.7	4200466
539833.7	4200416	539833.7	4200891	539808.7	4200916	539683.7	4201091
539883.7	4200866	539633.7	4201141	538933.7	4201991	539458.7	4201416
539808.7	4200891	540033.7	4200616	539933.7	4200341	539733.7	4200541
538958.7	4201241	539733.7	4200966	539758.7	4200516	539183.7	4201891
539583.7	4200691	539633.7	4200666	539658.7	4201116	538758.7	4201866
538808.7	4201541	539283.7	4200716	539733.7	4200991	539658.7	4200616
539883.7	4200366	538933.7	4201266	538908.7	4201291	539558.7	4200616
538758.7	4201791	538808.7	4201916	538883.7	4201341	539233.7	4201691

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
539483.7	4200591	538733.7	4201741	539358.7	4200591	539708.7	4201116
539958.7	4200341	540033.7	4200666	538883.7	4201266	539658.7	4201241
539433.7	4200591	539633.7	4201241	539733.7	4201041	539808.7	4200391
539283.7	4200691	538758.7	4201616	539533.7	4200566	539258.7	4200666
539308.7	4200666	539383.7	4200591	539258.7	4200691	538733.7	4201666
539933.7	4200866	539708.7	4201066	539783.7	4200441	539183.7	4200741
539958.7	4200841	539758.7	4200991	539158.7	4200841	539733.7	4200491
539658.7	4201141	539683.7	4201116	539683.7	4201141	539483.7	4200541
538758.7	4201641	538883.7	4201991	538758.7	4201591	538758.7	4201566
539708.7	4201041	539283.7	4200666	539158.7	4201991	538783.7	4201491
539183.7	4200791	539658.7	4200591	539833.7	4200941	540058.7	4200591
539158.7	4201966	539558.7	4200591	539483.7	4201416	539983.7	4200816
538908.7	4201991	539108.7	4201041	539408.7	4200566	538833.7	4201441
539358.7	4200616	540008.7	4200391	539158.7	4200866	538783.7	4201941
539258.7	4200716	538733.7	4201791	539058.7	4201066	539708.7	4200516
539633.7	4201216	539783.7	4200966	538858.7	4201316	539458.7	4200541
539033.7	4201091	539333.7	4200616	538733.7	4201691	539958.7	4200316
538858.7	4201416	539358.7	4201516	539208.7	4201716	539158.7	4202016
539508.7	4200591	539208.7	4201791	539833.7	4200366	539508.7	4200541
539608.7	4201291	539508.7	4201366	539758.7	4201016	538858.7	4201291
539833.7	4200916	539208.7	4201841	539983.7	4200341	539633.7	4201291
539583.7	4200616	540033.7	4200491	539133.7	4200991	538883.7	4201241
539283.7	4201616	539983.7	4200791	539658.7	4201216	538758.7	4201916
539408.7	4200591	539208.7	4200741	540033.7	4200691	538808.7	4201466
539708.7	4200566	538758.7	4201891	539658.7	4200566	539083.7	4202016
539683.7	4200591	538733.7	4201716	539558.7	4200566	539958.7	4200866
539633.7	4200616	539733.7	4200516	539858.7	4200341	540008.7	4200366
539883.7	4200341	539858.7	4200916	539933.7	4200316	539433.7	4200541
538883.7	4201316	539458.7	4200566	538858.7	4201391	539133.7	4202041
538783.7	4201916	539583.7	4200591	539308.7	4200616	539858.7	4200941
539608.7	4200616	539483.7	4200566	539283.7	4200641	539408.7	4201466
538958.7	4201191	539183.7	4200766	539783.7	4200991	539533.7	4200541
538858.7	4201366	539658.7	4201191	539208.7	4200716	539158.7	4200791
539733.7	4201016	539233.7	4200716	539908.7	4200316	539758.7	4201041
539158.7	4200941	539683.7	4200566	539883.7	4200916	539158.7	4200916
538783.7	4201541	539633.7	4200591	539158.7	4200816	539233.7	4200691
539533.7	4200591	539633.7	4201266	539583.7	4200566	539158.7	4200891
539408.7	4201441	539558.7	4201341	540033.7	4200466	539008.7	4202016
539483.7	4201391	540008.7	4200741	539758.7	4200466	539358.7	4200566
538908.7	4201241	539433.7	4200566	539733.7	4201066	540058.7	4200566
538808.7	4201941	538783.7	4201516	539633.7	4200566	539258.7	4200641
539008.7	4201116	538833.7	4201966	539383.7	4200566	539658.7	4200541
539808.7	4200416	539608.7	4200591	538733.7	4201841	539558.7	4200541
539758.7	4200491	539708.7	4200541	538908.7	4201216	539683.7	4201191
539658.7	4201166	539208.7	4201866	538858.7	4201991	539883.7	4200316
538883.7	4201291	539508.7	4200566	539808.7	4200966	539283.7	4200616
539908.7	4200891	538733.7	4201816	539683.7	4201166	539933.7	4200891
538733.7	4201766	538858.7	4201341	539333.7	4200591	539658.7	4201266
539808.7	4200941	539308.7	4201566	539608.7	4200566	538808.7	4201966
539308.7	4200641	539708.7	4201091	539683.7	4200541	538733.7	4201641

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
539483.7	4201441	538708.7	4201766	539833.7	4200991	539783.7	4201066
540033.7	4200441	539733.7	4201116	539908.7	4200291	539233.7	4200616
539733.7	4201091	539533.7	4200516	538783.7	4201966	539933.7	4200916
539783.7	4201016	539308.7	4201591	538708.7	4201816	539433.7	4200491
538733.7	4201866	538883.7	4201216	538708.7	4201691	539433.7	4201466
539408.7	4200541	539708.7	4201166	539858.7	4200966	539283.7	4200566
539708.7	4201141	540058.7	4200641	539058.7	4202016	539208.7	4201891
540033.7	4200716	540033.7	4200416	538933.7	4202016	540058.7	4200491
539583.7	4200541	539558.7	4200516	540008.7	4200791	539758.7	4201116
539433.7	4201441	539658.7	4200516	539758.7	4201091	538783.7	4201466
539233.7	4200666	539983.7	4200316	539783.7	4200391	539558.7	4201366
539308.7	4200591	539883.7	4200941	539183.7	4200691	539683.7	4201266
539333.7	4201566	539208.7	4201766	539308.7	4201616	539708.7	4201191
539633.7	4200541	538733.7	4201891	540058.7	4200666	539208.7	4200641
539833.7	4200966	539258.7	4200616	539958.7	4200291	539733.7	4201166
539908.7	4200916	539433.7	4200516	539308.7	4201641	539808.7	4201041
539208.7	4200691	538958.7	4202016	539983.7	4200841	539183.7	4201916
539283.7	4201666	538708.7	4201791	539133.7	4200966	538883.7	4202016
539783.7	4200416	538708.7	4201716	538858.7	4201241	539358.7	4200516
539608.7	4200541	538758.7	4201516	539483.7	4200491	539358.7	4201566
539808.7	4200991	539583.7	4200516	539508.7	4200491	539908.7	4200941
538758.7	4201541	539283.7	4200591	539958.7	4200891	538833.7	4201266
539608.7	4201316	539808.7	4200366	539708.7	4200466	540058.7	4200691
540058.7	4200616	539583.7	4201341	540033.7	4200391	539683.7	4200466
538983.7	4201141	539683.7	4201241	538758.7	4201491	539833.7	4201016
538983.7	4202016	539158.7	4202041	539333.7	4200541	539833.7	4200316
540008.7	4200766	539233.7	4200641	539533.7	4200491	538833.7	4201366
539683.7	4200516	539633.7	4200516	539558.7	4200491	539333.7	4201591
539258.7	4201691	539858.7	4200316	539383.7	4200516	539808.7	4200341
539358.7	4201541	539233.7	4201716	539658.7	4200491	539408.7	4200491
539208.7	4201741	539033.7	4202016	538858.7	4202016	538833.7	4201316
538858.7	4201266	539358.7	4200541	538733.7	4201566	539308.7	4200541
540058.7	4200541	539608.7	4200516	539458.7	4200491	538708.7	4201641
539683.7	4201216	539783.7	4201041	538933.7	4201191	538733.7	4201541
539333.7	4200566	539158.7	4200766	538833.7	4201291	539233.7	4201816
539383.7	4200541	538733.7	4201591	538733.7	4201916	539183.7	4200666
538733.7	4201616	539158.7	4200741	539583.7	4200491	539183.7	4202066
539183.7	4200716	539933.7	4200291	539658.7	4201291	538833.7	4201341
539708.7	4200491	539383.7	4201516	539183.7	4202041	538708.7	4201866
539458.7	4201441	540058.7	4200516	539758.7	4200416	539558.7	4200466
538833.7	4201991	539208.7	4200666	538908.7	4202016	539983.7	4200291
539483.7	4200516	539408.7	4201491	538808.7	4201991	539858.7	4200991
539758.7	4200441	540008.7	4200341	539633.7	4200491	538833.7	4202016
539508.7	4200516	540033.7	4200741	539608.7	4200491	539308.7	4201666
539758.7	4201066	539408.7	4200516	539733.7	4200441	539533.7	4200466
539458.7	4200516	538758.7	4201941	538708.7	4201666	539583.7	4200466
539833.7	4200341	539308.7	4200566	539258.7	4200591	539233.7	4201741
539733.7	4200466	539683.7	4200491	538708.7	4201841	539508.7	4200466
539533.7	4201366	539808.7	4201016	539033.7	4201066	539658.7	4200466
538708.7	4201741	539733.7	4201141	539883.7	4200291	539883.7	4200966

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
540008.7	4200816	539708.7	4201216	539583.7	4201366	538958.7	4201166
539483.7	4200466	539908.7	4200266	540083.7	4200541	539508.7	4200416
540033.7	4200366	539683.7	4200441	538708.7	4201916	539308.7	4200491
539758.7	4201141	538683.7	4201716	539333.7	4200491	539158.7	4202066
540008.7	4200316	539383.7	4201541	539733.7	4200391	539958.7	4200941
539783.7	4200366	539933.7	4200941	540083.7	4200641	540083.7	4200516
539158.7	4200716	538708.7	4201591	539758.7	4200366	539133.7	4200741
539608.7	4200466	539483.7	4201466	539258.7	4200541	539483.7	4200416
538833.7	4201416	539183.7	4200641	539333.7	4201641	539333.7	4201666
539083.7	4201041	538683.7	4201791	539208.7	4200591	539708.7	4200391
538758.7	4201466	539358.7	4200491	538683.7	4201666	538833.7	4202041
539708.7	4200441	539958.7	4200266	540083.7	4200616	538833.7	4201241
539633.7	4200466	539333.7	4201616	540008.7	4200291	539883.7	4200991
539183.7	4202016	540083.7	4200566	539433.7	4200441	538783.7	4202016
539858.7	4200291	539308.7	4200516	538833.7	4201391	539308.7	4201691
539383.7	4200491	539233.7	4201766	539683.7	4200416	538708.7	4201941
538708.7	4201616	539558.7	4200441	539283.7	4200516	539933.7	4200966
539333.7	4200516	539408.7	4200466	539908.7	4200966	539933.7	4200241
538758.7	4201966	539583.7	4200441	539183.7	4200616	538683.7	4201866
539458.7	4200466	539533.7	4200441	539983.7	4200266	540058.7	4200766
539258.7	4201716	539408.7	4201516	539608.7	4201341	539458.7	4200416
539458.7	4201466	539658.7	4200441	539008.7	4201091	539808.7	4200291
539233.7	4200591	539508.7	4200441	539258.7	4201741	540033.7	4200316
539733.7	4200416	538808.7	4202016	538683.7	4201841	539208.7	4200566
539758.7	4200391	538683.7	4201691	538733.7	4201466	538683.7	4201616
539258.7	4200566	539608.7	4200441	539758.7	4201166	540058.7	4200391
539958.7	4200916	539483.7	4200441	540058.7	4200416	539783.7	4200316
538733.7	4201941	539858.7	4201016	539383.7	4201566	539233.7	4200541
539158.7	4200691	539808.7	4200316	539558.7	4200416	539358.7	4201616
540058.7	4200466	538733.7	4201491	538733.7	4201966	539183.7	4201941
539783.7	4201091	539633.7	4200441	539833.7	4201066	539733.7	4200366
539808.7	4201066	539708.7	4200416	538758.7	4201991	539133.7	4200716
539283.7	4201691	540058.7	4200441	539708.7	4201241	538708.7	4201516
540058.7	4200716	539883.7	4200266	539858.7	4200266	539383.7	4200441
538808.7	4201441	539158.7	4200666	539233.7	4201866	539908.7	4200241
539208.7	4200616	538683.7	4201816	538708.7	4201541	539183.7	4201991
539108.7	4202041	540033.7	4200341	539583.7	4200416	539758.7	4200341
540033.7	4200766	539433.7	4201491	539358.7	4200466	538908.7	4201191
539933.7	4200266	539358.7	4201591	539658.7	4200416	539183.7	4201966
538683.7	4201741	539833.7	4200291	539983.7	4200866	540083.7	4200691
538783.7	4201991	539208.7	4202066	539533.7	4200416	539258.7	4200516
539433.7	4200466	539783.7	4200341	539208.7	4202041	540033.7	4200816
539108.7	4201016	539233.7	4201841	539408.7	4200441	539683.7	4200391
538683.7	4201766	538708.7	4201566	540083.7	4200666	539333.7	4200466
539283.7	4200541	540058.7	4200741	539608.7	4200416	539408.7	4201541
539633.7	4201316	539458.7	4200441	538683.7	4201641	539183.7	4202091
539833.7	4201041	539233.7	4200566	539508.7	4201391	539683.7	4201291
538733.7	4201516	540033.7	4200791	539158.7	4200641	539183.7	4200591
539233.7	4201791	539383.7	4200466	539283.7	4201716	539958.7	4200241
538708.7	4201891	540083.7	4200591	539633.7	4200416	539133.7	4200766

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
539058.7	4201041	540083.7	4200716	538683.7	4201541	538658.7	4201866
539258.7	4201766	538733.7	4201991	539533.7	4200366	539633.7	4200341
539433.7	4200416	539133.7	4200791	538783.7	4202041	539208.7	4200516
538983.7	4201116	539358.7	4201641	539208.7	4201916	540108.7	4200541
539133.7	4200691	539983.7	4200241	539383.7	4201616	539783.7	4200266
539833.7	4200266	538658.7	4201691	539283.7	4200466	539408.7	4201591
539558.7	4200391	538783.7	4201441	538658.7	4201841	539458.7	4201516
539458.7	4201491	539458.7	4200391	540058.7	4200341	540108.7	4200616
538658.7	4201741	539008.7	4202041	539508.7	4200366	538808.7	4201316
539583.7	4200391	538683.7	4201566	539708.7	4200341	539133.7	4200816
539283.7	4200491	539208.7	4200541	539933.7	4200216	539333.7	4200416
539208.7	4202091	539733.7	4200341	539358.7	4200416	539883.7	4201016
539658.7	4200391	539858.7	4200241	539358.7	4201666	539433.7	4200366
538983.7	4202041	539258.7	4201816	539133.7	4200641	539158.7	4200566
540083.7	4200491	538658.7	4201816	539408.7	4200391	538808.7	4202066
538658.7	4201766	538708.7	4201966	539833.7	4200241	539333.7	4201716
539233.7	4202066	538758.7	4202016	539483.7	4200366	539258.7	4200466
539883.7	4200241	539683.7	4200366	539908.7	4200216	539583.7	4200341
539733.7	4201191	538808.7	4201366	539283.7	4201766	538733.7	4202016
539158.7	4200616	539308.7	4201716	538658.7	4201641	539983.7	4200916
539608.7	4200391	538883.7	4202041	539658.7	4201316	538708.7	4201991
538683.7	4201591	539233.7	4200516	539558.7	4201391	539558.7	4200341
539633.7	4200391	539383.7	4200416	540058.7	4200791	539033.7	4201041
539383.7	4201591	539783.7	4200291	539508.7	4201416	539258.7	4201841
538808.7	4202041	539758.7	4200316	539958.7	4200216	540083.7	4200766
539533.7	4200391	538683.7	4201916	539308.7	4200441	539258.7	4202091
538683.7	4201891	539333.7	4201691	539433.7	4201541	539533.7	4200341
539358.7	4200441	539708.7	4201266	538683.7	4201941	540033.7	4200266
538658.7	4201716	539183.7	4200566	539683.7	4200341	539383.7	4201641
539433.7	4201516	540033.7	4200291	539733.7	4200316	539808.7	4200241
539508.7	4200391	539258.7	4200491	539458.7	4200366	539133.7	4202066
540008.7	4200841	539783.7	4201116	539908.7	4200991	539983.7	4200216
539583.7	4201391	539408.7	4201566	538683.7	4201516	539133.7	4200916
539858.7	4201041	539333.7	4200441	539883.7	4200216	540058.7	4200316
539133.7	4200941	539808.7	4200266	539083.7	4201016	539858.7	4200216
539408.7	4200416	539583.7	4200366	540083.7	4200441	539708.7	4200316
540008.7	4200266	539658.7	4200366	540008.7	4200241	539283.7	4201791
538658.7	4201791	539433.7	4200391	539758.7	4200291	539133.7	4200616
539708.7	4200366	540083.7	4200466	539308.7	4201741	540108.7	4200641
539108.7	4200991	539233.7	4202091	538808.7	4201266	539808.7	4201091
538708.7	4201491	539608.7	4200366	538808.7	4201291	539183.7	4200541
539133.7	4200666	538658.7	4201666	539658.7	4200341	539233.7	4202116
538858.7	4202041	539633.7	4200366	539483.7	4201491	538633.7	4201741
539258.7	4201791	538708.7	4201466	538883.7	4201191	539508.7	4200341
539483.7	4200391	538958.7	4202041	538708.7	4201441	539033.7	4202041
540058.7	4200366	539158.7	4200591	538658.7	4201616	539283.7	4200441
539233.7	4201891	539558.7	4200366	539533.7	4201391	538658.7	4201591
539283.7	4201741	538808.7	4201341	539383.7	4200391	540108.7	4200591
538858.7	4201216	540083.7	4200741	539233.7	4200491	538683.7	4201491
539308.7	4200466	539958.7	4200966	539608.7	4200341	538633.7	4201766

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY	UTMX	UTMY	UTMX	UTMY
538808.7	4201416	539383.7	4200366	538633.7	4201841	539333.7	4201766
540108.7	4200566	538633.7	4201816	539108.7	4200641	539383.7	4200341
540083.7	4200416	540083.7	4200391	540033.7	4200241	538633.7	4201866
538758.7	4202041	539933.7	4200191	539358.7	4201716	539533.7	4201416
539358.7	4201691	539783.7	4201141	539483.7	4201966	539333.7	4200366
539508.7	4201441	538933.7	4202041	539358.7	4200366	540108.7	4200766
539358.7	4200391	539208.7	4200491	539483.7	4200316	539708.7	4201291
539983.7	4200891	539383.7	4201666	539733.7	4200266	539533.7	4200291
539933.7	4200991	539583.7	4200316	538708.7	4202016	540108.7	4200466
539133.7	4200591	539783.7	4200241	539108.7	4200691	539833.7	4200191
539483.7	4200341	539558.7	4200316	539433.7	4201591	539983.7	4200941
539408.7	4200366	539333.7	4200391	540083.7	4200366	539258.7	4200416
538633.7	4201716	539283.7	4201816	539408.7	4200341	538658.7	4201516
540108.7	4200516	539908.7	4200191	540108.7	4200741	539108.7	4200716
539758.7	4201191	539258.7	4201866	539658.7	4200291	539758.7	4200241
538658.7	4201891	538683.7	4201466	539208.7	4201941	540083.7	4200341
538758.7	4201441	539233.7	4201916	538908.7	4202041	539433.7	4200316
538733.7	4201441	538658.7	4201916	538733.7	4202041	538808.7	4201241
540108.7	4200666	539133.7	4200891	539633.7	4200291	539458.7	4201991
539683.7	4200316	539333.7	4201741	539133.7	4200866	539383.7	4202066
538683.7	4201966	540108.7	4200716	539408.7	4201641	538633.7	4201616
538633.7	4201791	539258.7	4200441	538633.7	4201641	540033.7	4200841
539208.7	4202016	539433.7	4200341	539858.7	4200191	539508.7	4200291
539208.7	4202116	539708.7	4200291	538683.7	4201991	539458.7	4201566
539733.7	4200291	539533.7	4200316	539308.7	4200391	539283.7	4201841
539433.7	4201566	539958.7	4200191	538708.7	4201391	539683.7	4201316
539308.7	4200416	538633.7	4201666	539258.7	4201891	539283.7	4202116
539608.7	4201366	539158.7	4200541	539983.7	4200191	539783.7	4200216
539733.7	4201216	540108.7	4200491	538658.7	4201941	539433.7	4201616
539083.7	4202041	538658.7	4201541	539108.7	4200616	540058.7	4200266
539658.7	4200316	539508.7	4201466	539308.7	4202116	539483.7	4201941
539858.7	4201066	539633.7	4201341	539308.7	4201791	539408.7	4201666
539633.7	4200316	540008.7	4200216	538683.7	4201441	539283.7	4200391
538658.7	4201566	539058.7	4202041	539458.7	4200316	539783.7	4201166
539458.7	4200341	539133.7	4200841	539258.7	4202116	538683.7	4201416
540108.7	4200691	540058.7	4200291	539383.7	4201691	539083.7	4200991
538708.7	4201416	538783.7	4201366	539608.7	4201391	539708.7	4200266
539833.7	4200216	539883.7	4200191	539233.7	4200441	539358.7	4201741
540058.7	4200816	539458.7	4201541	539233.7	4202041	538608.7	4201741
539308.7	4201766	539108.7	4200666	539583.7	4200291	539208.7	4201966
539108.7	4200966	539133.7	4200566	539608.7	4200291	539933.7	4200166
539758.7	4200266	539508.7	4200316	539183.7	4200491	538658.7	4201966
538633.7	4201691	538858.7	4202066	539733.7	4201241	539483.7	4200291
539408.7	4201616	539308.7	4202091	539333.7	4202091	539508.7	4201491
539233.7	4200466	539483.7	4201516	538808.7	4202091	539908.7	4200166
539258.7	4202066	539283.7	4200416	539558.7	4200291	538633.7	4201591
538833.7	4202066	539183.7	4200516	538808.7	4201391	538608.7	4201766
539283.7	4202091	539008.7	4201066	539208.7	4200466	539408.7	4202041
538783.7	4202066	539808.7	4200216	539358.7	4202066	539408.7	4202066
539608.7	4200316	539683.7	4200291	538758.7	4202066	538608.7	4201716

Table 6: Receptors

UTMX	UTMY	UTMX	UTMY
539158.7	4200516	539333.7	4201791
539058.7	4201016	539333.7	4202066
539958.7	4200991	539108.7	4200741
539358.7	4200341	539433.7	4201641
539108.7	4200591	540008.7	4200866
539408.7	4200316	539458.7	4201591
539458.7	4202016	539533.7	4200266
538783.7	4202091	539858.7	4200166
539433.7	4202041	539258.7	4200391
540008.7	4200191	539383.7	4200316
538633.7	4201891	539533.7	4201441
539958.7	4200166	538658.7	4201466
539808.7	4200191	538608.7	4201816
538658.7	4201491	538733.7	4202066
540033.7	4200216	539408.7	4201691
539308.7	4200366	539458.7	4201966
539883.7	4200166	539983.7	4200166
539333.7	4202116	539508.7	4200266
539308.7	4201816	539833.7	4201091
540083.7	4200791	538833.7	4202091
539683.7	4200266	539758.7	4200216
539383.7	4201716	539283.7	4201866
539433.7	4202016	539433.7	4200291
539133.7	4200541	539108.7	4200566
539458.7	4200291	539333.7	4200341
538608.7	4201791	539383.7	4202041
539233.7	4202141	538633.7	4201916
538633.7	4201566	539358.7	4201766
539183.7	4200466	538608.7	4201666
539608.7	4200266	538983.7	4201091
539633.7	4200266	539258.7	4202141
539233.7	4200416	539883.7	4201041
539483.7	4201541	539433.7	4202066
539658.7	4200266	539133.7	4200516
539733.7	4200241	539833.7	4200166
539158.7	4200491	539733.7	4201266
539583.7	4200266	539283.7	4200366
539358.7	4202091	538783.7	4201341
538608.7	4201691	539708.7	4200241
540108.7	4200441	539783.7	4200191
539208.7	4201991	538658.7	4201991
539483.7	4201991	540133.7	4200691
539558.7	4200266	540058.7	4200241
540083.7	4200316	539233.7	4201941
538708.7	4202041	539483.7	4200266
539208.7	4200441	540133.7	4200566
538683.7	4202016	539558.7	4201416
540133.7	4200541	539483.7	4201916
539108.7	4200941	539283.7	4202066
539258.7	4201916	540133.7	4200616

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Sir Francis Drake	VOLUME	SFD1	540945.2656	4200442.565	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540927.7293	4200452.181	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540910.1931	4200461.798	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540892.6568	4200471.415	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540875.1206	4200481.031	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540857.5843	4200490.648	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540840.0481	4200500.265	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540822.5118	4200509.881	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540804.9756	4200519.498	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540787.4393	4200529.115	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540769.9031	4200538.731	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540754.6133	4200551.457	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540739.977	4200565.087	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540725.3407	4200578.717	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540710.7044	4200592.347	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540696.068	4200605.977	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540681.4317	4200619.607	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540666.7954	4200633.237	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540652.1591	4200646.867	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540637.2549	4200660.133	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540619.8736	4200670.027	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540602.4924	4200679.921	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540584.9006	4200689.339	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540565.8903	4200695.553	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540546.88	4200701.767	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540527.8698	4200707.98	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540508.8595	4200714.194	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540489.8493	4200720.408	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540470.839	4200726.621	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540451.8288	4200732.835	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540432.8185	4200739.049	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540413.8082	4200745.263	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540394.798	4200751.476	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540375.7877	4200757.69	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540356.7775	4200763.904	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540337.5931	4200769.383	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540317.8168	4200772.366	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540298.0405	4200775.349	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540278.2642	4200778.332	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540258.4879	4200781.315	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540238.7117	4200784.298	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540218.9354	4200787.281	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540199.1584	4200790.013	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540179.3661	4200787.138	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540159.5738	4200784.264	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540139.7815	4200781.389	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540119.9892	4200778.514	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540100.1969	4200775.639	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540080.4046	4200772.764	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540060.6123	4200769.889	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540040.6955	4200770.877	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540020.7592	4200772.472	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD1	540000.8229	4200774.067	0.018867925	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539994.7746	4200776.516	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539977.0103	4200785.705	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539959.2459	4200794.893	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539941.4816	4200804.082	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539924.853	4200814.762	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539911.2692	4200829.441	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539897.6854	4200844.121	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539884.1016	4200858.8	0.052632	3.048	9.30232558	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Sir Francis Drake	VOLUME	SFD2	539870.5179	4200873.479	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539856.9341	4200888.158	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539843.3503	4200902.838	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539829.7665	4200917.517	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539816.1827	4200932.196	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539802.5989	4200946.875	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539789.0151	4200961.555	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539775.4313	4200976.234	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539761.8475	4200990.913	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539748.2638	4201005.592	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD2	539734.68	4201020.272	0.052632	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539716.2301	4201036.184	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539700.7671	4201048.868	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539685.3041	4201061.553	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539669.8412	4201074.237	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539654.3782	4201086.922	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539638.9152	4201099.606	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539623.641	4201112.513	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539608.6177	4201125.715	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539593.5944	4201138.918	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539578.5711	4201152.12	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539563.5478	4201165.322	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539548.5245	4201178.525	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD3	539533.5012	4201191.727	0.076923	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539510.8574	4201212.735	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539496.3972	4201226.552	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539481.937	4201240.369	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539467.4768	4201254.186	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539453.0166	4201268.002	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539438.5565	4201281.819	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539424.0963	4201295.636	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539409.6361	4201309.453	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539395.1759	4201323.269	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539380.7157	4201337.086	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539366.2555	4201350.903	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539351.7953	4201364.72	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539337.3351	4201378.536	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539322.8749	4201392.353	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539308.4147	4201406.17	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539293.835	4201419.859	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539279.0552	4201433.333	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539264.2754	4201446.807	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539249.4956	4201460.282	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539234.7158	4201473.756	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539219.936	4201487.23	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539205.4309	4201500.997	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539191.0441	4201514.89	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539176.6573	4201528.784	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539162.2704	4201542.677	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539147.8836	4201556.57	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539133.4968	4201570.463	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD4	539117.7755	4201585.645	0.035714	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD5	539106.8819	4201602.418	0.111111	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD5	539095.9883	4201619.191	0.111111	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD5	539085.0946	4201635.963	0.111111	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD5	539074.5118	4201652.924	0.111111	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD5	539064.7304	4201670.369	0.111111	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD5	539054.949	4201687.814	0.111111	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD5	539045.1677	4201705.259	0.111111	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD5	539035.3863	4201722.704	0.111111	3.048	9.30232558	3.2
Sir Francis Drake	VOLUME	SFD5	539025.6049	4201740.149	0.111111	3.048	9.30232558	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
College	VOLUME	COL1	539655.8799	4200829.216	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539651.7937	4200817.933	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539647.7076	4200806.65	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539643.6215	4200795.367	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539639.5353	4200784.084	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539635.4492	4200772.801	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539631.363	4200761.519	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539627.2769	4200750.236	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539623.1908	4200738.953	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539619.1046	4200727.67	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539615.0185	4200716.387	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539610.9324	4200705.104	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539606.8462	4200693.821	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539602.7601	4200682.538	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539598.6739	4200671.256	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539594.5878	4200659.973	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539590.5017	4200648.69	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539586.2416	4200637.474	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539581.7331	4200626.353	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539577.2247	4200615.232	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539572.7162	4200604.111	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539568.2078	4200592.99	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539566.7407	4200581.126	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539565.6136	4200569.179	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539564.4865	4200557.232	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539563.3594	4200545.285	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539562.2324	4200533.338	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539561.1053	4200521.391	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539560.8533	4200509.398	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539560.7177	4200497.399	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539560.5822	4200485.4	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539560.4466	4200473.401	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539560.311	4200461.401	0.029412	3.048	5.58139535	3.2
College	VOLUME	COL1	539659.966	4200840.499	0.029412	3.048	5.58139535	3.2
Unit 2 Area	VOLUME	2A1	539664.6098	4200851.578	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539669.1674	4200862.679	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539673.7249	4200873.78	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539678.2825	4200884.881	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539682.84	4200895.981	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539687.3976	4200907.082	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539691.9551	4200918.183	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539696.5127	4200929.284	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539701.0702	4200940.385	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539705.6278	4200951.486	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539710.1853	4200962.587	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539714.7429	4200973.687	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539719.3004	4200984.788	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539723.8579	4200995.889	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539727.4892	4201007.299	0.062500	3.048	2.79069767	3.2
Unit 2 Area	VOLUME	2A1	539730.5032	4201018.914	0.062500	3.048	2.79069767	3.2
Magnolia	VOLUME	MAG1	539560.8394	4200445.037	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539561.4173	4200433.05	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539561.9952	4200421.064	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539562.5731	4200409.078	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539563.151	4200397.092	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539563.7289	4200385.106	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539564.3068	4200373.12	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539564.8847	4200361.134	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539565.4626	4200349.148	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539566.0405	4200337.162	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539566.6184	4200325.176	0.009524	3.048	5.58139535	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Magnolia	VOLUME	MAG1	539567.1963	4200313.19	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539567.7742	4200301.204	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539568.3521	4200289.218	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539568.93	4200277.231	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539570.9661	4200265.482	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539574.2049	4200253.927	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539577.4437	4200242.372	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539580.6825	4200230.818	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539587.6984	4200221.374	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539595.8439	4200212.562	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539603.9894	4200203.751	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539612.1349	4200194.939	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539620.8266	4200186.763	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539630.7719	4200180.048	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539640.7172	4200173.333	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539650.6625	4200166.618	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539660.6078	4200159.903	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539670.5531	4200153.188	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539680.4984	4200146.473	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539690.4437	4200139.758	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539700.389	4200133.043	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539710.3343	4200126.328	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539720.2796	4200119.613	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539730.2249	4200112.898	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539740.1702	4200106.183	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539750.0554	4200099.382	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539759.8006	4200092.38	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539769.5459	4200085.378	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539779.2911	4200078.375	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539789.0364	4200071.373	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539798.7816	4200064.371	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539808.5269	4200057.369	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539818.2721	4200050.367	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539828.0174	4200043.365	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539837.7626	4200036.362	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539847.5079	4200029.36	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539857.2531	4200022.358	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539866.9984	4200015.356	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539876.7436	4200008.354	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539886.4889	4200001.352	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539896.2341	4199994.35	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539905.9794	4199987.347	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539915.7246	4199980.345	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539925.4699	4199973.343	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539935.2151	4199966.341	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539944.9604	4199959.339	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539954.7057	4199952.337	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539964.4509	4199945.335	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539974.5342	4199938.878	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539985.1397	4199933.263	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	539995.7451	4199927.648	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540006.3506	4199922.034	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540016.956	4199916.419	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540027.5615	4199910.804	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540038.1669	4199905.19	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540048.7724	4199899.575	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540059.3779	4199893.96	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540069.3634	4199887.452	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540078.3399	4199879.488	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540087.3165	4199871.524	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540096.293	4199863.56	0.009524	3.048	5.58139535	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Magnolia	VOLUME	MAG1	540105.2695	4199855.597	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540114.246	4199847.633	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540123.2226	4199839.669	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540131.6738	4199831.264	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540137.9701	4199821.048	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540144.2664	4199810.833	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540150.5628	4199800.618	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540156.8591	4199790.402	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540163.2133	4199780.227	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540170.7086	4199770.856	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540178.2038	4199761.485	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540185.6991	4199752.113	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540193.1943	4199742.742	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540200.6896	4199733.371	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540209.0819	4199724.924	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540218.6719	4199717.71	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540228.2619	4199710.497	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540237.8519	4199703.284	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540247.4419	4199696.07	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540257.0319	4199688.857	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540266.6219	4199681.644	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540276.2119	4199674.43	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540285.8018	4199667.217	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540295.3918	4199660.004	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540304.9818	4199652.79	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540314.5718	4199645.577	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540324.694	4199639.157	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540335.0068	4199633.022	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540345.3197	4199626.886	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540355.6326	4199620.751	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540365.9455	4199614.615	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540376.2584	4199608.48	0.009524	3.048	5.58139535	3.2
Magnolia	VOLUME	MAG1	540386.5712	4199602.344	0.009524	3.048	5.58139535	3.2
Lower Channel	VOLUME	LC1	539905.9363	4200665.273	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539911.9358	4200665.197	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539917.9353	4200665.12	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539923.9348	4200665.044	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539929.9344	4200664.967	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539935.9339	4200664.891	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539941.9334	4200664.814	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539947.9329	4200664.738	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539953.9324	4200664.661	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539959.9319	4200664.585	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539965.9314	4200664.508	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539971.9309	4200664.431	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539977.9305	4200664.355	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539983.93	4200664.278	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539989.8436	4200664.66	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539995.4075	4200666.905	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540000.9715	4200669.151	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540006.5355	4200671.396	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540012.0995	4200673.642	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540017.6634	4200675.887	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540023.2274	4200678.133	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540028.7914	4200680.378	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540034.3553	4200682.624	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540032.4321	4200687.846	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540029.9295	4200693.3	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540027.4269	4200698.753	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540024.9242	4200704.206	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540022.4216	4200709.659	0.025641	3.048	2.79069767	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Lower Channel	VOLUME	LC1	540019.919	4200715.112	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540017.4164	4200720.565	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540014.9137	4200726.019	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540012.4111	4200731.472	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540009.9085	4200736.925	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540007.4058	4200742.378	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540005.0384	4200747.88	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540003.4543	4200753.667	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540001.8702	4200759.454	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	540000.2861	4200765.242	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC1	539998.702	4200771.029	0.025641	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539665.7874	4200839.046	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539671.6089	4200837.593	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539677.1648	4200835.394	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539682.407	4200832.475	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539688.1265	4200830.679	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539693.9303	4200829.163	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539699.7515	4200827.709	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539705.5727	4200826.255	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539711.2948	4200824.453	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539716.8795	4200822.276	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539722.398	4200819.921	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539727.8973	4200817.522	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539733.3714	4200815.065	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539738.8455	4200812.609	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539744.3196	4200810.152	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539749.7938	4200807.696	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539755.3505	4200805.435	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539760.9991	4200803.414	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539766.7296	4200801.644	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539772.5514	4200800.204	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539778.487	4200799.363	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539784.4801	4200799.373	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539790.438	4200800.034	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539796.3734	4200800.912	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539802.3099	4200801.782	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539808.2777	4200802.402	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539814.2525	4200802.937	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539820.2428	4200803.278	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539826.2394	4200803.463	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539832.2376	4200803.609	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539838.2359	4200803.754	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539844.2308	4200803.997	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539850.2257	4200804.204	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539856.2002	4200803.745	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539862.0843	4200802.586	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539867.8619	4200800.977	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539873.4679	4200798.862	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539878.8133	4200796.137	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539883.9769	4200793.086	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539888.9113	4200789.675	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539893.6232	4200785.963	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539897.9663	4200781.826	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539901.9027	4200777.323	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539905.1813	4200772.304	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539907.7942	4200766.909	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539909.8039	4200761.26	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539911.1119	4200755.407	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539911.9876	4200749.473	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539912.4889	4200743.497	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539912.7987	4200737.507	0.016129	3.048	2.79069767	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Lower Channel	VOLUME	LC2	539912.7907	4200731.507	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539912.4004	4200725.521	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539911.7255	4200719.562	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539910.7491	4200713.646	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539909.4179	4200707.796	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539908.0868	4200701.945	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539906.7556	4200696.095	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539905.4244	4200690.245	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539904.0933	4200684.394	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539902.7621	4200678.544	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539901.431	4200672.693	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC2	539900.2681	4200666.807	0.016129	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539566.2613	4200457.069	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539572.2611	4200457.116	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539578.261	4200457.163	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539584.2608	4200457.21	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539590.2606	4200457.256	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539596.2604	4200457.303	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539602.2602	4200457.35	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539607.207	4200458.422	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539607.0938	4200464.421	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539606.9805	4200470.42	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539606.8673	4200476.419	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539606.754	4200482.418	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539608.1962	4200486.867	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539614.1955	4200486.775	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539620.1948	4200486.684	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539626.1942	4200486.593	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539632.1935	4200486.501	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539638.1928	4200486.41	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539644.1921	4200486.318	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539650.1914	4200486.227	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539656.1907	4200486.136	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539662.19	4200486.044	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539668.1893	4200485.953	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539674.1886	4200485.862	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539680.1879	4200485.77	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539686.1872	4200485.679	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539692.1865	4200485.587	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539698.1025	4200484.989	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539703.815	4200483.154	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539709.5275	4200481.319	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539715.24	4200479.484	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539720.9525	4200477.649	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539726.6651	4200475.814	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539732.3776	4200473.979	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539738.1747	4200472.74	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539744.1722	4200472.913	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539750.1697	4200473.085	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539756.1673	4200473.257	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539762.1648	4200473.43	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539768.1623	4200473.602	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539774.1598	4200473.775	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539780.1574	4200473.947	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539786.1549	4200474.12	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539792.1524	4200474.292	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539798.1499	4200474.464	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539804.1474	4200474.637	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539810.145	4200474.809	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539816.1425	4200474.982	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539822.14	4200475.154	0.014706	3.048	2.79069767	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Lower Channel	VOLUME	LC3	539828.1375	4200475.326	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539834.1351	4200475.499	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539840.1326	4200475.671	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539846.1301	4200475.844	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539852.1276	4200476.016	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539858.1252	4200476.188	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539864.1227	4200476.361	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539870.1202	4200476.533	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539876.1177	4200476.706	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539882.1152	4200476.878	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539882.5182	4200481.557	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539881.4093	4200487.453	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539880.3004	4200493.35	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539879.1915	4200499.247	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539878.0826	4200505.143	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539876.9737	4200511.04	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539875.8647	4200516.937	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539874.7558	4200522.833	0.014706	3.048	2.79069767	3.2
Lower Channel	VOLUME	LC3	539873.6469	4200528.73	0.014706	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539380.5225	4200998.78	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539384.8583	4201002.927	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539388.9405	4201007.288	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539392.2797	4201012.273	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539395.6189	4201017.258	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539398.9581	4201022.243	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539402.2973	4201027.228	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539405.6365	4201032.213	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539408.9758	4201037.198	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539412.315	4201042.182	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539415.6542	4201047.167	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539418.9934	4201052.152	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539422.3326	4201057.137	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539425.6718	4201062.122	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539429.011	4201067.107	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539432.3502	4201072.092	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539435.6894	4201077.077	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539439.0286	4201082.062	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539442.3679	4201087.047	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539445.7071	4201092.032	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539449.0463	4201097.017	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539452.3855	4201102.002	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539455.7247	4201106.987	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539459.0639	4201111.972	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539462.4031	4201116.957	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539465.7423	4201121.942	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539469.0815	4201126.927	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539472.4208	4201131.911	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539475.76	4201136.896	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539479.0992	4201141.881	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539482.8013	4201146.598	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539486.5858	4201151.254	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539490.3702	4201155.91	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539494.1547	4201160.566	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539497.9391	4201165.222	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539501.7236	4201169.878	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539505.508	4201174.534	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539509.2925	4201179.19	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539513.0769	4201183.846	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539516.8614	4201188.502	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539520.6434	4201193.16	0.023810	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA1	539524.4246	4201197.818	0.023810	3.048	2.79069767	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Graton Work Area	VOLUME	GWA2	539483.2737	4201156.284	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539478.752	4201160.227	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539474.2303	4201164.171	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539469.7086	4201168.115	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539465.1869	4201172.059	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539460.6652	4201176.003	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539456.1435	4201179.947	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539450.2847	4201180.556	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539444.2909	4201180.829	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539438.2971	4201181.101	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539432.3033	4201181.374	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539426.3095	4201181.646	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539420.3157	4201181.919	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539414.3219	4201182.191	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539408.3281	4201182.464	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539402.3343	4201182.737	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539396.3404	4201183.009	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539390.3466	4201183.282	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539384.3528	4201183.554	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539378.359	4201183.827	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539372.3652	4201184.099	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539366.3714	4201184.372	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539360.3776	4201184.644	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539354.3838	4201184.917	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539348.39	4201185.19	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539342.3962	4201185.462	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539336.4024	4201185.735	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539330.5777	4201186.638	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539325.2509	4201189.4	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539319.924	4201192.161	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539314.5972	4201194.922	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539309.2704	4201197.684	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA2	539305.0115	4201199.891	0.030303	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539318.8357	4201189.378	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539322.0959	4201184.341	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539325.356	4201179.304	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539328.6162	4201174.267	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539331.8763	4201169.23	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539335.1365	4201164.193	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539338.3966	4201159.156	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539341.6568	4201154.119	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539344.9169	4201149.082	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539348.1771	4201144.045	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539351.4372	4201139.008	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539354.6974	4201133.971	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539357.9575	4201128.934	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539361.2176	4201123.897	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539364.4778	4201118.86	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539367.7379	4201113.823	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539370.9981	4201108.786	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539374.2582	4201103.749	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539377.5184	4201098.712	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539380.7785	4201093.675	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539384.0387	4201088.638	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539387.2988	4201083.601	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539390.559	4201078.564	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539393.8191	4201073.527	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539397.0792	4201068.49	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539400.3394	4201063.453	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539403.5995	4201058.416	0.034483	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA3	539406.8597	4201053.379	0.034483	3.048	2.79069767	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Graton Work Area	VOLUME	GWA3	539410.1198	4201048.342	0.034483	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538906.6517	4201717.419	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538912.3649	4201719.252	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538918.0782	4201721.085	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538923.7914	4201722.918	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538929.5046	4201724.75	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538935.2178	4201726.583	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538940.9311	4201728.416	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538946.6443	4201730.249	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538952.3575	4201732.082	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538958.0707	4201733.914	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538963.7839	4201735.747	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538969.4972	4201737.58	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538975.2104	4201739.413	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538980.9236	4201741.245	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538986.6368	4201743.078	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538992.35	4201744.911	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	538998.0633	4201746.744	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	539003.7661	4201748.607	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	539009.408	4201750.649	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP2	539015.0498	4201752.691	0.050000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	539042.8055	4201578.85	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	539037.4836	4201576.237	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	539031.5663	4201576.485	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	539026.446	4201579.495	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	539021.9429	4201583.46	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	539017.4398	4201587.425	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	539012.9367	4201591.39	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	539008.4335	4201595.356	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	539003.9304	4201599.321	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538999.4273	4201603.286	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538994.8795	4201607.199	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538990.3205	4201611.1	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538985.7615	4201615.001	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538981.2025	4201618.901	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538976.6435	4201622.802	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538972.0845	4201626.703	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538967.5591	4201630.642	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538963.0724	4201634.626	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538958.6071	4201638.632	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538954.3288	4201642.839	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538950.0506	4201647.046	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538945.9347	4201651.409	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538941.8759	4201655.828	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538937.904	4201660.323	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538934.0752	4201664.943	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538930.2555	4201669.569	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538927.0317	4201674.629	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538923.8078	4201679.689	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538920.584	4201684.75	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538917.3602	4201689.81	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538914.1363	4201694.87	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538910.9125	4201699.931	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538907.6887	4201704.991	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538904.4648	4201710.051	0.028571	3.048	2.79069767	3.2
Allen Park	VOLUME	AP1	538900.9385	4201715.587	0.028571	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA5	539299.9483	4201196.672	0.250000	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA5	539294.885	4201193.453	0.250000	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA5	539289.8217	4201190.234	0.250000	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA5	539284.7584	4201187.015	0.250000	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539274.7214	4201212.675	0.018519	3.048	2.79069767	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Graton Work Area	VOLUME	GWA4	539275.651	4201206.749	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539276.7813	4201200.859	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539278.2002	4201195.029	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539280.0019	4201189.309	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539282.1214	4201183.696	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539284.4655	4201178.175	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539287.0049	4201172.738	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539289.4475	4201167.259	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539291.7377	4201161.713	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539294.0115	4201156.161	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539296.2481	4201150.593	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539298.4287	4201145.004	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539300.6093	4201139.414	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539302.7182	4201133.797	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539304.8036	4201128.171	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539306.9491	4201122.568	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539309.1048	4201116.968	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539311.4059	4201111.428	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539313.7477	4201105.904	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539316.0896	4201100.379	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539318.4587	4201094.867	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539320.9412	4201089.405	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539323.4582	4201083.959	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539326.0505	4201078.548	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539328.6633	4201073.147	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539331.3478	4201067.781	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539334.0632	4201062.43	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539336.8383	4201057.111	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539339.712	4201051.844	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539342.6344	4201046.604	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539345.5804	4201041.378	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539348.645	4201036.219	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539351.7096	4201031.061	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539354.8735	4201025.964	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539358.088	4201020.897	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539361.3236	4201015.845	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539364.6713	4201010.866	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539368.019	4201005.886	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539371.5025	4201001.003	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539375.057	4200996.169	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539378.6316	4200991.35	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539382.316	4200986.615	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539386.0004	4200981.879	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539389.7807	4200977.221	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539393.6125	4200972.604	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539397.5551	4200968.082	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539401.5297	4200963.587	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539405.5042	4200959.092	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539409.5205	4200954.635	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539413.5606	4200950.199	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539417.6008	4200945.763	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539421.641	4200941.327	0.018519	3.048	2.79069767	3.2
Graton Work Area	VOLUME	GWA4	539425.6811	4200936.891	0.018519	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538932.0821	4201719.747	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538935.9453	4201715.156	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538939.8085	4201710.565	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538943.6717	4201705.975	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538947.5348	4201701.384	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538951.398	4201696.793	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538955.2612	4201692.202	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538959.1244	4201687.611	0.032258	3.048	2.79069767	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Allen Park	VOLUME	AP3	538962.9876	4201683.02	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538966.8508	4201678.43	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538970.714	4201673.839	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538974.5772	4201669.248	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538978.4404	4201664.657	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538982.3035	4201660.066	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538986.1667	4201655.475	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538990.0299	4201650.885	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538993.8931	4201646.294	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	538997.7563	4201641.703	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539001.6195	4201637.112	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539005.4827	4201632.521	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539009.3459	4201627.93	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539013.209	4201623.34	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539017.0722	4201618.749	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539020.9354	4201614.158	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539024.7986	4201609.567	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539028.6618	4201604.976	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539032.525	4201600.385	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539036.3882	4201595.795	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539040.2514	4201591.204	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539044.1146	4201586.613	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP3	539047.3838	4201582.728	0.032258	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539071.0426	4201583.382	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539075.4066	4201579.264	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539079.7705	4201575.147	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539084.1344	4201571.029	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539088.4984	4201566.911	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539092.8623	4201562.793	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539097.2262	4201558.676	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539101.5902	4201554.558	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539105.9542	4201550.44	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539110.3181	4201546.322	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539114.6821	4201542.205	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539119.046	4201538.087	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539123.4099	4201533.969	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539127.7739	4201529.851	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539132.1378	4201525.733	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539136.5018	4201521.616	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539140.8657	4201517.498	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539145.2297	4201513.38	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539149.5936	4201509.262	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539153.9575	4201505.145	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539158.9052	4201501.956	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539164.5087	4201499.811	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539170.1122	4201497.666	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539175.5696	4201495.31	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539179.5559	4201490.825	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539183.5422	4201486.341	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539187.5286	4201481.857	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539191.5149	4201477.372	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539195.5013	4201472.888	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539196.4089	4201467.056	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539198.9753	4201461.779	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539202.2499	4201456.751	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539205.5246	4201451.724	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539208.7992	4201446.696	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539212.0738	4201441.669	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP6	539215.3484	4201436.641	0.027778	3.048	2.79069767	3.2
Allen Park	VOLUME	AP4	539113.5443	4201581.391	0.200000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP4	539109.3132	4201577.137	0.200000	3.048	2.79069767	3.2

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Allen Park	VOLUME	AP4	539105.082	4201572.883	0.200000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP4	539100.8509	4201568.628	0.200000	3.048	2.79069767	3.2
Allen Park	VOLUME	AP4	539096.6197	4201564.374	0.200000	3.048	2.79069767	3.2
Allen Park Riparian Corridor	VOLUME	APRC001	539046.8504	4201589.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC002	539056.8504	4201579.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC003	539056.8504	4201589.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC004	539056.8504	4201599.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC005	539066.8504	4201549.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC006	539066.8504	4201559.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC007	539066.8504	4201569.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC008	539066.8504	4201579.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC009	539066.8504	4201589.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC010	539076.8504	4201539.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC011	539076.8504	4201549.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC012	539076.8504	4201559.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC013	539076.8504	4201569.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC014	539076.8504	4201579.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC015	539086.8504	4201529.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC016	539086.8504	4201539.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC017	539086.8504	4201549.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC018	539086.8504	4201559.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC019	539086.8504	4201569.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC020	539096.8504	4201509.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC021	539096.8504	4201519.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC022	539096.8504	4201529.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC023	539096.8504	4201539.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC024	539096.8504	4201549.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC025	539096.8504	4201559.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC026	539106.8504	4201499.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC027	539106.8504	4201509.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC028	539106.8504	4201519.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC029	539106.8504	4201529.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC030	539106.8504	4201539.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC031	539106.8504	4201549.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC032	539116.8504	4201489.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC033	539116.8504	4201499.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC034	539116.8504	4201509.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC035	539116.8504	4201519.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC036	539116.8504	4201529.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC037	539116.8504	4201539.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC038	539126.8504	4201479.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC039	539126.8504	4201489.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC040	539126.8504	4201499.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC041	539126.8504	4201509.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC042	539126.8504	4201519.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC043	539126.8504	4201529.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC044	539136.8504	4201469.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC045	539136.8504	4201479.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC046	539136.8504	4201489.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC047	539136.8504	4201499.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC048	539136.8504	4201509.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC049	539136.8504	4201519.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC050	539146.8504	4201459.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC051	539146.8504	4201469.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC052	539146.8504	4201479.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC053	539146.8504	4201489.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC054	539146.8504	4201499.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC055	539146.8504	4201509.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC056	539156.8504	4201449.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC057	539156.8504	4201459.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC058	539156.8504	4201469.082	0.012195122	5	4.65116279	1.4

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Allen Park Riparian Corridor	VOLUME	APRC059	539156.8504	4201479.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC060	539156.8504	4201489.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC061	539156.8504	4201499.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC062	539166.8504	4201449.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC063	539166.8504	4201459.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC064	539166.8504	4201469.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC065	539166.8504	4201479.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC066	539166.8504	4201489.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC067	539176.8504	4201449.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC068	539176.8504	4201459.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC069	539176.8504	4201469.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC070	539176.8504	4201479.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC071	539186.8504	4201449.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC072	539186.8504	4201459.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC073	539186.8504	4201469.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC074	539196.8504	4201439.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC075	539196.8504	4201449.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC076	539206.8504	4201429.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC077	539206.8504	4201439.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC078	539216.8504	4201419.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC079	539216.8504	4201429.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC080	539226.8504	4201399.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC081	539226.8504	4201409.082	0.012195122	5	4.65116279	1.4
Allen Park Riparian Corridor	VOLUME	APRC082	539226.8504	4201419.082	0.012195122	5	4.65116279	1.4
Channel Access Ramp	VOLUME	CAR	539286.8504	4201189.082	0.012195122	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG001	538926.8504	4201749.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG002	538936.8504	4201739.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG003	538936.8504	4201749.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG004	538946.8504	4201739.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG005	538956.8504	4201709.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG006	538956.8504	4201719.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG007	538966.8504	4201699.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG008	538966.8504	4201709.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG009	538966.8504	4201719.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG010	538976.8504	4201679.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG011	538976.8504	4201689.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG012	538976.8504	4201699.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG013	538976.8504	4201709.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG014	538986.8504	4201669.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG015	538986.8504	4201679.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG016	538986.8504	4201689.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG017	538986.8504	4201699.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG018	538996.8504	4201659.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG019	538996.8504	4201669.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG020	538996.8504	4201679.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG021	538996.8504	4201689.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG022	539006.8504	4201649.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG023	539006.8504	4201659.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG024	539006.8504	4201669.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG025	539016.8504	4201629.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG026	539016.8504	4201639.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG027	539016.8504	4201649.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG028	539026.8504	4201619.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG029	539026.8504	4201629.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG030	539036.8504	4201609.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG031	539036.8504	4201619.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG032	539046.8504	4201599.082	0.03030303	5	4.65116279	1.4
Fish Passage Transitional Grading	VOLUME	FPTG033	539046.8504	4201609.082	0.03030303	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR001	539866.8504	4200619.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR002	539876.8504	4200539.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR003	539876.8504	4200549.082	0.016949153	5	4.65116279	1.4

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Low Channel Concrete Removal	VOLUME	LCCR004	539876.8504	4200559.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR005	539876.8504	4200569.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR006	539876.8504	4200579.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR007	539876.8504	4200589.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR008	539876.8504	4200599.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR009	539876.8504	4200609.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR010	539876.8504	4200619.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR011	539876.8504	4200629.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR012	539876.8504	4200639.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR013	539886.8504	4200509.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR014	539886.8504	4200519.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR015	539886.8504	4200529.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR016	539886.8504	4200539.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR017	539886.8504	4200549.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR018	539886.8504	4200559.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR019	539886.8504	4200569.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR020	539886.8504	4200579.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR021	539886.8504	4200589.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR022	539886.8504	4200599.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR023	539886.8504	4200609.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR024	539886.8504	4200619.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR025	539886.8504	4200629.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR026	539886.8504	4200639.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR027	539886.8504	4200649.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR028	539886.8504	4200659.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR029	539896.8504	4200509.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR030	539896.8504	4200519.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR031	539896.8504	4200529.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR032	539896.8504	4200539.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR033	539896.8504	4200549.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR034	539896.8504	4200559.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR035	539896.8504	4200569.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR036	539896.8504	4200579.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR037	539896.8504	4200589.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR038	539896.8504	4200599.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR039	539896.8504	4200659.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR040	539906.8504	4200519.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR041	539906.8504	4200529.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR042	539906.8504	4200539.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR043	539906.8504	4200549.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR044	539906.8504	4200559.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR045	539906.8504	4200569.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR046	539906.8504	4200579.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR047	539916.8504	4200519.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR048	539916.8504	4200529.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR049	539916.8504	4200539.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR050	539916.8504	4200549.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR051	539916.8504	4200559.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR052	539926.8504	4200519.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR053	539926.8504	4200529.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR054	539926.8504	4200539.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR055	539926.8504	4200549.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR056	539936.8504	4200519.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR057	539936.8504	4200529.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR058	539936.8504	4200539.082	0.016949153	5	4.65116279	1.4
Low Channel Concrete Removal	VOLUME	LCCR059	539946.8504	4200529.082	0.016949153	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP001	539236.8504	4201389.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP002	539236.8504	4201399.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP003	539246.8504	4201379.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP004	539256.8504	4201369.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP005	539266.8504	4201199.082	0.019230769	5	4.65116279	1.4

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
New Fish Pools	VOLUME	NFP006	539266.8504	4201209.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP007	539266.8504	4201219.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP008	539266.8504	4201229.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP009	539266.8504	4201349.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP010	539266.8504	4201359.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP011	539276.8504	4201169.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP012	539276.8504	4201179.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP013	539276.8504	4201189.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP014	539276.8504	4201239.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP015	539276.8504	4201249.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP016	539276.8504	4201259.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP017	539276.8504	4201329.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP018	539276.8504	4201339.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP019	539286.8504	4201149.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP020	539286.8504	4201159.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP021	539286.8504	4201269.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP022	539286.8504	4201279.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP023	539286.8504	4201289.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP024	539286.8504	4201299.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP025	539286.8504	4201309.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP026	539286.8504	4201319.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP027	539286.8504	4201329.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP028	539296.8504	4201119.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP029	539296.8504	4201129.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP030	539296.8504	4201139.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP031	539306.8504	4201099.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP032	539306.8504	4201109.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP033	539316.8504	4201079.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP034	539316.8504	4201089.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP035	539326.8504	4201059.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP036	539326.8504	4201069.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP037	539336.8504	4201039.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP038	539336.8504	4201049.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP039	539346.8504	4201019.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP040	539346.8504	4201029.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP041	539356.8504	4201009.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP042	539356.8504	4201019.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP043	539366.8504	4200989.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP044	539366.8504	4200999.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP045	539376.8504	4200979.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP046	539376.8504	4200989.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP047	539386.8504	4200969.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP048	539396.8504	4200959.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP049	539406.8504	4200949.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP050	539416.8504	4200929.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP051	539416.8504	4200939.082	0.019230769	5	4.65116279	1.4
New Fish Pools	VOLUME	NFP052	539426.8504	4200929.082	0.019230769	5	4.65116279	1.4
Flood Wall 2	VOLUME	FW201	539626.8504	4200839.083	0.125	5	4.65116279	1.4
Flood Wall 2	VOLUME	FW202	539626.8504	4200849.083	0.125	5	4.65116279	1.4
Flood Wall 2	VOLUME	FW203	539636.8504	4200839.083	0.125	5	4.65116279	1.4
Flood Wall 2	VOLUME	FW204	539636.8504	4200849.083	0.125	5	4.65116279	1.4
Flood Wall 2	VOLUME	FW205	539636.8504	4200859.083	0.125	5	4.65116279	1.4
Flood Wall 2	VOLUME	FW206	539646.8504	4200839.083	0.125	5	4.65116279	1.4
Flood Wall 2	VOLUME	FW207	539646.8504	4200849.083	0.125	5	4.65116279	1.4
Flood Wall 2	VOLUME	FW208	539656.8504	4200849.083	0.125	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW101	539676.8504	4200829.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW102	539676.8504	4200839.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW103	539686.8504	4200819.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW104	539686.8504	4200829.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW105	539696.8504	4200819.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW106	539696.8504	4200829.083	0.02173913	5	4.65116279	1.4

Table 7: Source Location and Parameters

Source Description	Source Type	SrcID	UTM X (m)	UTM Y (m)	Unit Rate	Release Height (M)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Flood Wall 1	VOLUME	FW107	539706.8504	4200819.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW108	539716.8504	4200809.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW109	539716.8504	4200819.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW110	539726.8504	4200809.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW111	539726.8504	4200819.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW112	539736.8504	4200809.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW113	539746.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW114	539746.8504	4200809.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW115	539756.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW116	539756.8504	4200809.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW117	539766.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW118	539776.8504	4200789.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW119	539776.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW120	539786.8504	4200789.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW121	539786.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW122	539796.8504	4200789.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW123	539796.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW124	539806.8504	4200789.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW125	539806.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW126	539816.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW127	539826.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW128	539836.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW129	539846.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW130	539856.8504	4200789.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW131	539856.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW132	539866.8504	4200789.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW133	539866.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW134	539876.8504	4200789.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW135	539876.8504	4200799.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW136	539886.8504	4200779.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW137	539886.8504	4200789.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW138	539896.8504	4200769.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW139	539896.8504	4200779.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW140	539896.8504	4200789.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW141	539906.8504	4200739.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW142	539906.8504	4200749.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW143	539906.8504	4200759.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW144	539906.8504	4200769.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW145	539906.8504	4200779.083	0.02173913	5	4.65116279	1.4
Flood Wall 1	VOLUME	FW146	539916.8504	4200739.083	0.02173913	5	4.65116279	1.4

Table 8: Exposure Factors

Population	Age bin	ED (yr)	DBR	EF	CF	FAH	ASF	AT	OEHHA Basis
Operational Phase									
Residential	3rd trimester	0.25	361	0.95890411	0.000001	1	10	70	95/80thDBR_30yr
Residential	0-2	2	1090	0.95890411	0.000001	1	10	70	95/80thDBR_30yr
Residential	2-16	14	572	0.95890411	0.000001	1	3	70	95/80thDBR_30yr
Residential	16-30	13.75	261	0.95890411	0.000001	1	1	70	95/80thDBR_30yr
Construction Phase									
Residential	3rd trimester	0.25	361	1	0.000001	1	10	70	95/80thDBR_30yr
Residential	0-2	0.42	1090	1	0.000001	1	10	70	95/80thDBR_30yr

1. A = absorption; ASF = age sensitivity factor; AT = averaging time; CF = conversion factor; DBR = daily breathing rate; ED = exposure duration; EF = exposure frequency; TAF = time adjustment factor.
2. It was assumed that the emergency generator is tested outside of normal school hours so schools and day-care children are not exposed to these emissions.
3. Exposure Frequency (EF) was assumed to be 350 days per year.
4. Residential exposure was assumed to be 30 years with a continuously aging child from third trimester onward from construction through operation.
5. Averaging time is based on a 70-year lifetime cancer risk.

Table 9: Toxicity Factors

Chemical	Cancer Potency Factor	Chronic REL	Acute REL
1,3-Butadiene	0.6	2	660
Acetaldehyde	0.01	140	470
Benzene	0.1	3	27
Diesel Particulate Matter	1.1	5	
Ethylbenzene	0.0087	2000	
Formaldehyde	0.021	9	55
Hexane		7000	
Methanol		4000	28000
Methyl Ethyl Ketone			13000
Naphthalene	0.12	9	
Propylene		3000	
Styrene		900	21000
Toluene		420	5000
Xylenes		700	22000

Table 10: Health Risk Assessment Results at MEIR

UTM X (m)	UTM Y (m)	Notes	Cancer Risk in a Million		Chronic HI		Acute HI		Mitigated PM 2.5 Concentration (ug/m^3)	
			Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Construction										
538933.7	4201716	Note 1	16.54	4.42	0.039	0.010			0.12	0.033
538908.7	4201766	Note 2	11.90	3.17	0.028	0.0074	59			
539108.7	4201566	Note 1						0.61		
Operation										
539483.7	4201016	Note 3	0.76	0.76	0.00020	0.00020	0.066	0.066	0.0010	0.0010

1. This represents the maximum of a receptor modeled using residential exposure assumptions.
2. This is the maximum at an actual residence. For the unmitigated acute HI the maximum of any receptor is the same as the maximum residential location.
3. This is the maximum of a receptor modeled using residential exposure assumptions since a person could be around for all Emergency Generator testing.

Table 11: BAAQMD Permitted Sources

Name	Address	City	Cancer	Hazard	PM 2.5	Type	Latitude	Longitude	Distance to MEIR (m)		
									Cancer/Chronic	Acute	Operational
Marin General Hospital	250 Bonair Road	Greenbrae	74.6	0.13	0.54	Other	37.946	-122.535	2628	2415	1753
Sanitary District No 1 Kentfield Pump Station	Corte Madera Creek Pathway	Kentfield	19.05	0.01	0.02	Generators	37.951	-122.547	1513	1312	626
Northern California Presbyterian Homes & Services	501 Via Casitas	Greenbrae	3.44	0.02	1.08	Other	37.946	-122.532	2826	2611	1965
32 Shady Lane Residence	32 Shady Lane	Ross	0	0	0	Generators	37.964	-122.559	278	491	1167
Woodlands Gas & Mart	1 Kent Ave	Kentfield	80.91	0.36	0	Gas Dispensing Facility	37.951	-122.55	1381	1196	545

Source

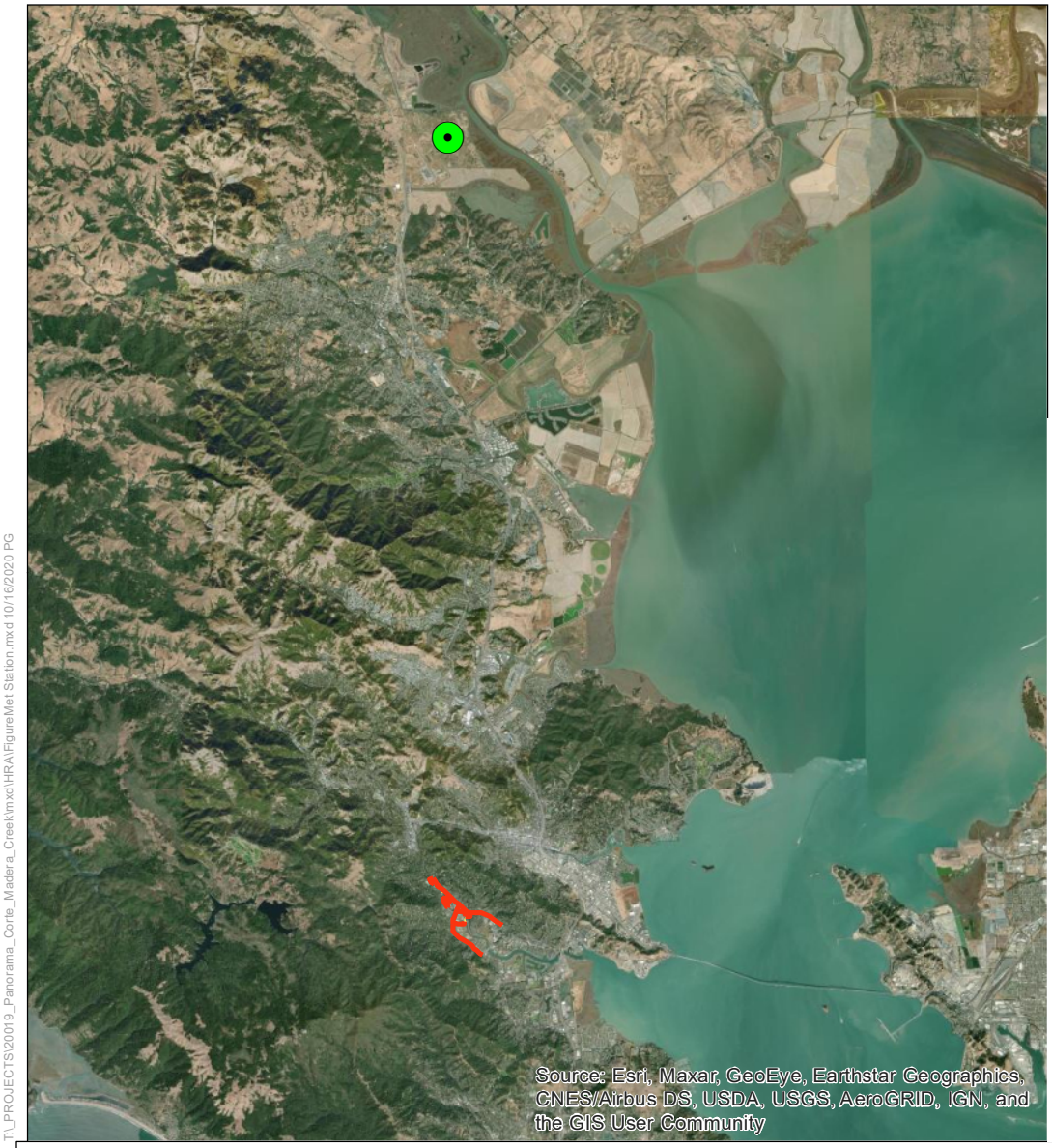
Bay Area Air Quality Management District. 2020. Permitted Sources Risk and Hazards Map.
Available online at: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65.

Table 12: Estimate of Cumulative Risk

Name	Cancer	Hazard	PM 2.5	Distance to MEIR (m)			Adjusted Value at MEIR		
				Cancer/Chro	Acute	Operational	Cancer	Hazard	PM 2.5
Marin General Hospital	74.6	0.13	0.54	2628	2415	1753	9.83	0.017	0.071
Sanitary District No 1 Kentfield Pump Station	19.05	0.01	0.02	1513	1312	626	0.76	0.0004	0.022
Northern California Presbyterian Homes & Services	3.44	0.02	1.08	2826	2611	1965	0.45	0.0026	0.14
32 Shady Lane Residence	0	0	0	278	491	1167	0.76	0.0004	0.022
Woodlands Gas & Mart	80.91	0.36	0	1381	1196	545	1.21	0.0054	0
Mitigated Project Construction	4.42	0.0100	0.033				4.42	0.0100	0.0065
Total Construction Cumulative							**17.43**	**0.04**	**0.26**
Mitigated Project Operation	0.76	0.0002	0.066				0.76	0.0002	0.066
Total Operational Cumulative							**13.77**	**0.026**	**0.321**

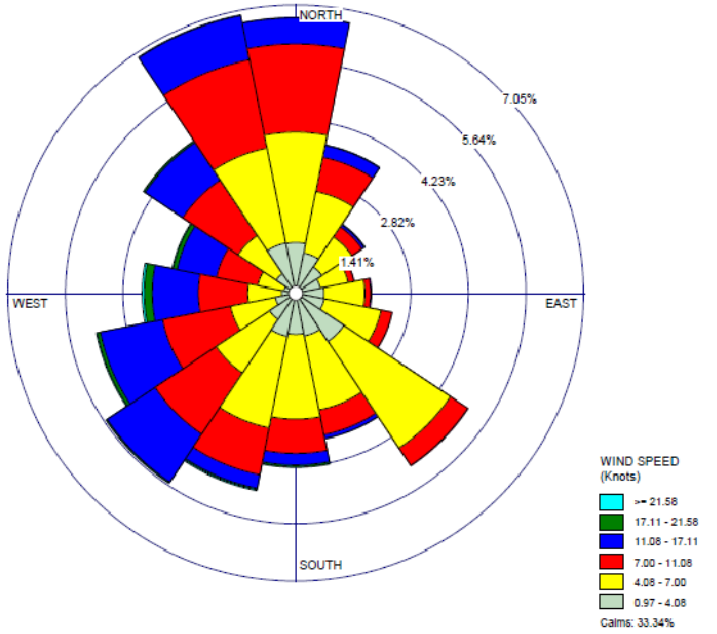
Notes
1. The Distance Multiplier Tool only went to 280 meters for generators, 300 meters for gas stations, and 300 meters for other sources so these were used for the values if distance was greater than this.
2. To be conservative similar Cancer, Hazard and PM 2.5 emissions were used for the generator at 32 Shady Lane Residence as the Sanitary District N0 1 Kentfield Pump Station.

Source
BAAQMD Health Risk Calculator Distance Multiplier



Legend

- Gnoss Airport
- Roads
- Project Work Areas



T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRA\FigureMet Station.mxd 10/16/2020 PG

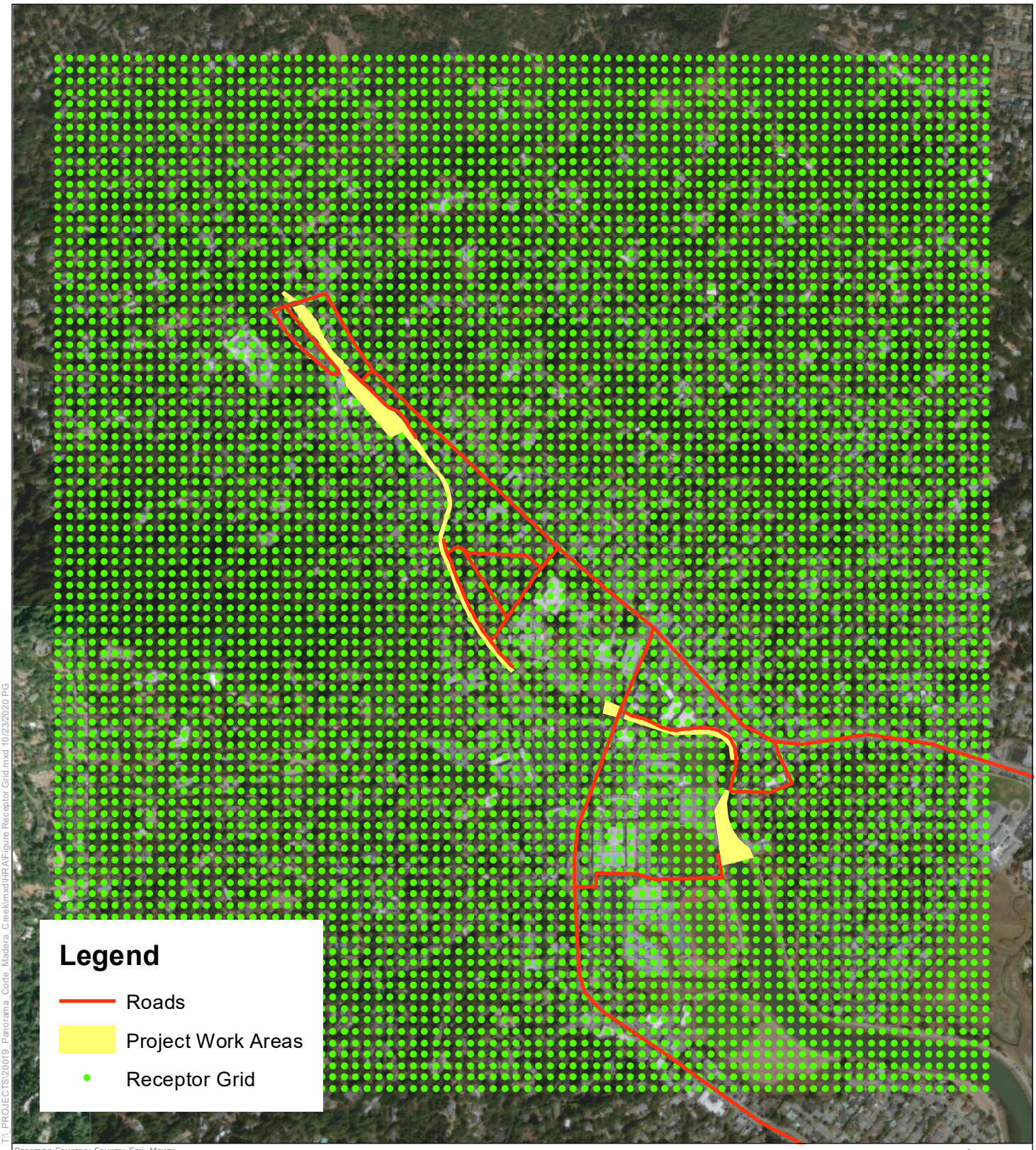
N

0 2.5 5 10 15 20 Miles

Horizon WATER and ENVIRONMENT

Figure 1
Location and Windrose
Gnoss Airport
Health Risk Assessment

Corte Madera Creek Flood Risk Managemnt Project Phase 1



T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRAFigure Receptor Grid.mxd 10/23/2020 PG

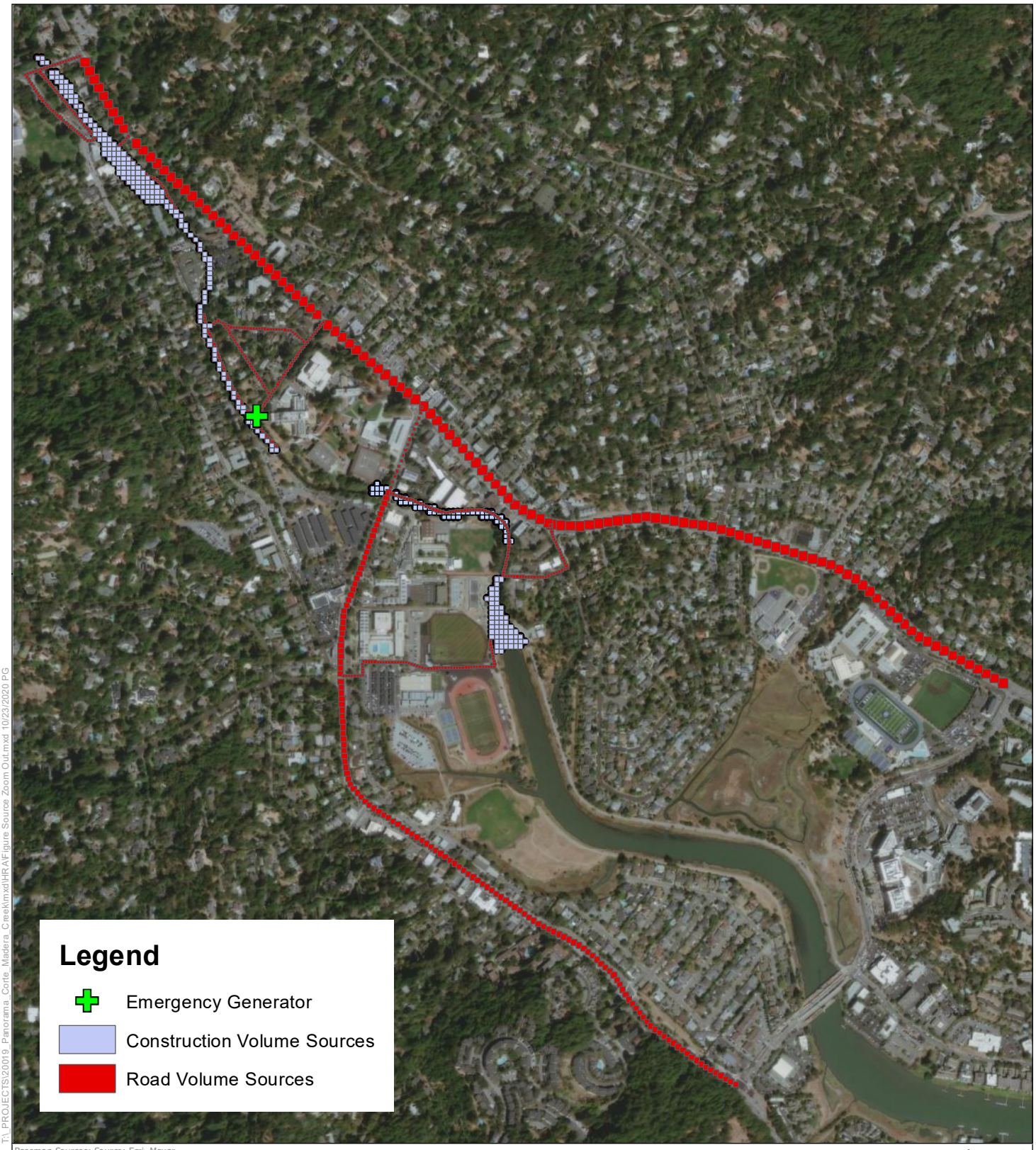
Basemap Sources: Source: Esri, Maxar, GeoEye, Earthstar Geographics,

N

0 145 290 580 870 1,160
Meters

Figure 2
Receptor Grid
Health Risk Assessment

Horizon WATER and ENVIRONMENT



T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRAFigure Source Zoom Out.mxd 10/23/2020 PG

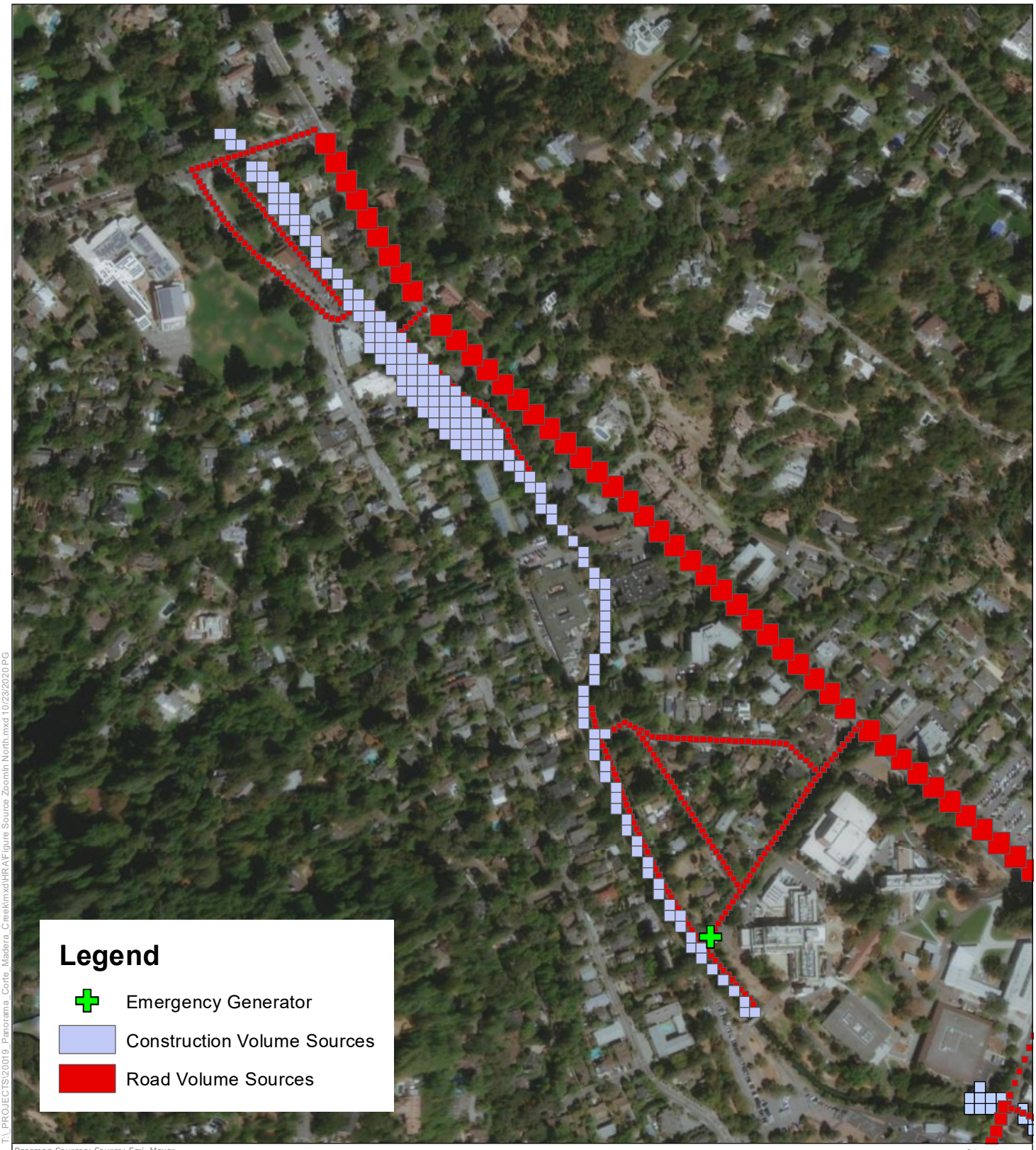
Basemap Sources: Source: Esri, Maxar, GeoEye, Earthstar Geographics,

N

0 140 280 560 840 1,120
Meters

Figure 3
Model Sources
Health Risk Assessment

Horizon WATER and ENVIRONMENT



T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRAFigure Source Zoomin North.mxd 10/23/2020 PG

Basemap Sources: Source: Esri, Maxar, GeoEye, Earthstar Geographics,

N

0 62.5 125 250 375 500 Meters

Figure 4
Model Sources Northern End Zoom In
Health Risk Assessment

Horizon WATER and ENVIRONMENT

T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRAFigure Source Zoomin South.mxd 10/23/2020 PG

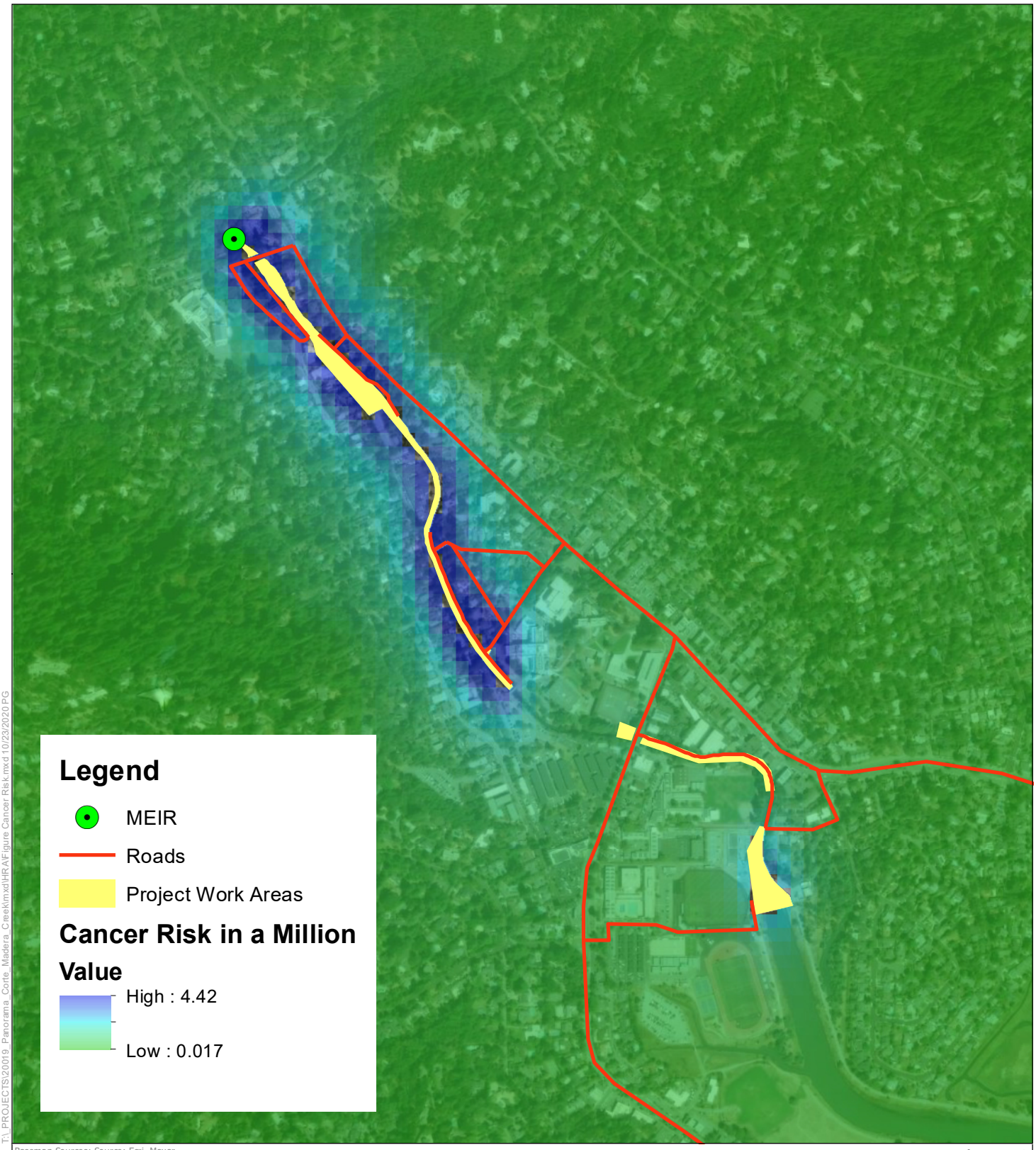
Basemap Sources: Source: Esri, Maxar, GeoEye, Earthstar Geographics,

Figure 5
Model Sources Southern End Zoom In
Health Risk Assessment

N

0 65 130 260 390 520
Meters

Horizon WATER and ENVIRONMENT



T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRAFigure Cancer Risk.mxd 10/23/2020 PG

Basemap Sources: Source: Esri, Maxar, GeoEye, Earthstar Geographics,

Figure 6
Construction Residential Cancer Risk
Health Risk Assessment

N

0 125 250 500 750 1,000
Meters

Horizon WATER and ENVIRONMENT

T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRAFigure Construction HI.mxd 10/29/2020 PG

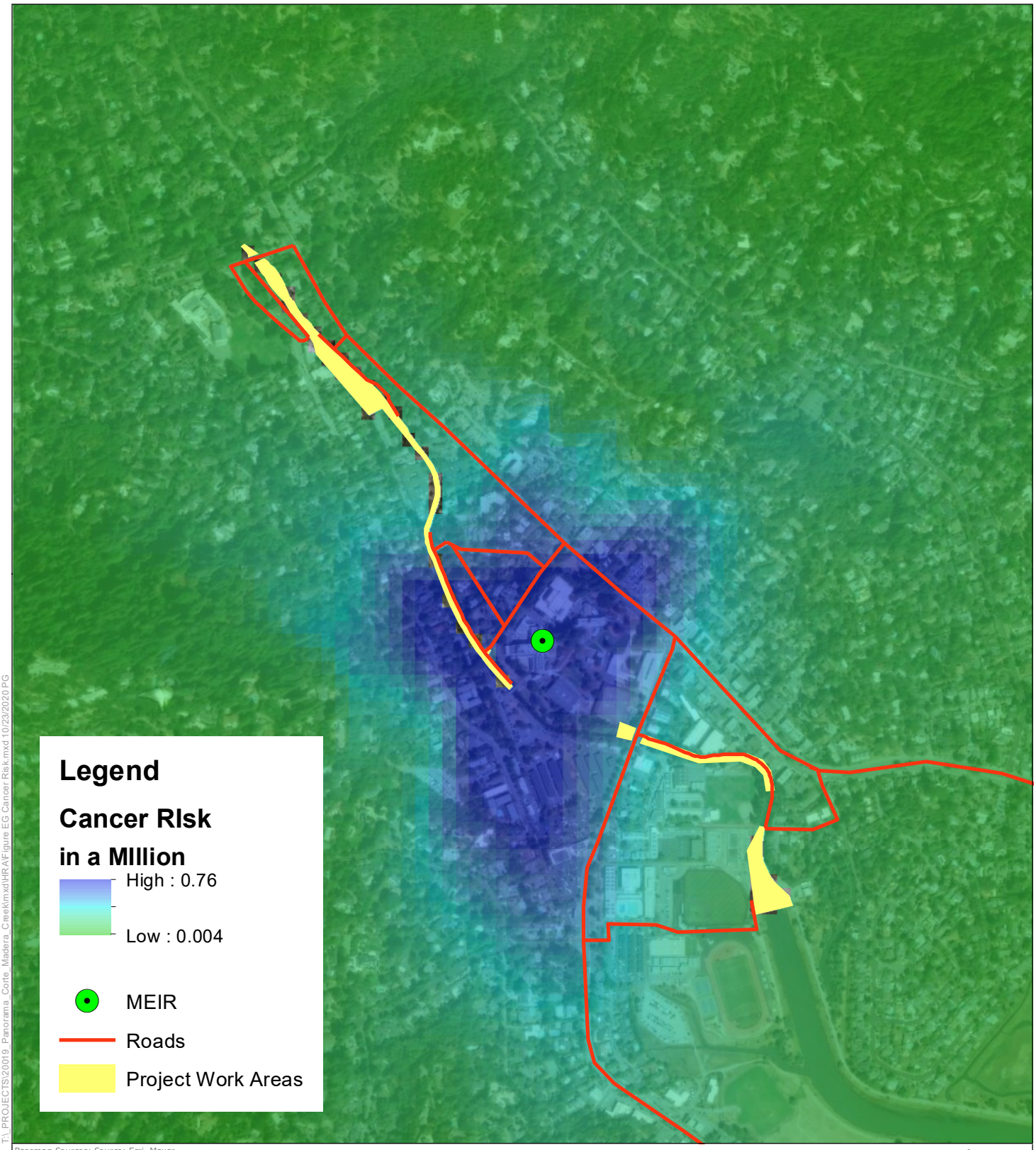
Basemap Sources: Source: Esri, Maxar, GeoEye, Earthstar Geographics,

N

0 125 250 500 750 1,000 Meters

Figure 7
Construction Chronic and Acute HI
Health Risk Assessment

Horizon WATER and ENVIRONMENT



T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRAFigure EG Cancer Risk.mxd 10/23/2020 PG

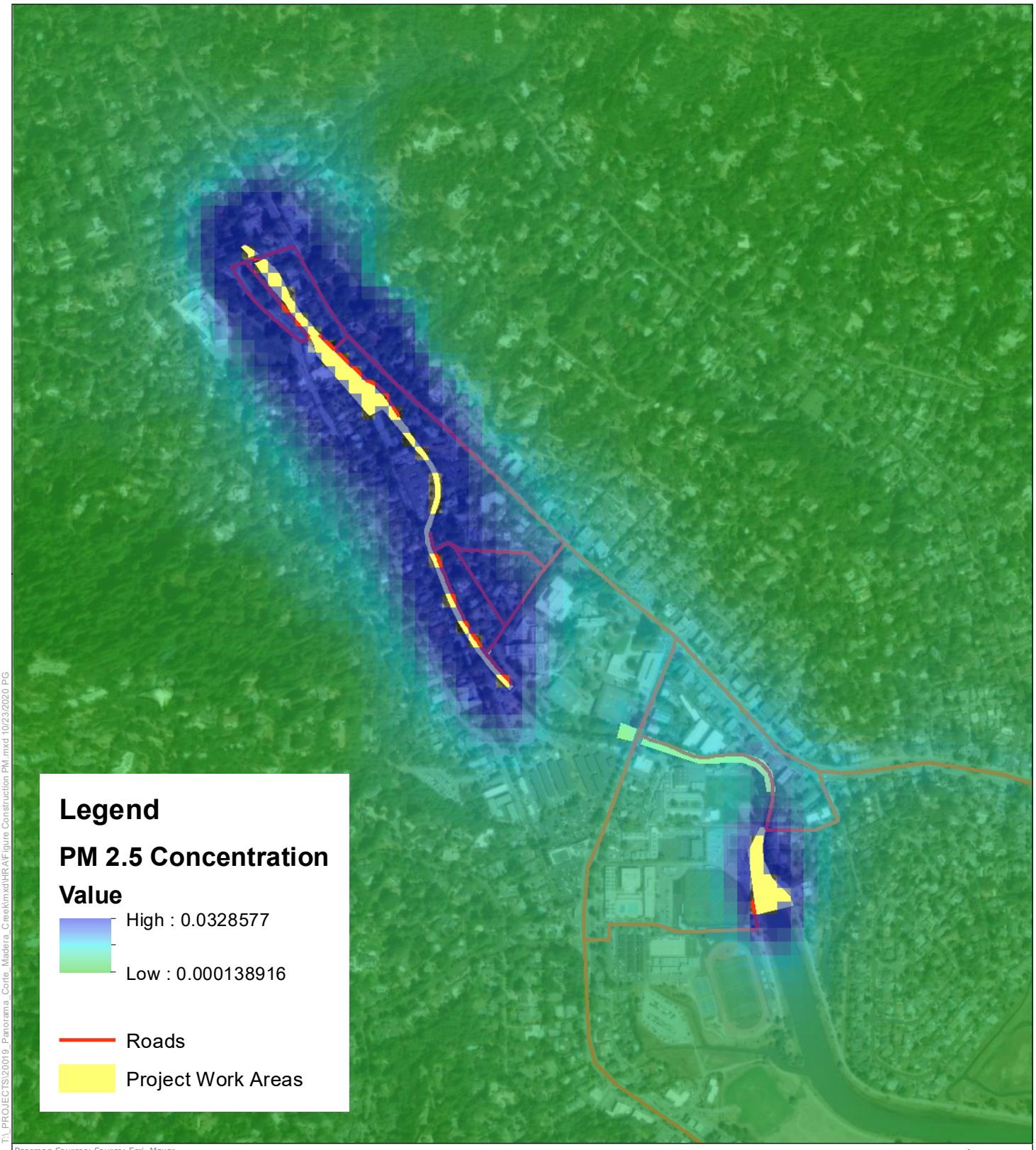
Basemap Sources: Source: Esri, Maxar, GeoEye, Earthstar Geographics,

Figure 8
Emergency Generator Cancer Risk
Health Risk Assessment

N

0 125 250 500 750 1,000
Meters

Horizon WATER and ENVIRONMENT



T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRAFigure Construction PM.mxd 10/23/2020 PG

Basemap Sources: Source: Esri, Maxar, GeoEye, Earthstar Geographics,

N

0 125 250 500 750 1,000 Meters

Figure 9
Construction PM 2.5 Concentration
Health Risk Assessment

Horizon WATER and ENVIRONMENT

T:_PROJECTS\20019_Panorama_Corte_Madera_Creek\mxd\HRA\Figure BAAQMD Permitted Facilities.mxd 10/16/2020 PG

Figure 10
BAAQMD Permitted Facilities
Health Risk Assessment

Horizon WATER and ENVIRONMENT

Appendix D

Biological Resources Supporting Information

Special-Status Species Tables

Corte Madera Creek Units 4 and 3 Dewatering and Fish Rescue Plan

Lower College of Marin Corte Madera Creek Restoration Project Draft Dewatering Plan

APPENDIX D

Table D-1 Database Query Results for Special-Status Plant Species in the Project Vicinity

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
			Vascular			
Sonoma alopecurus *Alopecurus aequalis* var. *sonomensis*	CNPS/CNDDB	FE/None/1B.1	May to July	15 to 1,200	Freshwater marshes and swamps and riparian scrub	Moderate; suitable habitat presents in project area (Unit 2)
Napa false indigo *Amorpha californica* var. *napensis*	CNPS/CNDDB	None/None/1B.2	April to July	390 to 6,560	Openings in broadleaved upland forest, chaparral, and cismontane woodland	None; although a 1924 documented occurrence overlaps with the project area, the occurrence polygon is non-specific (CDFW 2020a) and the project is outside the plant's elevation range
bent-flowered fiddleneck *Amsinckia lunaris*	CNPS/CNDDB	None/None/1B.2	March to June	5 to 1,640	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland	Low; limited suitable habitat present in project area (Units 3 and 4)
coast rockcress *Arabis blepharophylla*	CNPS	None/None/4.3	February to May	5 to 3,610	Rocky areas in broadleaved upland forest, coastal bluff scrub, coastal prairie, and coastal scrub	None; no suitable habitat present
Franciscan manzanita *Arctostaphylos franciscana*	CNPS/CNDDB	FE/None/1B.1	February to April	195 to 985	Serpentine areas in coastal scrub	None; no suitable habitat present and outside of elevation range
Mt. Tamalpais manzanita *Arctostaphylos montana* subsp. *montana*	CNPS/CNDDB	None/None/1B.3	February to April	520 to 2,495	Serpentine and rocky areas of chaparral and valley and foothill grassland	None; no suitable habitat present and outside of elevation range

APPENDIX D

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
Presidio manzanita *Arctostaphylos montana* subsp. *ravenii*	CNPS/CNDDB	FE/CE/1B.1	February to March	145 to 705	Serpentine outcrops in chaparral, coastal prairie, and coastal scrub	None; no suitable habitat present and outside of elevation range
Marin manzanita *Arctostaphylos virgata*	CNPS/CNDDB	None/None/1B.2	January to March	195 to 2,295	Sandstone and granitic areas of broadleaved upland forest, closed-cone coniferous forest, chaparral, and North Coast coniferous forest	None; no suitable habitat present and outside of elevation range
marsh sandwort *Arenaria paludicola*	CNPS/CNDDB	FE/CE/1B.1	May to August	5 to 560	Sandy and openings in freshwater or brackish marshes and swamps	Low; limited suitable habitat present in project area (Unit 2)
Carlotta Hall's lace fern *Aspidotis carlotta-halliae*	CNPS	None/None/4.2	January to December	325 to 4,595	Usually serpentine areas of chaparral and cismontane woodland	None; no suitable habitat present and outside of elevation range
Brewer's milk-vetch *Astragalus breweri*	CNPS	None/None/4.2	April to June	295 to 2,395	Often serpentine and volcanic open areas of chaparral, cismontane woodland, meadows and seeps, and open, often gravelly areas of valley and foothill grassland	None; no suitable habitat present and outside of elevation range
ocean bluff milk-vetch *Astragalus nuttallii* var. *nuttallii*	CNPS	None/None/4.2	January to November	5 to 395	Coastal bluff scub and coastal dunes	None; no suitable habitat present
coastal marsh milk-vetch *Astragalus pycnostachyus* var. *pycnostachyus*	CNPS/CNDDB	None/None/1B.2	(April) June to October	0 to 100	Coastal dunes (mesic areas), coastal scrub, and streamsides of coastal salt marshes and swamps	Low; limited suitable habitat present in project area (Unit 2)
alkali milk-vetch *Astragalus tener* var. *tener*	CNPS/CNDDB	None/None/1B.2	March to June	0 to 195	Alkaline areas of playas, adobe clay areas of valley and foothill grassland and	None; no suitable habitat present

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
					vernal pools	
Thurber's reed grass *Calamagrostis crassiglumis*	CNPS/CNDDB	None/None/2B.1	May to August	30 to 195	Mesic areas of coastal scrub and freshwater marshes and swamps	Low; limited suitable habitat present in project area (Unit 2)
serpentine reed grass *Calamagrostis ophitidis*	CNPS	None/None/4.3	April to July	295 to 3,495	Serpentine and rocky areas of open, often north-facing slopes of chaparral, lower montane coniferous forest, meadows and seeps, and valley and foothill grassland	None; no suitable habitat present and outside of elevation range
Brewer's calandrinia *Calandrinia breweri*	CNPS	None/None/4.2	(January) March to June	30 to 4,005	Sandy or loamy, disturbed sites and burned areas of chaparral and coastal scrub	None; no suitable habitat present
Tiburon mariposa lily *Calochortus tiburonensis*	CNPS/CNDDB	FT/CT/1B.1	March to June	160 to 490	Serpentine areas of valley and foothill grassland	None; no suitable habitat present and outside of elevation range
Oakland star-tulip *Calochortus umbellatus*	CNPS	None/None/4.2	March to May	325 to 2,295	Often serpentine areas of broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland	None; no suitable habitat present and outside of elevation range
coastal bluff morning-glory *Calystegia purpurata* subsp. *saxicola*	CNPS/CNDDB	None/None/1B.2	(March) April to September	0 to 345	Coastal bluff scrub, coastal dune, coastal scrub, and North Coast coniferous forest	None; no suitable habitat present

APPENDIX D

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
seaside bittercress *Cardamine angulata*	CNPS/CNDDB	None/None/2B.2	(January) March to July	80 to 3,000	Wet areas and streambanks of lower montane coniferous forest and North Coast coniferous forest	Moderate; suitable habitat presents in project area (Unit 4)
bristly sedge *Carex comosa*	CNPS/CNDDB	None/None/2B.1	May to September	0 to 2,050	Coastal prairie, lake margins of marshes and swamps and valley and foothill grassland	Moderate; suitable habitat presents in project area (Unit 2)
Lyngbye's sedge *Carex lyngbyei*	CNPS/CNDDB	None/None/2B.2	April to August	0 to 35	Brackish or freshwater marshes and swamps	Moderate; suitable habitat presents in project area (Unit 2)
northern meadow sedge *Carex praticola*	CNPS/CNDDB	None/None/2B.2	May to July	0 to 10,500	Mesic areas of meadows and seeps	None; no suitable habitat present
Tiburon paintbrush *Castilleja affinis* var. *neglecta*	CNPS/CNDDB	FE/CT/1B.2	April to June	195 to 1,310	Serpentine areas of valley and foothill grassland	None; no suitable habitat present and outside of elevation range
johnny-nip *Castilleja ambigua* var. *ambigua*	CNPS	None/None/4.2	March to August	0 to 1,425	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, and vernal pool margins	Moderate; suitable habitat presents in project area (Unit 2)
Nicasio ceanothus *Ceanothus decornutus*	CNPS/CNDDB	None/None/1B.2	March to May	770 to 950	Serpentine, rocky, sometimes clay areas of maritime chaparral	None; no suitable habitat present and outside of elevation range
glory brush *Ceanothus gloriosus* var. *exaltatus*	CNPS	None/None/4.3	March to June (August)	95 to 2,000	Chaparral	None; no suitable habitat present
Point Reyes ceanothus *Ceanothus gloriosus* var. *gloriosus*	CNPS	None/None/4.3	March to May	15 to 1,705	Sandy areas of coastal bluff scrub, closed-cone coniferous forest, coastal	None; no suitable habitat present

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
					dunes, and coastal scrub	
Mason's ceanothus *Ceanothus masonii*	CNPS/CNDDB	None/CR/1B.2	March to April	750 to 1,640	openings, rocky and serpentine areas of chaparral	None; no suitable habitat present and outside of elevation range
Kern ceanothus *Ceanothus pinetorum*	CNPS	None/None/4.3	May to July	5,245 to 9,005	Rocky and granitic areas of lower montane coniferous forest, subalpine coniferous forest, and upper montane coniferous forest	None; no suitable habitat present and outside of elevation range
Monterey ceanothus *Ceanothus rigidus*	CNPS	None/None/4.2	February to April (June)	5 to 1,805	Sandy areas of closed-cone coniferous forest, chaparral, and coastal scrub	None; no suitable habitat present
Point Reyes bird's-beak *Chloropyron maritimum* subsp. *palustre*	CNPS/CNDDB	None/None/1B.2	June to October	0 to 35	Coastal salt marshes and swamps	Moderate; suitable habitat presents in project area (Unit 2)
San Francisco Bay spineflower *Chorizanthe cuspidata* var. *cuspidata*	CNPS/CNDDB	None/None/1B.2	April to July (August)	5 to 705	Sandy areas of coastal bluff scrub, coastal dunes, coastal prairie, and coastal scrub	None; no suitable habitat present
Sonoma spineflower *Chorizanthe valida*	CNPS	FE/CE/1B.1	June to August	30 to 1,000	Sandy areas of coastal prairie	None; no suitable habitat present
Franciscan thistle *Cirsium andrewsii*	CNPS/CNDDB	None/None/1B.2	March to July	0 to 490	Mesic, sometimes serpentine areas of broadleaved upland forest, coastal bluff scrub, coastal prairie, and coastal scrub	Low; limited suitable habitat present in project area (Unit 4)

APPENDIX D

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
Mt. Tamalpais thistle *Cirsium hydrophilum* var. *vaseyi*	CNPS/CNDDB	None/None/1B.2	May to August	785 to 2,035	Serpentine seeps in broadleaved upland forest, chaparral, and meadows and seeps	None; no suitable habitat present and outside of elevation range
seaside cistanthe *Cistanthe maritima*	CNPS	None/None/4.2	(February) March to June (August)	15 to 985	Sandy areas of coastal bluff scrub, coastal scrub, and valley and foothill grassland	None; no suitable habitat present
Presidio clarkia *Clarkia franciscana*	CNPS/CNDDB	FE/CE/1B.1	May to July	80 to 1,100	Serpentine areas of coastal scrub and valley and foothill grassland	None; no suitable habitat present
round-headed Chinese-houses *Collinsia corymbosa*	CNPS/CNDDB	None/None/1B.2	April to June	0 to 65	Coastal dunes	None; no suitable habitat present
San Francisco collinsia *Collinsia multicolor*	CNPS/CNDDB	None/None/1B.2	(February) March to May	95 to 820	Sometimes serpentine areas of closed-cone coniferous forest and coastal scrub	None; no suitable habitat present
California lady's-slipper *Cypripedium californicum*	CNPS	None/None/4.2	April to August (September)	95 to 9,020	Seeps and streambanks, usually serpentine areas of bogs and fens, and lower coniferous forest	Moderate; suitable habitat presents in project area (Unit 4)
western leatherwood *Dirca occidentalis*	CNPS/CNDDB	None/None/1B.2	January to March (April)	80 to 1,395	Mesic areas of broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland	Moderate; suitable habitat presents in project area (Units 3 and 4)

APPENDIX D

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
California bottle-brush grass *Elymus californicus*	CNPS	None/None/4.3	May to August (November)	45 to 1,540	Mesic areas of broadleaved upland forest, cismontane woodland, North Coast coniferous forest, and riparian woodland	Moderate; suitable habitat presents in project area (Unit 4)
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	CNPS/CNDDB	None/None/1B.2	May to September	0 to 2,295	Serpentinite, sandy to gravelly areas in chaparral, cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland	None; no suitable habitat present
slender cottongrass *Eriophorum gracile*	CNPS	None/None/4.3	May to September	4,195 to 9,515	Acidic bogs and fens, meadows and seeps, and upper montane coniferous forest	None; no suitable habitat present and outside of elevation range
San Francisco wallflower *Erysimum franciscanum*	CNPS	None/None/4.2	March to June	0 to 1,805	Often serpentine or granitic areas, sometimes roadsides of chaparral, coastal dunes, coastal scrub, and valley and foothill grassland	None; no suitable habitat present
Marin checker lily *Fritillaria lanceolata* var. *tristulis*	CNPS/CNDDB	None/None/1B.1	February to May	45 to 490	Coastal bluff scrub, coastal prairie, and coastal scrub	None; no suitable habitat present
fragrant fritillary *Fritillaria liliacea*	CNPS/CNDDB	None/None/1B.2	February to April	5 to 1,345	Often serpentine areas of cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland	Low; limited suitable habitat present in project area (Units 3 and 4)
blue coast gilia *Gilia capitata* subsp.	CNPS/CNDDB	None/None/1B.1	April to July	5 to 655	Coastal dunes and coastal scrub	None; no suitable habitat present

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
chamissonis						
Woolly-headed gilia *Gilia capitata* subsp. *tomentosa*	CNPS/CNDDB	None/None/1B.1	May to July	30 to 720	Serpentine and rocky areas or outcrops in coastal bluff scrub and valley and foothill grassland	None; no suitable habitat present
dark-eyed gilia *Gilia millefoliata*	CNPS/CNDDB	None/None/1B.2	April to July	5 to 100	Coastal dunes	None; no suitable habitat present
San Francisco gumplant *Grindelia hirsutula* var. *maritima*	CNPS/CNDDB	None/None/3.2	June to September	45 to 1,310	Sandy and serpentine areas of coastal dunes, coastal bluff scrub, coastal scrub, and valley and foothill grassland	None; no suitable habitat present
Diablo helianthella *Helianthella castanea*	CNPS/CNDDB	None/None/1B.2	March to June	195 to 4,265	Usually rocky, axonal soils, areas often in partial shade in broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland	None; no suitable habitat present and outside of elevation range
congested-headed hayfield tarplant *Hemizonia congesta* subsp. *congesta*	CNPS/CNDDB	None/None/1B.2	April to November	65 to 1,835	Sometimes roadsides of valley and foothill grassland	None; no suitable habitat present
Marin western flax *Hesperolinon congestum*	CNPS/CNDDB/ USFWS	FT/CT/1B.1	April to July	15 to 1,215	Serpentine areas of chaparral and valley and foothill grassland	None; no suitable habitat present
water star-grass *Heteranthera dubia*	CNPS/CNDDB	None/None/2B.2	July to October	95 to 4,905	Requires a pH of 7 or higher, usually in slightly	None; no suitable habitat present

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
					eutrophic waters in alkaline, still or slow-moving waters in marshes and swamps	
Santa Cruz tarplant *Holocarpha macradenia*	CNPS/CNDDB/ USFWS	FT/CE/1B.1	June to October	30 to 720	Often clay and sandy areas of coastal prairie, coastal scrub, and valley and foothill grassland	None; although an 1883 documented occurrence overlaps with the project area, the occurrence polygon is non-specific (CDFW 2020a), it is considered extirpated, and suitable habitat is not present
Kellogg's horkelia *Horkelia cuneata* var. *sericea*	CNPS/CNDDB	None/None/1B.1	April to September	30 to 655	Sandy or gravelly areas and openings in closed-cone coniferous forest, maritime chaparral, coastal dunes, and coastal scrub	None; no suitable habitat present
Point Reyes horkelia *Horkelia marinensis*	CNPS/CNDDB	None/None/1B.2	May to September	15 to 2,475	Sandy areas of coastal dunes, coastal prairie, and coastal scrub	None; no suitable habitat present
thin-lobed horkelia *Horkelia tenuiloba*	CNPS/CNDDB	None/None/1B.2	May to July (August)	160 to 1,640	Mesic openings and sandy areas of broadleaved upland forest, chaparral, and valley and foothill grassland	None; no suitable habitat present and outside of elevation range
coast iris *Iris longipetala*	CNPS	None/None/4.2	March to May	0 to 1,970	Mesic areas of coastal prairie, lower montane coniferous forest, and meadows and seeps	None; no suitable habitat present

APPENDIX D

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
small groundcone *Kopsiopsis hookeri*	CNPS/CNDDB	None/None/2B.3	April to August	295 to 2,905	North Coast coniferous forest	None; no suitable habitat present and outside of elevation range
beach layia *Layia carnosa*	CNPS/CNDDB	FE/CE/1B.1	March to July	0 to 195	Coastal dunes and sandy areas of coastal scrub	None; no suitable habitat present
bristly leptosiphon *Leptosiphon acicularis*	CNPS	None/None/4.2	April to July	180 to 4,920	Chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland	None; no suitable habitat present and outside of elevation range
coast yellow leptosiphon *Leptosiphon croceus*	CNPS	None/CC/1B.1	April to June	30 to 490	Coastal bluff scrub and coastal prairie	None; no suitable habitat present
large-flowered leptosiphon *Leptosiphon grandiflorus*	CNPS	None/None/4.2	April to August	15 to 4,005	Usually sandy areas of coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, and valley and foothill grassland	Low; limited suitable habitat present in project area (Units 3 and 4)
rose leptosiphon *Leptosiphon rosaceus*	CNPS/CNDDB	None/None/1B.1	April to July	0 to 330	Coastal bluff scrub	None; no suitable habitat present
San Francisco lessingia *Lessingia germanorum*	CNPS/CNDDB	FE/CE/1B.1	(June) July to November	80 to 360	Remnant dunes of coastal scrub	None; no suitable habitat present
woolly-headed lessingia *Lessingia hololeuca*	CNPS	None/None/3	June to October	45 to 1,000	Clay and serpentine areas of broadleaved upland forest, coastal scrub, lower montane coniferous forest, and valley and foothill grassland	None; no suitable habitat present

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
Tamalpais lessingia *Lessingia micradenia* var. *micradenia*	CNPS/CNDDB	None/None/1B.2	(June) July to October	325 to 1,640	Usually serpentine areas, often roadsides, in chaparral and valley and foothill grassland	None; no suitable habitat present and outside of elevation range
Mt. Diablo cottonweed *Micropus amphibolus*	CNPS	None/None/3.2	March to May	145 to 2,705	Rocky areas of broadleaved upland forest, chaparral, cismontane woodland, and valley and foothill grassland	None; no suitable habitat present and outside of elevation range
marsh microseris *Microseris paludosa*	CNPS/CNDDB	None/None/1B.2	April to June (July)	15 to 1,165	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland	Moderate; suitable habitat presents in project area (Units 3 and 4)
Baker's navarretia *Navarretia leucocephala* subsp. *bakeri*	CNPS	None/None/1B.1	April to July	15 to 5,710	Mesic areas of cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools	Moderate; suitable habitat presents in project area (Unit 4)
Marin County navarretia *Navarretia rosulata*	CNPS/CNDDB	None/None/1B.2	May to July	655 to 2,085	Serpentine and rocky areas of closed-cone coniferous forest and chaparral	None; no suitable habitat present and outside of elevation range
white-rayed pentachaeta *Pentachaeta bellidiflora*	CNPS/CNDDB/ USFWS	FE/CE/1B.1	March to May	110 to 2,035	Cismontane woodland, and often serpentine areas of valley and foothill grassland	None; although a 1912 documented occurrence overlaps with the project area, the occurrence polygon is non-specific (CDFW 2020a), it is

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
						considered extirpated, and the project is outside the plant's elevation range
Gairdner's yampah *Perideridia gairdneri* subsp. *gairdneri*	CNPS	None/None/4.2	June to October	0 to 2,000	Vernally mesic areas of broadleaved upland forest, chaparral, coastal prairie, valley and foothill grassland, and vernal pools	Moderate; suitable habitat presents in project area (Unit 4)
Michael's rein orchid *Piperia michaelii*	CNPS	None/None/4.2	April to August	5 to 3,000	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest	Moderate; suitable habitat presents in project area (Units 3 and 4)
Choris' popcornflower *Plagiobothrys chorisianus* var. *chorisianus*	CNPS/CNDDB	None/None/1B.2	March to June	5 to 525	Mesic areas in chaparral, coastal prairie, and coastal scrub	None; no suitable habitat present
San Francisco popcornflower *Plagiobothrys diffusus*	CNPS/CNDDB	None/CE/1B.1	March to June	195 to 1,180	Coastal prairie and valley and foothill grassland	None; no suitable habitat present and outside of elevation range
hairless popcornflower *Plagiobothrys glaber*	CNPS/CNDDB	None/None/1A	March to May	45 to 590	Alkaline meadows and seeps and coastal salt marshes and swamps	Low; limited suitable habitat present in project area (Unit 2)
North Coast semaphore grass *Pleuropogon hooverianus*	CNPS/CNDDB	None/CT/1B.1	April to June	30 to 2,200	Open and mesic areas of broadleaved upland forest, meadows and seeps, and North Coast coniferous forest	Moderate; suitable habitat presents in project area (Units 3 and 4)
nodding semaphore grass *Pleuropogon refractus*	CNPS	None/None/4.2	(March) April to August	0 to 5,250	Mesic areas of lower montane coniferous	Moderate; suitable habitat presents in project area

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
					forest, meadows and seeps, North Coast coniferous forest, and riparian forest	(Units 3 and 4)
Oregon polemonium *Polemonium carneum*	CNPS/CNDDB	None/None/2B.2	April to September	0 to 6,005	Coastal prairie, coastal scrub, and lower montane coniferous forest	None; no suitable habitat present
Marin knotweed *Polygonum marinense*	CNPS/CNDDB	None/None/3.1	(April) May to August (October)	0 to 35	Coastal salt or brackish marshes and swamps	Moderate; suitable habitat presents in project area (Unit 2)
Tamalpais oak *Quercus parvula* var. *tamalpaisensis*	CNPS/CNDDB	None/None/1B.3	March to April	325 to 2,460	Lower montane coniferous forest	None; no suitable habitat present and outside of elevation range
Lobb's aquatic buttercup *Ranunculus lobbii*	CNPS	None/None/4.2	February to May	45 to 1,540	Mesic areas of cismontane woodland, North Coast coniferous forest, valley and foothill grassland, and vernal pools	None; no suitable habitat present
Victor's gooseberry *Ribes victoris*	CNPS	None/None/4.3	March to April	325 to 2,460	Mesic, shady areas of broadleaved upland forest and chaparral	None; no suitable habitat present and outside of elevation range
adobe sanicle *Sanicula maritima*	CNPS/CNDDB	None/CR/1B.1	February to May	95 to 785	Clay and serpentine areas of chaparral, coastal prairie, meadows and seeps, and valley and foothill grassland	None; no suitable habitat present
Point Reyes checkerbloom *Sidalcea calycosa* subsp. *rhizomata*	CNPS/CNDDB	None/None/1B.2	April to September	5 to 245	Freshwater, near coast marshes and swamps	Low; limited suitable habitat present in project area (Unit 2)
Marin checkerbloom *Sidalcea hickmanii* subsp.	CNPS/CNDDB	None/None/1B.1	May to June	160 to 1,410	Serpentine areas of chaparral	None; no suitable habitat present and outside of

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
viridis						elevation range
Scouler's catchfly *Silene scouleri* subsp. *scouleri*	CNPS/CNDDB	None/None/2B.2	(March to May) June to August (September)	0 to 1,970	Coastal bluff scrub, coastal prairie, and valley and foothill grassland	None; no suitable habitat present
San Francisco campion *Silene verecunda* subsp. *verecunda*	CNPS/CNDDB	None/None/1B.2	(February) March to June (August)	95 to 2,115	Sandy areas of coastal bluff scrub, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland	None; no suitable habitat present
long-styled sand-spurrey *Spergularia macrotheca* var. *longistyla*	CNPS/CNDDB	None/None/1B.2	February to May (June)	0 to 835	Alkaline areas of meadows and seeps and marshes and swamps	None; no suitable habitat present
Santa Cruz microseris *Stebbinsoseris decipiens*	CNPS/CNDDB	None/None/1B.2	April to May	30 to 1,640	Open and sometimes serpentine areas of broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland	Low; limited suitable habitat present in project area (Units 3 and 4)
Tamalpais jewelflower *Streptanthus batrachopus*	CNPS/CNDDB	None/None/1B.3	April to July	1,000 to 2,135	Serpentine areas of closed-cone coniferous forest and chaparral	None; no suitable habitat present and outside of elevation range
Tiburon jewelflower *Streptanthus glandulosus* subsp. *niger*	CNPS/CNDDB	FE/CE/1B.1	May to June	95 to 490	Serpentine areas of valley and foothill grassland	None; no suitable habitat present
Mt. Tamalpais bristly jewelflower *Streptanthus glandulosus* subsp. *pulchellus*	CNPS/CNDDB	None/None/1B.2	May to July (August)	490 to 2,625	Serpentine areas of chaparral and valley and foothill grassland	None; no suitable habitat present and outside of elevation range

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
Suisun Marsh aster *Symphyotrichum lentum*	CNPS/CNDDB	None/None/1B.2	(April) May to November	0 to 10	Brackish or freshwater marshes and swamps	Moderate; suitable habitat presents in project area (Unit 2)
two-fork clover *Trifolium amoenum*	CNPS/CNDDB/ USFWS	FE/None/1B.1	April to June	15 to 1,360	Coastal bluff scrub, and sometimes serpentine areas of valley and foothill grassland	None; no suitable habitat present
saline clover *Trifolium hydrophilum*	CNPS/CNDDB	None/None/1B.2	April to June	0 to 985	Marshes and swamps, mesic and alkaline areas of valley and foothill grassland, and vernal pools	Moderate; suitable habitat presents in project area (Unit 2)
San Francisco owl's-clover *Triphysaria floribunda*	CNPS/CNDDB	None/None/1B.2	April to June	30 to 525	Usually serpentine areas of coastal prairie, coastal scrub, and valley and foothill grassland	None; no suitable habitat present
Nonvascular						
Koch's cord moss *Entosthodon kochii*	CNPS/CNDDB	None/None/1B.3	n/a	590 to 3,280	Soil in cismontane woodland	None; outside of elevation range
minute pocket moss *Fissidens pauperculus*	CNPS/CNDDB	None/None/1B.2	n/a	30 to 3,360	Damp coastal soil of North Coast coniferous forest	None; no suitable habitat present
island rock lichen *Hypogymnia schizidiata*	CNPS/CNDDB	None/None/1B.3	n/a	1,180 to 1,330	Bark and wood of hardwoods and conifers of closed-cone coniferous forest, and chaparral	None; no suitable habitat present and outside of elevation range
elongate copper moss *Mielichhoferia elongata*	CNPS/CNDDB	None/None/4.3	n/a	0 to 6,430	Metamorphic rock, usually acidic, usually vernally mesic, often roadsides, sometimes carbonate areas of broadleaved upland	Low; suitable habitat potentially present in project area (Units 3 and 4)

Common Name Scientific Name	Query Sources	Status [a] Federal/ State/ CRPR	Blooming Period	Elevation Range (feet)	Habitat Associations	Likelihood to Occur in Project Area
					forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, and subalpine coniferous forest	
coastal triquetrella *Triquetrella californica*	CNPS/CNDDB	None/None/1B.2	n/a	30 to 330	Soils of coastal bluff scrub and coastal scrub	None; no suitable habitat present

Status Codes:

Federal

FE Listed as endangered under the federal Endangered Species Act

FT Listed as threatened under the federal Endangered Species Act

State

SE Listed as Endangered under the California Endangered Species Act

ST Listed as Threatened under the California Endangered Species Act

California Rare Plant Rank (CRPR)

1B Plants rare, threatened, or endangered in California and elsewhere

2B Plants rare, threatened, or endangered in California, but more common elsewhere

3 More information needed about this plant, a review list

4 Plants of limited distribution, a watch list

0.1 Seriously threatened in California (high degree/immediacy of threat)

0.2 Fairly threatened in California (moderate degree/immediacy of threat)

0.3 Not very threatened in California (low degree/immediacy of threats or no current threats known)

Table D-2 Database Query Results for Sensitive Natural Communities in the Project Vicinity

Natural Community (Holland 1986)	Query Sources	Status [a] (State Rank)	Distribution and Habitat Description	Potential Sensitive Natural Communities (CNPS 2020b)	Likelihood within project area
Coastal Brackish Marsh	CNDDB	S2.1	Usually at the interior edges of coastal bays and estuaries or in coastal lagoons. Most extensively developed around Suisun Bay at the mouth of the Sacramento-San Joaquin Delta. Dominated by perennial, emergent, herbaceous monocots to two meters tall. Cover is often complete and dense; plant species include plants from both salt marshes and freshwater marshes.	• Pacific silverweed marshes (*Argentina egedii*) • Salt marsh bulrush marshes (*Bolboschoenus maritimus*) • Slough sedge swards (*Carex obnupta*) • Gum plant patches (*Grindelia (camporum, stricta)*) • Salt rush swales (*Juncus lescurii*) • Water-parsley marsh (*Oenanthe sarmentosa*) • Ditch-grass mats (*Ruppia (cirrhosa, maritima)*) • Pondweed mats (*Stuckenia (pectinata) - Potamogeton spp.*)	High, species and structure are present in project area.
Coastal Terrace Prairie	CNDDB	S2.1	Occurs from Santa Cruz County north to the Oregon border, often associated with northern coastal scrub. Dominated by tall rhizomatous and cespitose native perennial grasses forming dense cover on sandy loam soils near the coastal fog zone.	• Pacific reed grass meadows (*Calamagrostis nutkaensis*) • Oatgrass meadow (*Danthonia californica*) • Idaho fescue - California oatgrass grassland (*Festuca rubra*)	None; no species or structure present in project area.
Northern Coastal Salt Marsh	CNDDB	S3.2	Occurs along the coast from Pt. Conception north to the Oregon border; extensive in the Bay Area and Humboldt, Marin, Monterey, and San Luis Obispo Counties. Found on hydric soils subject to regular tidal inundation in bays, lagoons, and estuaries. Dominated by herbaceous, salt-tolerant	• Pacific silverweed marshes (*Ageratina egedii*) • Parish's glasswort patches (*Arthrocnemum subterminale*) • Alkali heath marsh (*Frankenia salina*) • Gum plant patches (Grindelia (camporum, stricta))	High, species and structure are present in project area.

Natural Community (Holland 1986)	Query Sources	Status [a] (State Rank)	Distribution and Habitat Description	Potential Sensitive Natural Communities (CNPS 2020b)	Likelihood within project area
			hydrophytes, forming moderate to relatively complete cover, generally growing throughout the summer and dormant in winter.	• Pickleweed mats (Sarcocornia pacifica (Salicornia depressa)) • Western sea-purslane marshes (Sesuvium verrucosum) • California cordgrass marsh (Spartina foliosa)	
Serpentine Bunchgrass	CNDDB	S2.2	Often considered part of the coastal prairie, this series extends from coastal terraces to inland bald hills where it can associate with other series on a fine scale. Upslopes and ridges.	– Idaho fescue - California oatgrass grassland (*Festuca rubra*)	None; no species or structure present in project area.

[a] Status codes:
S1 Critically imperiled
S2 Imperiled
S3 Vulnerable
0.1 Very threatened
0.2 Threatened

Table D-3 Database Query Results for Special-Status Wildlife and Fish Species in the Project Vicinity

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Invertebrates					
Black abalone *Haliotis cracherodii*	NMFS	FE/–	Point Arena in northern California to Bahia Tortugas and Isla Guadalupe, Mexico	Intertidal and shallow subtidal rocks, in areas of moderate to heavy surf action	None; suitable habitat not found in project area
California freshwater shrimp *Syncaris pacifica*	CNDDB	FE/SE	Sonoma, Napa, and Marin counties	Low-elevation, low-gradient perennial or intermittent freshwater streams with perennial pools and structurally diverse banks	None; no suitable habitat, and no known occurrences in Corte Madera Creek
Western bumble bee *Bombus occidentalis*	CNDDB	–/SCE	Throughout California and adjacent states	Uses flowering plants in meadows and forested openings; abandoned rodent burrows are used for nest and hibernation sites for queens	None; suitable habitat not found in project area
San Bruno elfin butterfly *Callophrys mossii bayensis*	USFWS	FE/–	Largest population on San Bruno Mountain in San Mateo County; smaller populations may occur in Contra Costa and Marin counties	Coastal scrub; host plant is Pacific stonecrop (*Sedum spathulifolium*)	None; suitable habitat not found in project area
Bay checkerspot butterfly *Euphydryas editha bayensis*	CNDDB	FT/–	Populations only known in San Mateo and Santa Clara counties	Serpentinite soils; host plants are dwarf plantain (*Plantago erecta*) or purple owl's clover (*Castilleja densiflora/C. exserta*)	None; outside of the species' range
Mission blue butterfly *Icaricia icarioides missionensis*	CNDDB, USFWS	FE/–	Scattered localities in San Mateo, Marin (Marin Headlands), and San Francisco counties	Native grassland; host plants are *Lupinus albifrons* (preferred), *L. formosus*, and *L. variicolor* (perennial lupine)	None; suitable habitat not found in the project area

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	USFWS	FE/–	Four populations known in western Marin and southwestern Sonoma counties	Coastal dune or prairie; host plant typically western dog violet (*Viola adunca*)	None; suitable habitat not found in project area
			Fish		
North American green sturgeon: southern DPS *Acipenser medirostris*	NMFS	FT/SSC	San Francisco, San Pablo, Suisun, and Humboldt bays; Sacramento-San Joaquin Delta, Sacramento and Klamath rivers	Spawns in pools of large freshwater river mainstems with cool water and cobble, clean sand, or bedrock; in San Francisco Bay adults tend to utilize water depths less than 33 feet to swim near the surface or forage along the sea floor	None; no suitable habitat in project area
Tomales roach *Lavinia symmetricus* ssp.	CNDDB	–/SSC	Restricted to the western Marin County drainages of Lagunitas Creek and Walker Creek	No habitat requirement studies done specifically on Tomales roach, but assumed to be like roach from adjacent watersheds	None; outside species' range
Sacramento splittail *Pogonichthys macrolepidotus*	CNDDB	–/SSC	Lower portions of the Napa, Petaluma, Sacramento, and San Joaquin rivers; Sacramento-San Joaquin Delta including Suisun Bay, Suisun Marsh	Low elevation mainstem rivers and estuaries with low to moderate salinity (0-18 ppt); shallow, flooded vegetated habitat for spawning and foraging	None; outside species' range
Delta smelt *Hypomesus transpacificus*	USFWS	FT/SE	Found only in the Sacramento-San Joaquin Estuary, including the lower reaches of Sacramento and Napa rivers; the Delta including Suisun Bay, Goodyear, Suisun, Cutoff,	Estuarine or brackish waters up to 18 ppt; spawn in shallow brackish water upstream of the mixing zone (zone of saltwater-freshwater interface) where salinity is around 2 ppt	None; outside species' range

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
			First Mallard, and Montezuma sloughs		
Longfin Smelt *Spirnichus thaleichthys*	CNDDB	FPT/ST	San Francisco estuary from Rio Vista or Medford Island in the Delta as far downstream as South Bay; concentrated in Suisun, San Pablo, and North San Francisco bays; historical populations in Humboldt Bay, Eel River estuary, and Klamath River estuary	Adults in large bays, estuaries, and nearshore coastal areas; migrate into freshwater rivers to spawn; salinities of 15 to 30 ppt. Spawn on sandy substrate in low velocity reaches.	None; no suitable habitat in project area
Southern eulachon DPS *Thaleichthys pacificus*	CNDDB	FT/--	Skeena River in British Columbia (inclusive) south to the Mad River in Northern California (inclusive)	An anadromous fish that historically used the Klamath River estuary and lowest portions of the river to spawn; few to no individuals currently use the estuary; most of their life is spent in the ocean	None; outside species' range
Coho salmon, central California coast ESU *Oncorhynchus kisutch*	CNDDB, NMFS	FE/SE	Punta Gorda south to the San Lorenzo River in central California	Streams; spawns in gravel riffles	Low; presumed extirpated in Corte Madera Creek
Chinook salmon, central Valley spring-run ESU *Oncorhynchus tshawytscha*	NMFS	FT/ST	Sacramento River and its tributaries (Deer, Mill, Antelope, Battle, Beegum, Butte, and Big Chico creeks and the Feather and Yuba rivers)	Low- to mid-elevation rivers and streams with cold water, clean gravel of appropriate size for spawning and adequate rearing habitat; typically rear in freshwater for one or more years before migrating to the ocean	None; outside species' range

APPENDIX D

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Chinook salmon, Sacramento River winter-run ESU *Oncorhynchus tshawytscha*	NMFS	FE/SE	Sacramento River and its tributaries; Sacramento-San Joaquin Delta; San Francisco, San Pablo and Suisun bays	Mainstem river reaches with cool water and available spawning gravel; rear five to ten months in the river and estuary; migrate to the ocean to feed and grow until sexually mature	None; outside species' range
Steelhead, central California coast DPS *Oncorhynchus mykiss*	CNDDB	FT/–	Coastal California streams from the Russian River, south to Aptos Creek, San Francisco, San Pablo, and Suisun bays; the drainages of San Francisco, San Pablo, and Suisun bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin rivers; excludes the Sacramento San Joaquin Delta,	Rivers and streams with cold water, clean gravel of appropriate size for spawning, and suitable rearing habitat; typically rear in fresh water for one or more years before migrating to the ocean	High; known to be present in Corte Madera Creek
Steelhead, Central Valley DPS *Oncorhynchus mykiss*	NMFS	FT/–	Sacramento and San Joaquin rivers and their tributaries	Rivers and streams with cold water, clean gravel of appropriate size for spawning, and suitable rearing habitat; typically rear in freshwater for one or more years before migrating to the ocean	None; outside species' range
Tidewater goby *Eucyclogobius newberryi*	CNDDB, USFWS	FE/SSC	San Diego county north to the mouth of the Smith River in Del Norte County	Coastal lagoons and the uppermost zone of brackish large estuaries; prefer sandy substrate for spawning, but can be found on silt, mud, or rocky substrates; can occur in water up to 15 feet in	None; no suitable habitat in project area and presumed extirpated by CDFW.

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
				lagoons and within a wide range of salinity (0 to 42 ppt)	
Amphibians					
California giant salamander *Dicamptodon ensatus*	CNDDB	–/SSC	From Mendocino County near Point Arena east into the coast ranges into Lake and Glenn counties, south to Sonoma and Marin Counties, continuing south of the San Francisco Bay from San Mateo County to southern Santa Cruz County	Wet coastal forests in or near clear, cold permanent and semi-permanent streams and seepages	Low; marginally suitable habitat in Unit 4; reported observations in Corte Madera Creek watershed (Friends of Corte Madera Watershed 2004)
California red-legged frog *Rana draytonii*	CNDDB, USFWS	FT/SSC	Largely restricted to coastal drainages on the central coast from Mendocino County to Baja California; in the Sierra foothills south to Tulare and possibly Kern counties	Breeds in still or slow-moving water with emergent and overhanging vegetation, including wetlands, wet meadows, ponds, lakes, and low-gradient, slow moving stream reaches with permanent pools; uses adjacent uplands for dispersal and summer retreat	Low; Suitable habitat is present in the study area, but it is not hydrologically connected to a known population of California; species is presumed absent in eastern Marin County (District 2017)
Foothill yellow-legged frog *Rana boylii*	CNDDB	–/SSC Northwest/North Coast Clade (includes project area), –/SE (Southern Sierra, Central Coast and South Coast clades), ST (Feather River and	From the Oregon border along the coast to the Transverse Ranges, and south along the western side of the Sierra Nevada Mountains to Kern County; a possible isolated population in Baja California. Last recorded	Shallow tributaries and mainstems of perennial streams and rivers, typically associated with cobble or boulder substrate	None; considered extirpated from eastern Marin County (CDFW 2020)

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
		Northern Sierra clades)	observation in project area was in 1913.		
			Reptiles		
Western pond turtle *Actinemys marmorata*	CNDDB	–/SSC	From the Oregon border along the coast ranges to the Mexican border, and west of the crest of the Cascades and Sierras	Permanent, slow-moving fresh or brackish water with available basking sites and adjacent open habitats or forest for nesting	Low; suitable aquatic habitat found in Unit 4, though limited upland nesting habitat present
Olive (Pacific) Ridley sea turtle *Lepidochelys olivacea*	NMFS	FT/–	Warm waters of the Pacific coast, primarily from southern California south; does not nest in California	Well out to sea in pelagic zone as well as coastal areas, including bays and estuaries; nests on sandy ocean beaches	None; pelagic species
Green sea turtle *Chelonia mydas*	NMFS, USFWS	FT/–	Warm waters of the Pacific coast, primarily from San Diego south; does not nest in California	Uses convergence zones in the open ocean and benthic feeding grounds in coastal areas; nests on sandy ocean beaches	None; pelagic species
Loggerhead sea turtle *Caretta caretta*	NMFS	FT/–	Warm waters of the Pacific coast, primarily from the Channel Islands south; does not nest in California	Uses the near-shore zone and open ocean; nests on high energy, relatively narrow, steep, coarse-grained beaches	None; pelagic species
Leatherback sea turtle *Dermochelys coriacea*	NMFS	FE/–	Temperate and cool waters of the Pacific coast; most sightings in California are from boats out at sea; have been observed in open ocean near San Diego, Santa Barbara, Ventura, San Mateo, and Santa Cruz counties; does not nest in California	Pelagic, though also forages near coastal waters	None; pelagic species

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
			Birds		
Short-tailed albatross *Phoebastris albatrus*	USFWS	FE/SSC	Pacific Ocean (nests in Japan)	Feeds in open ocean in north Pacific	None; no suitable habitat in project area
White-tailed kite *Elanus leucurus*	CNDDB	–/SFP	Year-round resident; found in nearly all lowlands of California west of the Sierra Nevada mountains and the southeast deserts	Lowland grasslands and wetlands with open areas; nests in trees near open foraging area	Moderate; documented along Corte Madera Creek in project area near Unit 2 (eBird 2020); nesting and foraging habitat present
American peregrine falcon *Falco peregrinus anatum*	CNDDB	FD/SD, SFP	Most of California during migrations and in winter; nests primarily in the Coast Ranges, northern Sierra Nevada Mountains, and other mountainous areas of northern California	Wetlands, woodlands, cities, agricultural lands, and coastal area with cliffs (and rarely broken-top, predominant trees) for nesting; often forages near water	Low; foraging only; documented foraging in Corte Madera Marsh approximately 1.8 miles southeast of project area
California black rail *Laterallus jamaicenis coturniculus*	CNDDB	–/ST, SFP	Northern San Francisco Bay area (primarily San Pablo and Suisun bays) and Sacramento-San Joaquin Delta	Large tidally-influenced marshes with saline to brackish water, typically with a high proportion of pickleweed (*Salicornia virginica*); also can be associated with bulrush (*Schoenoplectus* spp.), cattail (*Typha* spp.), or rushes (*Juncus* spp.); peripheral vegetation at and above mean high higher water necessary to protect nesting birds during extremely high tides	None; no suitable habitat; coastal brackish marsh in Unit 2 at downstream end of project area not extensive enough to support black rail
California Ridgway's rail	CNDDB, USFWS	FE/SE, SFP	Predominantly in the marshes of the San Francisco estuary: South	Salt and brackish water marshes, typically dominated by pickleweed (*Salicornia virginica*)	Moderate; observed in 2020 approximately 600 feet downstream of

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Rallus obsoletus obsoletus			San Francisco Bay, North San Francisco Bay, San Pablo Bay, and sporadically throughout the Suisun Marsh area east to Browns Island	and Pacific cordgrass (*Spartina foliosa*)	project area in tidal marsh
Western snowy plover *Charadrius alexandrinus nivosus*	CNDDB, USFWS	FT (Pacific coastal population)/SSC (interior population)	Nests in locations along the California coast, including the Eel River in Humboldt County; nests in the interior of the state in the Central Valley, Klamath Basin, Modoc Plateau, and Great Basin, Mojave, and Colorado deserts; winters primarily along coast	Barren to sparsely vegetated beaches, barrier beaches, salt-evaporation pond levees, and shores of alkali lakes; also nests on gravel bars in rivers with wide flood plains; needs sandy, gravelly, or friable soils for nesting	None; no suitable nesting or foraging habitat in project area
California least tern *Sternula antillarum browni*	USFWS	FE/SE, SFP	Pacific coast from San Francisco to Baja California	Sparsely vegetated coastal beaches and estuaries near shallow waters, above high tide line. Nests in colonies of 30 to 50.	None; no suitable nesting or foraging habitat in project area
Marbled murrelet *Brachyramphus marmoratus*	USFWS	FT/SE,	Nesting murrelets in California mostly concentrated on coastal waters near Del Norte and Humboldt counties, and in lesser numbers near San Mateo and Santa Cruz counties; winter throughout nesting range, and in small numbers in southern California	Most time spent on the ocean; nests inland in old-growth conifers with suitable platforms, especially redwood or Douglas-fir forests near coastal areas	None; no suitable nesting or foraging habitat in project area

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Western burrowing owl *Athene cunicularia hypugaea*	CNDDB	–/SSC	Year-round resident throughout much of the state; Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Level, open, dry, heavily-grazed or low- stature grassland or desert vegetation with available burrows	None; no suitable habitat in project area; breeding western burrowing owls are now absent from Marin County
Northern spotted owl *Strix occidentalis caurina*	USFWS	FT/SSC	Northwestern California south to Marin County, and southeast to the Pit River area of Shasta County	Typically in older forested habitats; nests in complex stands dominated by conifers, especially coastal redwood, with hardwood understories; some open areas are important for foraging	None; no suitable habitat in project area
Short-eared owl *Asio flammeus*	CNDDB	–/SSC	Year-round resident in certain areas; breeding in California episodic and a widespread winter migrant, found primarily in the Central Valley, in the western Sierra Nevada foothills, and along the coastline	Irrigated alfalfa or grain fields, ungrazed grasslands, old pastures, and salt or freshwater marshlands	None; no suitable habitat in project area
Black swift *Cypseloides niger*	CNDDB	–/SSC	Breeds locally in Sierra Nevada and Cascade ranges, the San Gabriel, San Bernardino, and San Jacinto Mts., and from San Mateo County south likely to San Luis Obispo County	Nests in moist crevices behind or beside permanent or semipermanent waterfalls in deep canyons, on perpendicular sea cliffs above surf, and in sea caves; forages widely over many habitats	None; no suitable habitat in project area
Bank swallow *Riparia riparia*	CNDDB	–/ST	Summer resident; occurs along the Sacramento River	Nests in vertical bluffs or banks, usually adjacent to water, where	None; no suitable habitat in project area

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
			from Tehama County to Sacramento County, along the Feather and lower American rivers; and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou counties; small populations near the coast from San Francisco County to Monterey County	the soil consists of sand or sandy loam	
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	CNDDB	–/SSC	San Francisco Bay region	Brackish marsh, riparian woodland/swamp, freshwater marsh, and salt marsh often near upland habitats	Moderate; suitable foraging and nesting habitat in the coastal brackish marsh in Unit 2 at the downstream end of the project area
Alameda song sparrow *Melospiza melodia pusillula*	CNDDB	–/SSC	Restricted to the periphery of southern San Francisco Bay	Tidal salt marsh	None; outside of the species' range
San Pablo song sparrow *Melospiza melodia samuelis*	CNDDB	–/SSC	North side of San Francisco and San Pablo bays	Tidal salt marshes; requires dense vegetation for nesting; typically associated with California cord grass (*Spartina foliosa*), pickleweed (*Salicornia pacifica*), or gumplant (*Grindelia stricta*)	Moderate; suitable foraging and nesting habitat in the coastal brackish marsh in Unit 2 at the downstream end of the project area
Mammals					
Point Reyes jumping mouse *Zapus trinotatus orarius*	CNDDB	–/SSC	Point Reyes area	Moist areas, including bunchgrass marshes, deciduous woody vegetation along streams	None; outside of species' range

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
				and seeps, and wet/grassy meadows	
San Pablo vole *Microtus californicus sanpabloensis*	CNDDB	–/SSC	San Pablo Creek, Contra Costa County, on the south shore of San Pablo Bay	Salt marsh	None; outside of the species' range
Salt marsh harvest mouse *Reithrodontomys raviventris*	CNDDB, USFWS	FE/SE, SFP	San Pablo, Suisun, and San Francisco bays in Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, and San Mateo counties	Tidal salt marshes; depend on dense cover, preferring pickleweed (*Salicornia pacifica*) and saltgrass	Low; marginally suitable habitat at the downstream end of project area in tidal marsh
Suisun shrew *Sorex ornatus sinuosus*	CNDDB	–/SSC	Along the north shore of San Pablo and Suisun bays, from Tubbs Island/Sonoma Creek in Sonoma County east to Grizzly Island in Solano County	Areas of low, dense vegetation, in salt and brackish marshes	None; outside of species' range
Salt marsh wandering shrew *Sorex vagrans halicoetes*	CNDDB	–/SSC	San Francisco Bay in San Mateo, Santa Clara, Alameda and Contra Costa counties	Saline emergent wetlands, preferably with pickleweed (*Salicornia virginica*)	None; outside of species' range
Western red bat *Lasiurus blossevillii*	CNDDB	–/SSC	Near the Pacific Coast, Central Valley, and the Sierra Nevada	Riparian forests, woodlands near streams, fields and orchards	Low (foraging only); limited suitable roosting habitat found in project area
Townsend's western big-eared bat *Corynorhinus townsendii*	CNDDB	–/SSC	Throughout California, found in all but subalpine and alpine habitats, details of distribution not well known	Most abundant in mesic habitats, also found in oak woodlands, desert, vegetated drainages, caves or cave-like structures (including basal hollows in large	Low (foraging only); limited suitable roosting habitat found in project area

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
				trees, mines, tunnels, and buildings)	
Pallid bat *Antrozous pallidus*	CNDDB	–/SSC	Throughout California except for elevations greater than 3,000 meters in the Sierra Nevada	Roosts in rock crevices, tree hollows, mines, caves, and a variety of vacant and occupied buildings; feeds in a variety of open woodland habitats	Low (foraging only); limited suitable roosting habitat found in project area
Guadalupe fur seal *Arctocephalus townsendi*	NMFS	FT/ST, SFP	Southern California to Mexico region	During breeding season, found in coastal rocky habitats and caves	None; no suitable habitat in project area
Steller (=northern) sea-lion *Eumetopias jubatus*	CNDDB, NMFS (habitat)	FT/–	Coastal waters of California	Colder waters; haul outs and rookeries usually consist of beaches, ledges, or rocky reefs	None; no suitable habitat in project area
Southern sea otter Enhydra lutris nereis	CNDDB	FT/SFP	Along the coastline from San Mateo County to Santa Barbara County	Protected bays and exposed outer coasts; hard- and soft-sediment marine habitats to depths of less than 100 meters (330 feet).	None; no suitable habitat in project area
American badger *Taxidea taxus*	CNDDB	–/SSC	Throughout the state except in the humid coastal forests of Del Norte County and the northwest portion of Humboldt County	Shrubland, open grasslands, fields, and alpine meadows with friable soils	None; no suitable habitat in project area
Blue whale *Balaenoptera musculus*	NMFS	FE/–	Pacific Ocean	Deep ocean waters; also can be found in coastal waters	None; no suitable habitat in project area
Fin whale *Balaenoptera physalus*	NMFS	FE/–	Pacific Ocean	Deep ocean waters	None; no suitable habitat in project area
Humpback whale *Megaptera novaengliae*	NMFS	FE/–	Pacific Ocean	Deep ocean waters	None; no suitable habitat in project area

APPENDIX D

Common Name Scientific Name	Query Sources	Status [a] Federal/State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area

[a] Status Codes:

Federal		State
FE	= Listed as endangered under the federal Endangered Species Act	SE = Listed as Endangered under the California Endangered Species Act
FT	= Listed as threatened under the federal Endangered Species Act	ST = Listed as Threatened under the California Endangered Species Act
FPE	= Federally proposed as endangered	SCE = State Candidate Endangered
FPT	= Federally proposed as threatened	SD = State Delisted
FC	= Federal candidate species	SSC = CDFW Species of Special Concern
FD	= Federally delisted	SFP = CDFW Fully Protected species
PD	= Federally proposed for delisting	BOFS = Considered a sensitive species by the California Board of Forestry under the California Forest Practice Rules (14 CCR §895.1)
BGEPA	= Federally protected under the Bald and Golden Eagle Protection Act	
FSS	= Forest Service Sensitive species	
BLMS	= Bureau of Land Management Sensitive Species	

Appendix D

Biological Resources Supporting Information

Special-Status Species Tables

Corte Madera Creek Units 4 and 3 Dewatering and Fish Rescue Plan

Lower College of Marin Corte Madera Creek Restoration Project Draft Dewatering Plan

Stillwater Sciences

850 G Street, Suite K, Arcata, CA 95521
phone 707.822.9607

DRAFT TECHNICAL MEMORANDUM

DATE: December 9, 2020

TO: Susanne Heim, Panorama Environmental

FROM: Dennis Halligan, Senior Fisheries Biologist

SUBJECT: Corte Madera Creek Units 4 and 3 Dewatering and Fish Rescue Plan

1 INTRODUCTION

The Marin County Flood Control and Water Conservation District (District) is proposing to construct the Corte Madera Creek Flood Risk Management Project, Phase 1 (Project) (Figure 1). The Project area is located within three Units of Corte Madera Creek as designated by the U.S. Army Corps of Engineers (USACE), shown on Figure 1, and described below. The Project will include the following within the Corte Madera Creek channel:

- removal of an inoperable fish ladder (Unit 4),
- re-grading and stabilizing the natural channel upstream of the inoperable fish ladder (Unit 4),
- removal of the concrete flood control channel and restoration of approximately 800 feet of natural stream channel and floodplain (Unit 3), and
- construction of fish resting pools in the concrete-lined reach (Unit 3), and
- removal of a portion of the concrete-lined channel and restoration of a natural channel and wetlands (Unit 2).

The work in Unit 2 will be permitted by the Friends of Corte Madera Creek, who will also be developing a separate dewatering and fish rescue plan. Their plan is not included in this document and will not be discussed further.

The activities in Units 4 and 3 will require demolition and construction within the wetted Corte Madera Creek channel, which is inhabited by native fish species including steelhead trout. The Project will require the dewatering of the work areas to facilitate demolition and construction. The dewatering activities would likely adversely affect any fish present in the work area at the time of construction. Therefore, a fish removal and relocation program will be implemented prior to and during any dewatering activities.

This document describes the fish removal/relocation actions in Units 4 and 3 that would occur in conjunction with the work area dewatering.

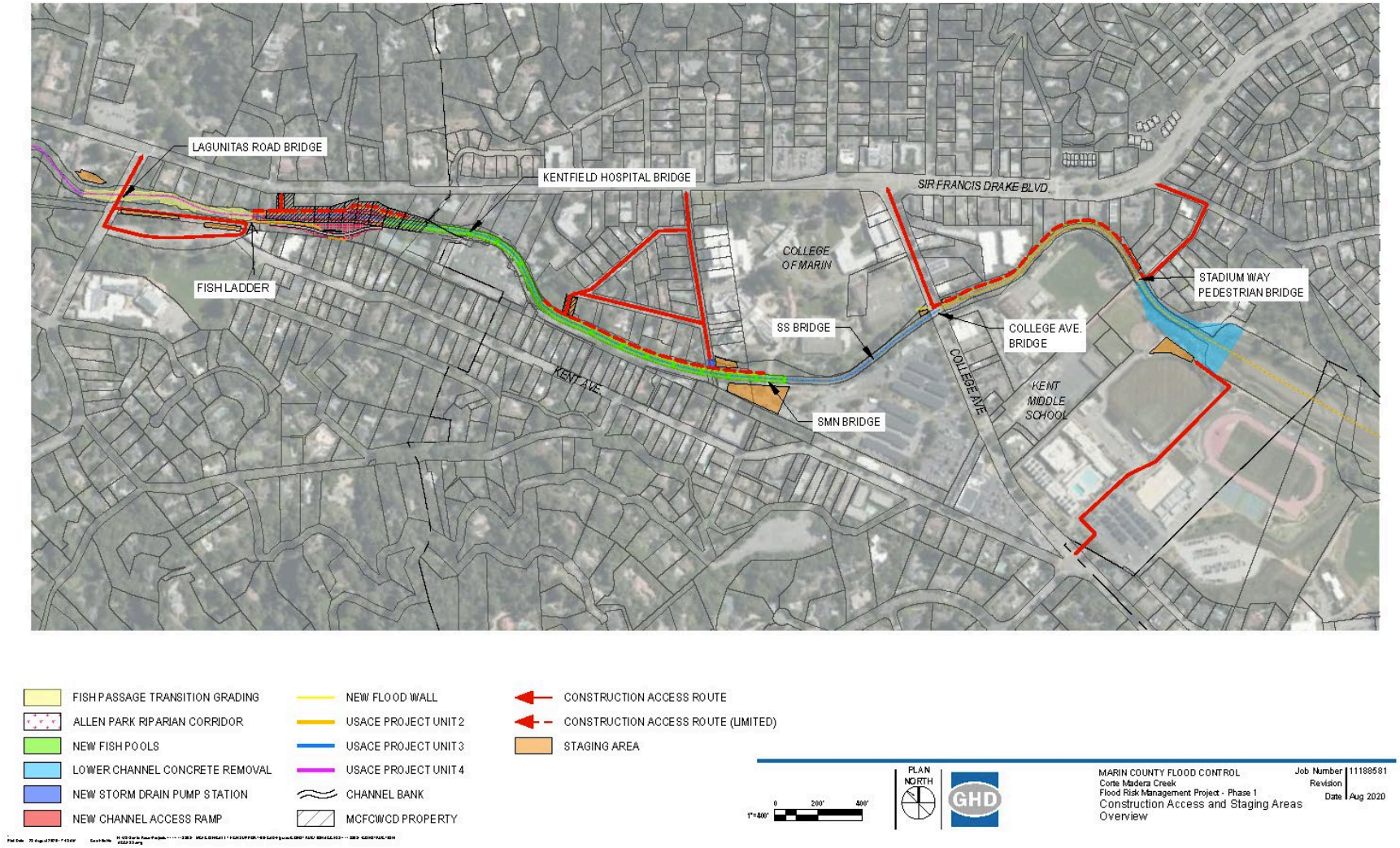


Figure 1. Project reach (GHD 2020).

2 DEWATERING AND FISH RELOCATION

Dewatering of the channel can be accomplished either by controlling the flow in the entire reach or within the individual localized work areas where demolition and construction activities will be performed. However, there are three distinct work areas within the USACE designated units that have their own individual flow and substrate characteristics:

1. Unit 4 (except for the fish ladder) is contained within a natural flowing channel and provides steelhead rearing habitat.
2. Upper Unit 3 is located in the freshwater reach between the fish ladder and Kentfield Hospital Bridge. This reach is contained within a concrete channel with no habitat complexity, and experiences limited fish use during the summer and fall months.
3. Lower Unit 3 is intertidal, extends from the Kentfield Hospital Bridge to the SMN Bridge, is also within a concrete channel, and experiences intertidal flow.

Each of the three work areas will require individualized fish removal and relocation efforts due to their specific characteristics, habitat conditions, lengths, and flow/tidal characteristics.

For the purposes of this plan, it is assumed that a cofferdam will be installed at the upstream end of Unit 4, a second one immediately downstream of the fish ladder, and a third in Unit 3 immediately downstream of the SMN Bridge. There might be interior cofferdams installed within these reaches that could be moved as work progresses, however, the fish removal activities would remain generally the same as described below.

All fish removal and relocation activities will be conducted by biologists that have been approved by the California Department of Fish and Wildlife and National Marine Fisheries Service.

2.1 Unit 4 Cofferdam Installation and Fish Removal

The Unit 4 reach extends from the fish ladder approximately 700 feet upstream, which is about 150 feet upstream of the Lagunitas Road bridge. This reach has a natural pool/riffle morphology and contains habitat for special-status and other fish species. It is expected that the Unit 4 cofferdam will be installed immediately downstream of the #1 Sylvan Lane sheet pile wall. Fish removal in this reach will require two phases. First, Unit 4 will need to be initially cleared of fish prior to cofferdam installation. Second, Unit 4 will require fish removal and relocation as the cofferdam is completed, water is bypassed around the work area, and the site dewatered.

2.1.1 Pre-cofferdam installation

The initial fish removal efforts will occur at least two days prior to installation of the Unit 4 cofferdam and while natural flow is in the channel.

2.1.2 Vegetation trimming

There is a pool that is approximately 110 feet long immediately downstream of the Lagunitas Road Bridge. This pool is located under a dense canopy of willows, which would make it very difficult to capture and remove fish. These willows will need to be trimmed back prior to the bird nesting season to facilitate fish removal efforts. Efforts should also be made to trim back any other riparian vegetation encroaching into the Unit 4 wetted channel at this time. Large and small woody debris should be retained in the channel.

2.1.3 Fish removal and relocation

The following steps are recommended to remove fish from Unit 4 prior to cofferdam installation.

1. Install a block net at the top of the Unit 4 work area and several feet upstream of the cofferdam footprint.
2. Install a block net immediately downstream of the fish ladder.
3. Begin fish removal from individual sub-reach units (e.g., a single pool/riffle/run sequence) in a sequential fashion starting at the fish ladder and moving upstream.
4. Install a block net at the upstream end of the discrete sub-reach to be cleared.
5. Fish will first be removed by use of seines and dip nets. Electrofishers, handled by experienced biologists, may be used if required.
6. Conduct at least three passes through the sub-reach or until no more fish are captured.
7. All captured fish will be held in buckets containing cool, aerated water. No more than 25 fish per bucket.
8. Fish shall not be anesthetized or measured. However, they will be visually identified to species, and year classes of special-status species will be estimated and recorded.
9. Relocate captured fish into suitable habitat areas upstream of the #1 Sylvan Lane sheet pile wall. The buckets of fish will be released in different habitat units upstream of the sheet pile wall to reduce crowding.
10. Once the fish are cleared from the first sub-reach, install a block net at the upstream end of the next section.
11. Repeat the sequence and continue up to the block net at the upstream end of Unit 4.
12. The upstream block net will stay in place during the entire Unit 4 construction period to maintain a fish-free area in front of the cofferdam and bypass structure.
13. The cofferdam can be constructed after fish are cleared from throughout Unit 4.

2.1.4 Dewatering fish removal and relocation

1. The cofferdam construction should begin several feet downstream of the upstream block net.
2. Continue installation of cofferdam to the point of near completion but leaving a gap through which flow can continue downstream. The purpose of leaving a gap is to avoid a rapid cut-off of water that could strand fish as habitat downstream dewaters.
3. Station biologists and buckets containing aerated water at several intervals throughout Unit 4.
4. Slowly fill in the cofferdam gap to begin the backwatering and initiation of the bypass flow. The bypass flow pipe inlet should be contained in a screened containment that complies with the California Department of Fish and Wildlife screening criteria (CDFG 2002).
5. The work area will begin to dewater as the bypass takes an increasing amount of flow. Any remaining fish will become more exposed and available for capture as the water levels drop and habitat units shallow and dry.
6. Fish shall not be anesthetized or measured. However, they will be visually identified to species level, and year classes of special-status species will be estimated and recorded.
7. Any fish captured will be placed in suitable habitat upstream of the #1 Sylvan Lane sheet pile wall.
8. Biologists will remain until the area is fully dewatered.

2.2 Unit 3

Unit 3 extends downstream approximately 3,400 feet from the fish ladder to the College Avenue Bridge. This reach is contained entirely within a concrete-lined channel and becomes intertidal in the vicinity of the Kentfield Hospital Bridge, which is about 900 feet downstream of the fish ladder. The lower extent of the proposed fish resting pool construction is approximately 2,600 feet downstream of the fish ladder and 100 feet below the SMN Bridge. Unit 3 will require two different fish removal techniques; one for freshwater and another that would take advantage of tidal characteristics.

2.2.1 Unit 3 freshwater reach fish removal

The Unit 3 freshwater reach extends from the fish ladder downstream approximately 900 feet to the Kentfield Hospital Bridge. The fish habitat in this reach is of very poor quality and consists of very shallow concrete pools separated by narrow, smooth-bottomed riffles. Fish removal in this reach would be performed as follows:

1. Install a block net at the fish ladder and a second one at the upstream end of the intertidal reach.
2. Conduct a beach seine sweep starting at the fish ladder and moving in a downstream direction.
3. As the sweep moves downstream, biologists in front of the seine will haze fish out of the concrete pools as they are encountered. Any fish captured in the concrete pools will be placed in cool aerated buckets of water for transfer to the reach upstream of the Unit 4 cofferdam.
4. The sweep will continue in a downstream direction until biologists reach the block net at the upper end of the intertidal zone near the Kentfield Hospital.
5. Any fish between the seine and block net will be dip netted and relocated in suitable habitat upstream of Unit 4 and the #1 Sylvan Lane sheet pile wall.
6. Fish shall not be anesthetized or measured. However, they will be visually identified to species level, and year classes of special-status species will be estimated and recorded.
7. The block net at the upstream end of the intertidal reach will remain in place during the intertidal fish removal effort described below.
8. Biologists will remain in the reach as water levels drop following construction of the cofferdam at the fish ladder and initiation of flow bypass and dewatering activities.

2.2.2 Unit 3 Kentfield Hospital to the SMN Bridge intertidal reach

The Unit 3 intertidal reach fish resting pool work area extends approximately 1,700 feet from the Kentfield Hospital downstream to the SMN Bridge. The intertidal concrete channel contains very little suitable habitat for special-status fish species. The initial fish removal efforts will be timed to take advantage of the ebbing tide to assist moving fish downstream. It is recommended that installation of the supersack cofferdam (constructed using large bags or "sacks") downstream of the SMN Bridge and first fish resting pool begin prior to initiation of the fish removal effort. The center section of the supersack cofferdam should stay open and allow the ebb tide to pass until the fish removal effort described below is completed. The tidal flux in this area and lack of anchoring points would make a block net ineffective.

1. The fish removal effort within the intertidal reach would begin at the downstream end of the Unit 3 freshwater reach during the ebbing tide and just prior to low tide.
2. Conduct a single beach seine sweep starting at the freshwater block net and moving in a downstream direction.
3. Any fish present in the shallow concrete pools will be crowded downstream with the seine net.

4. The seine sweep will continue in a downstream direction until it reaches the supersack cofferdam. At that point, the fish will be crowded through the opening in the center of the cofferdam.
5. A block net will be placed immediately downstream of the cofferdam opening to restrict reentry into Unit 3 by fish.
6. The very smooth nature of the concrete channel should allow the single seine net sweep to remove the vast majority of fish present.
7. The block net will remain in place while the opening is closed and the supersack cofferdam is completed.
8. Biologists will remain in the reach to collect any remaining fish as water levels drop following initiation of during bypass activities.

3 DECONTAMINATION

Corte Madera Creek is known to contain New Zealand mud snails. All gear (block nets, seines, dip nets, buckets, etc.) used to capture and relocate fish will undergo decontamination. Decontamination protocols will include:

- Freeze equipment/gear for a minimum of 8 hours at temperatures at 26°F (-3°C) or below.
- Soak equipment/gear in a bath of hot water (at least 120°F, 46°C) for 10 minutes.
- Soak equipment/gear in a bath of a disinfectant containing quaternary ammonium compounds (QAC) (e.g., Quat 4, Quat 128, Super HDQ Neutral, etc.) for 10 minutes. The QAC-containing disinfectant should be diluted with water at a rate to achieve a minimum active QAC concentration of 0.4%. Six (6) ounces of disinfectant to gallon of water can be used as a disinfectant to water ratio (1:21). After removal from the bath, rinse equipment/gear thoroughly with tap water.

4 REFERENCES

CDFG (California Department of Fish and Game). 2002. Fish screen criteria. Appendix S, California Salmonid Stream Habitat Restoration Manual.

GHD. 2020. Overall construction considerations. Prepared for the Marin County Flood Control and Water Conservation District. Santa Rosa, California.

Appendix D

Biological Resources Supporting Information

Special-Status Species Tables

Corte Madera Creek Units 4 and 3 Dewatering and Fish Rescue Plan

Lower College of Marin Corte Madera Creek Restoration Project Draft Dewatering Plan

Lower COM Corte Madera Creek Restoration Project
DRAFT Dewatering Plan
November 27, 2020

The purpose of the Lower College of Marin (Lower COM) Corte Madera Creek Restoration Project (project) is to (1) restore as much natural functioning aquatic, tidal, transitional, and riparian upland habitat as possible within site constraints, in a manner that is adaptive to future sea level rise (SLR) and (2) accommodate floodwater delivered to the channel and convey it to the downstream end of the concrete channel where there is adequate capacity, by removing parts of the downstream end of the USACE concrete flood control channel.

Purpose of this Plan

To ensure potential impacts to aquatic species are avoided or minimized, they will be protected in accordance with this Dewatering Plan. Project activities will require 650 feet of the creek to be dewatered and aquatic species relocated out of the in-stream work area. A qualified biologist, as described in the paragraph *Qualified Biologist*, will implement the plan. This project will operate under U.S. Army Corps of Engineers (USACE) Clean Water Act §404 compliance, USACE Section §408 compliance for modification of an existing USACE structure, §1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW), and §401 Certification from the San Francisco Bay Regional Water Quality Control Board (RWQCB). The USACE will consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) as part of the permit process.

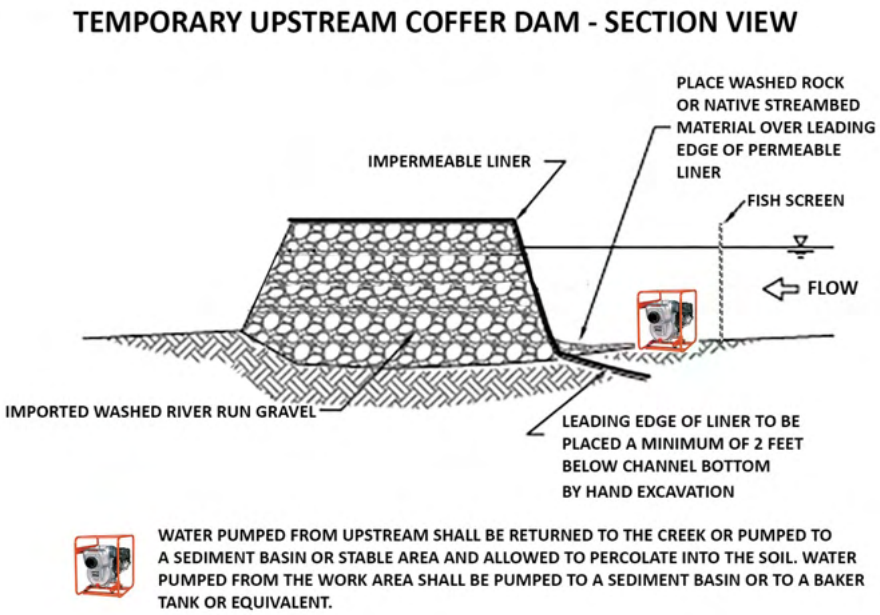
Stages of Construction

To avoid the discharge of sediment-laden water into Corte Madera Creek during construction, the work will take place during summer/fall low flow conditions. Construction is planned for the following stages:

1. Remove most of the soil behind the concrete wall on the right side of the creek (use temporary supports for the wall as necessary)
2. Install fish screens and remove fish from the project area (see below for a description of fish protection measures)
3. When fish removal is near completion, install coffer dams upstream and downstream of the work area
4. Dewater work area and complete fish removal
5. Remove a portion of the right wall to allow construction of a temporary dirt ramp across the creek to provide access for earthmoving equipment to the left bank
6. Remove the downstream section of the left wall and regrade the left bank, hauling material across the dewatered creek; no work will take place in the creek channel other than that necessary to reach the left bank
7. Remove dirt ramp and the remainder of the right wall; regrade the right bank
8. Remove the coffer dams
9. Install plants in fall and winter following construction

Upstream Coffer Dam: Large sandbags (aka super sacks: https://megasack.com/ or similar), filled with off-site gravel and/or sand will be used to construct a coffer dam in the concrete channel upstream of Stadium Way, near the upstream end of the project site (Figure 1). The upstream end of the upstream coffer dam will be reinforced with thick plastic sheeting to act as an additional barrier for water and fish traveling downstream. Water from upstream will be pumped around the work area and back into the creek or onto a stable area and allowed to infiltrate or pumped to the creek below the work area.

Figure 1: Sample coffer dam design



Downstream Coffer Dam: Tides ranging over several feet reach into the work area from downstream and sandbags are not appropriate. Sheet piles will be installed with a silent, reaction-based hydraulic pile machine (aka Giken Silent Piler https://www.giken.com/en/products/silent_piler/ or similar) across the outer edges of the downstream work areas that will need to be dewatered, leaving an opening in the center that can be closed with a bladder or more sheet piles when it becomes necessary to dewater the work area by preventing tidal flow from entering it.

In addition to the stream flow diversion around the in-stream project area, a small dewatering basin within the work area will be dug. A sump pump of adequate capacity will be placed at the bottom of the basin to remove subsurface creek flow and keep the work area dry. The pump will be screened in accordance with *Juvenile Fish Screen Criteria for Pump Intakes* developed by (NMFS 1997) and will consist of 3/32-inch screen mesh. The water removed from the basin will be sent to a stilling basin, tank, or other approved device for final clarification prior to being

returned to the creek. All silt, sand, and fines removed in the clarification process will be used in the restoration.

A NMFS-authorized biologist will be on site to oversee installation and decommissioning of the water diversion structures and to conduct aquatic species rescue in the in-stream project reach (see *Qualified Biologist* paragraph below). Coffer dams and temporary water diversions will meet all permit requirements. The stream will be returned to its natural flow and bed condition upon project completion.

Throughout project construction, a qualified biologist will make frequent visits to the project area to ensure that no aquatic animals or Ridgway's rails are being impacted by construction activities. The biologist will also monitor to ensure water quality standards are being met and sediment is not entering the watercourse.

Protection of Aquatic Species

To avoid impacts to aquatic species (i.e., steelhead trout, other resident fish), surveys and relocation activities by a qualified biologist will be conducted to avoid disturbance to these species prior to commencing project construction. If found, all species will be relocated as described below in *Procedures for Removing Fish and Other Aquatic Specie*s. The in-stream project area will also be swept by the qualified biologist periodically during construction to ensure no animals have moved into the area. In addition, proper erosion control and other water quality Best Management Practices (BMPs) will be implemented to avoid sedimentation and disturbance into the creek.

Immediately prior to beginning construction work, a qualified biologist will determine if any fish are present in the project vicinity. An assessment of the site will be fashioned after protocols described in the *California Salmonid Stream Habitat Restoration Manual* (CDFW 2009). The survey will be done at a low tide when the water is very shallow in the project area.

If prior to construction no fish are detected, no additional fish protection measures will be implemented. A qualified biologist will also survey the site periodically during the construction process to ensure fish have not moved into the project area. If fish are observed after construction commences, work shall stop and appropriate actions taken to safely remove them.

Fish Capture and Relocation: If in-channel work requires dewatering, including for sediment-removal maintenance activities, fish shall be captured and relocated upstream of the project areas to avoid injury and mortality and minimize disturbance. The District shall implement the measures below or whatever more stringent species-preservation and avoidance measures are imposed by resource agencies, including NMFS and CDFW, with jurisdiction over aquatic special-status species:

1. The name(s) and credentials of qualified biologist(s) to act as construction monitors shall be submitted to CDFW and NMFS for approval at least 15 days before construction work begins.
2. Prior to and during the initiation of construction activities, a qualified fisheries biologist (i.e., approved by CDFW and/or NMFS) shall be present during installation and removal of creek-diversion structures.
3. For sites that require flow diversion and exclusion, the work area shall be blocked by placing fine-meshed nets or screens above and below the work area to prevent salmonids from re-entering the work area. To minimize the potential for re-entry, mesh diameter shall not exceed 1/8 inch. The bottom edge of the net or screen shall be secured to the channel bed to prevent fish from passing under the screen. Exclusion screening shall be placed in low-velocity areas to minimize fish impingement against the mesh. Screens shall be checked periodically and cleaned of debris to permit free flow of water.
4. Before removal and relocation on individual fish begins, a qualified fisheries biologist shall identify the most appropriate release location(s). In general, release locations should have water temperatures similar to (<3.6 degrees Fahrenheit difference) the capture location and offer ample habitat (e.g., depth, velocity, cover, connectivity) for released fish and should be selected to minimize the likelihood of reentering the work area or becoming impinged on exclusion nets or screens.
5. The means of capture shall depend on the nature of the work site and shall be selected by a qualified fisheries biologist as authorized by CDFW and NMFS. Complex stream habitat may require the use of electrofishing equipment, whereas in outlet pools, fish and other aquatic species may be captured by pumping down the pool and then seining or dip netting.
6. Initial fish relocation efforts shall be performed several days prior to the scheduled start of construction and continue through cofferdam installation and work-area dewatering activities.
7. Flow diversions and species relocation shall be performed during morning periods. The fisheries biologist shall survey the exclusion screening throughout the diversion effort to verify that no special-status fish, amphibians, or aquatic invertebrates are present. Afternoon pumping activities shall be limited, and pumping shall be suspended when water temperatures exceed 18 degrees Celsius. Water temperatures shall be measured periodically, and flow diversion and species relocation shall be suspended if temperatures exceed the 18-degree limit under NMFS guidelines. Handling of fish shall be minimized. When handling is necessary, personnel shall wet hands or nets before touching them.
8. Prior to translocation, fish that are collected during surveys shall be temporarily held in cool, aerated, shaded water using a five-gallon container with a lid. Overcrowding in containers shall be avoided; at least two containers shall be used, and no more than 25 fish shall be kept in each bucket. Aeration shall be provided with a battery-powered external bubbler. Fish shall be protected from jostling and noise and shall not be removed from the container until the time of release. A thermometer shall be placed in

each holding container, and partial water changes shall be conducted as necessary to maintain a stable water temperature. Special-status fish shall not be held more than 30 minutes.

9. If fish are abundant, capture shall cease periodically to allow release and minimize the time fish spend in holding containers.
10. Fish shall not be anesthetized or measured. However, they shall be visually identified to species level, and year classes shall be estimated and recorded.
11. Reports on fish-relocation activities shall be submitted to CDFW and NMFS in within two weeks following completion of in-channel operations.

Qualified Biologist

For the purposes of the Lower COM Corte Madera Creek Restoration Project:

- A person holding a valid collector's permit for all salmonid species subject to take from NMFS and CDFW; or
- A person with a bachelors or higher degree in fisheries biology, wildlife biology, marine biology, aquatic biology, hydrology, wetland ecology or equivalent other course of study; and 5 or more years of professional experience in fisheries research, management, and/or habitat restoration; and direct participation in 5 or more fish capture and transport events. The name(s) and credentials of qualified biologist(s) to act as construction monitors shall be submitted to CDFW and NMFS for approval at least 15 days before construction work begins.

References Cited

CDFW 2009
California Department of Fish and Wildlife. 2009. *California Salmonid Stream Habitat Restoration Manual*.

NMFS 1997
National Marine Fisheries Service. 1997. *Fish Screening Criteria for Anadromous Salmonids*.

Appendix E

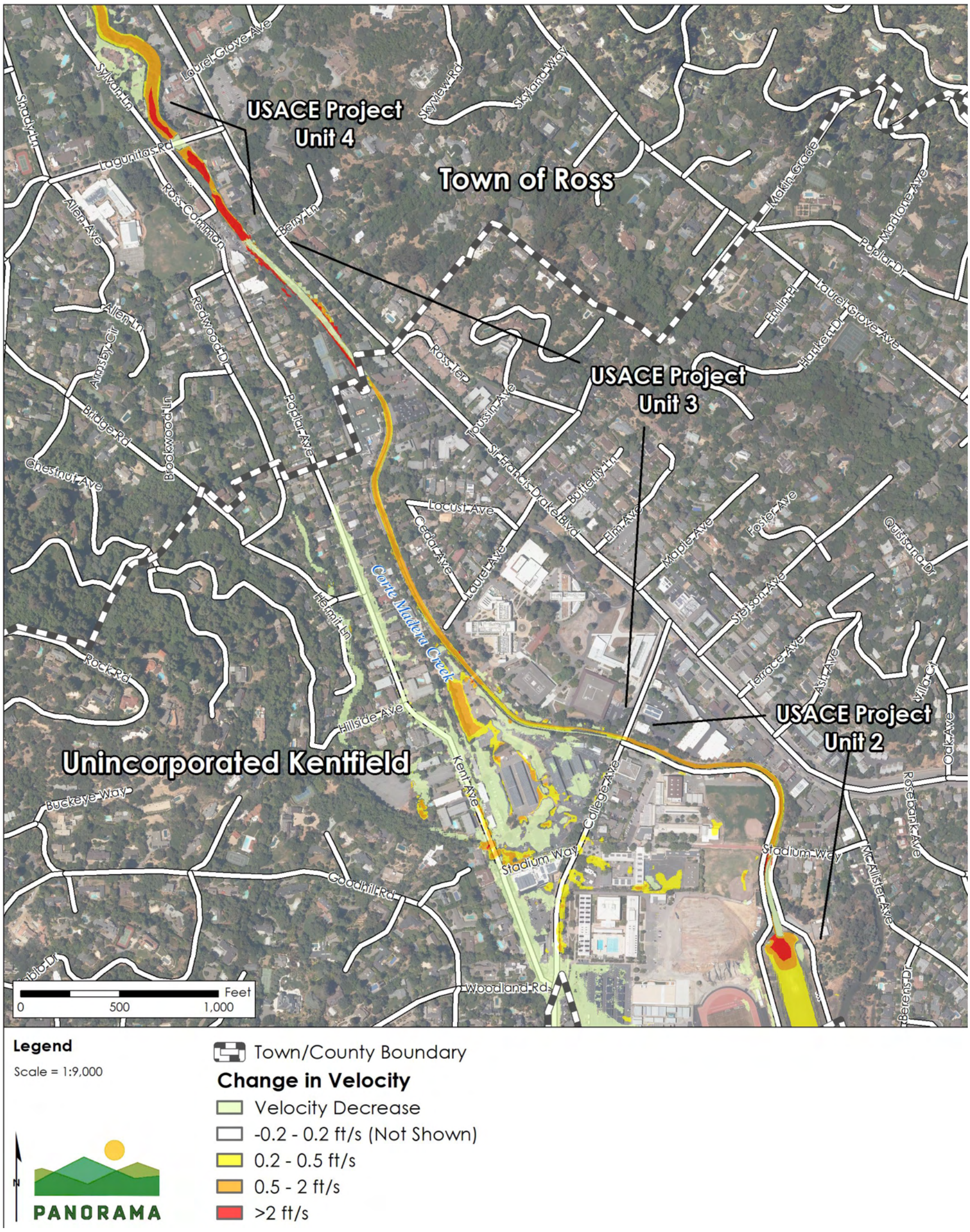
Supplemental Water Surface Elevation Change Maps

Supplemental Water Surface Elevation Maps

This appendix includes figures that supplement the analysis provided in Section 3.9 Hydrology and Water Quality. The figures show the project changes in velocity and model-predicted water surface elevation changes during 10-year, 25-year, and 100-year flood as follows:

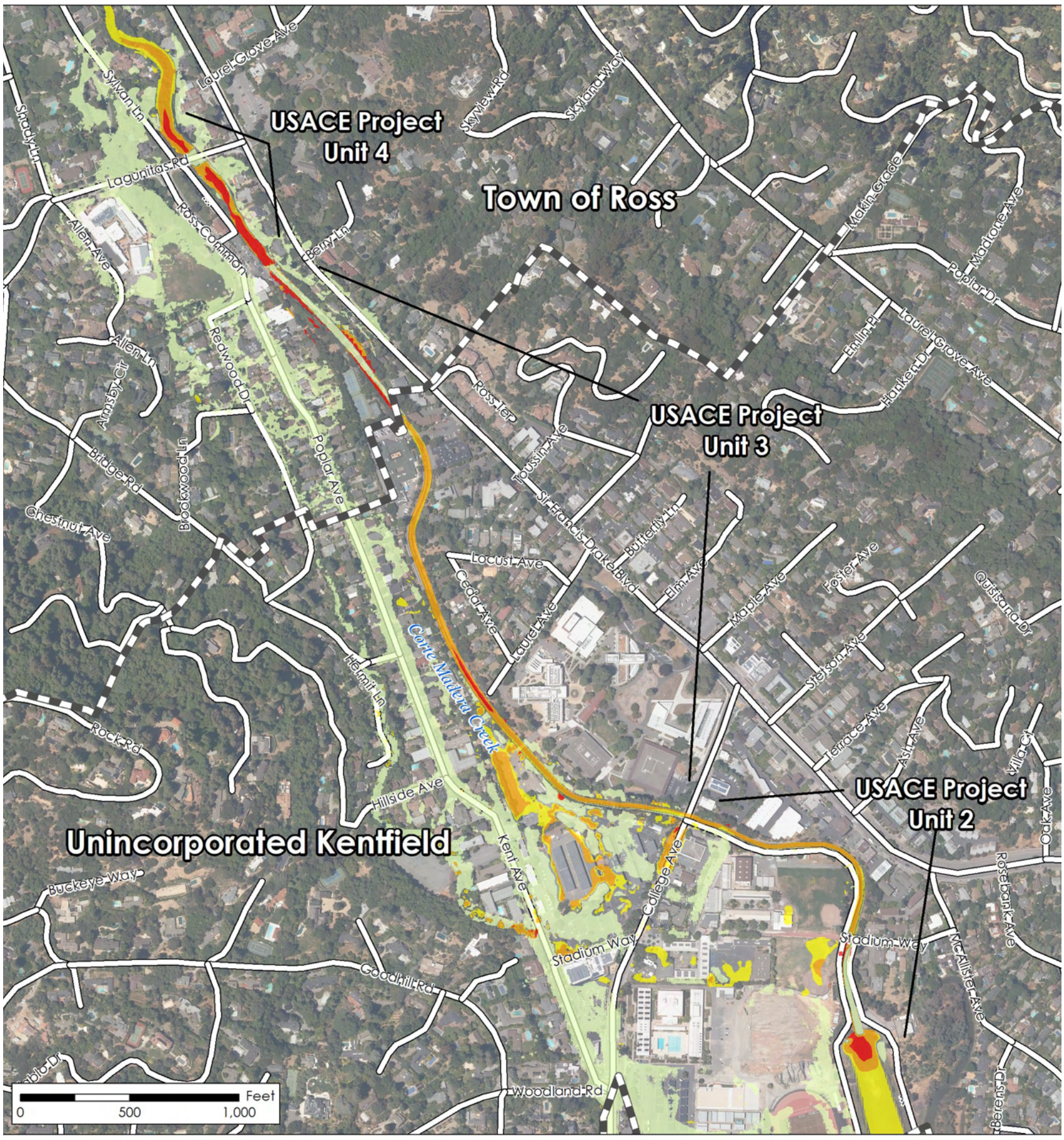
- Project changes in velocity during the 10-year, 25-year, and 100-year flood events under existing conditions (Figure E-1 to Figure E-3)
- Water surface elevation changes during the 10- year, 25-year, and 100-year flood events under existing conditions (Figure E-4 to Figure E-6)
- Model predicted water surface elevations for the existing condition without project and existing condition with project during the 10-year, 25-year, and 100-year flood events (Figure E-7 to Figure E-12)
- Model predicted water surface elevations for the future condition without project and the future condition with project during the 10-year, 25-year, and 100-year flood events (Figure E-13 to Figure E-18)

Figure E-1 Project Changes in Velocity from Existing Conditions, 10-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E-2 Project Changes in Velocity from Existing Conditions, 25-Year Flood Event



Legend

Scale = 1:9,000

Town/County Boundary

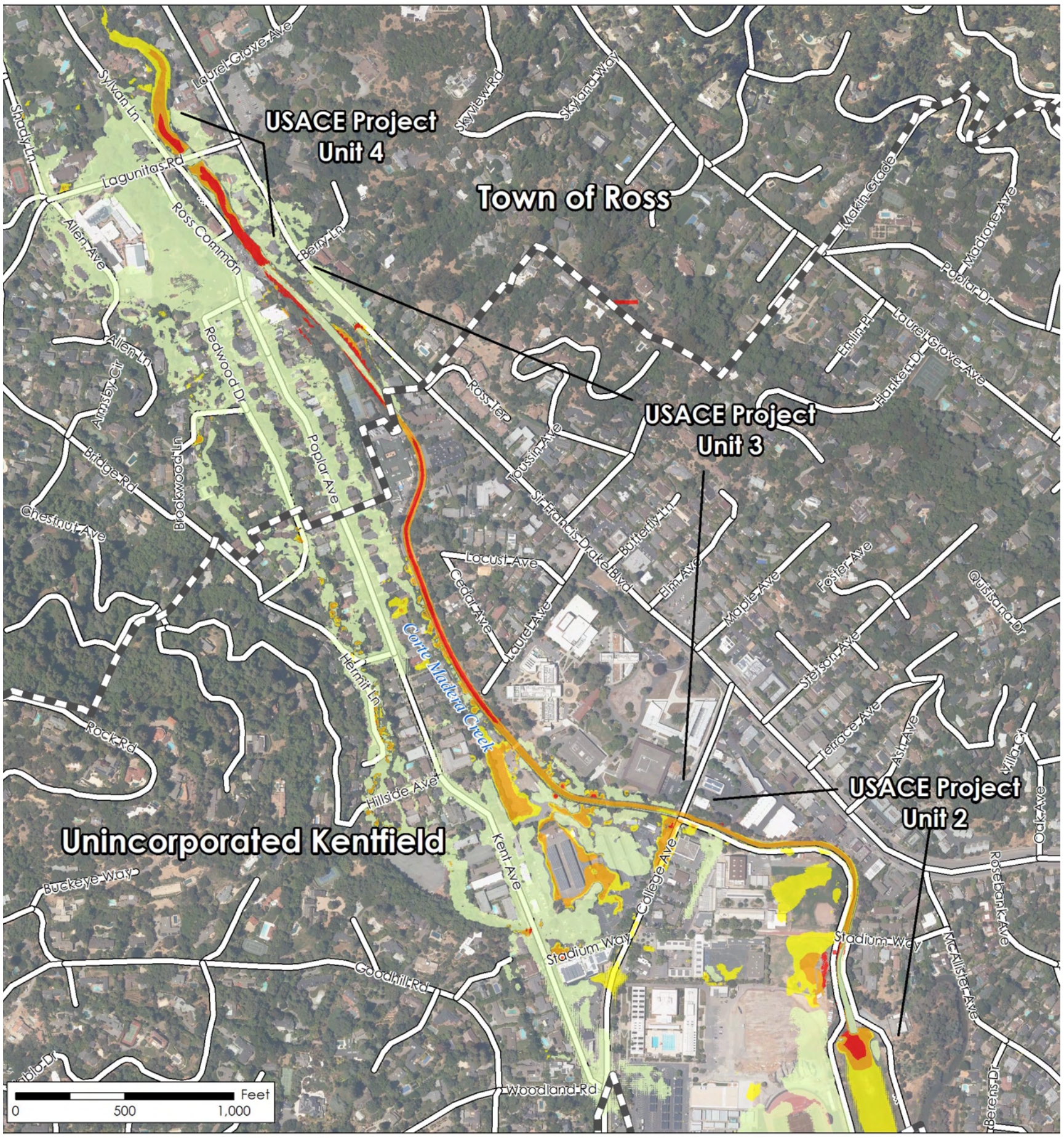
Change in Velocity

- Velocity Decrease
- -0.2 - 0.2 ft/s (Not Shown)
- 0.2 - 0.5 ft/s
- 0.5 - 2 ft/s
- >2 ft/s

PANORAMA

Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E-3 Project Changes in Velocity from Existing Conditions, 100-Year Flood Event



Legend

Scale = 1:9,000

Town/County Boundary

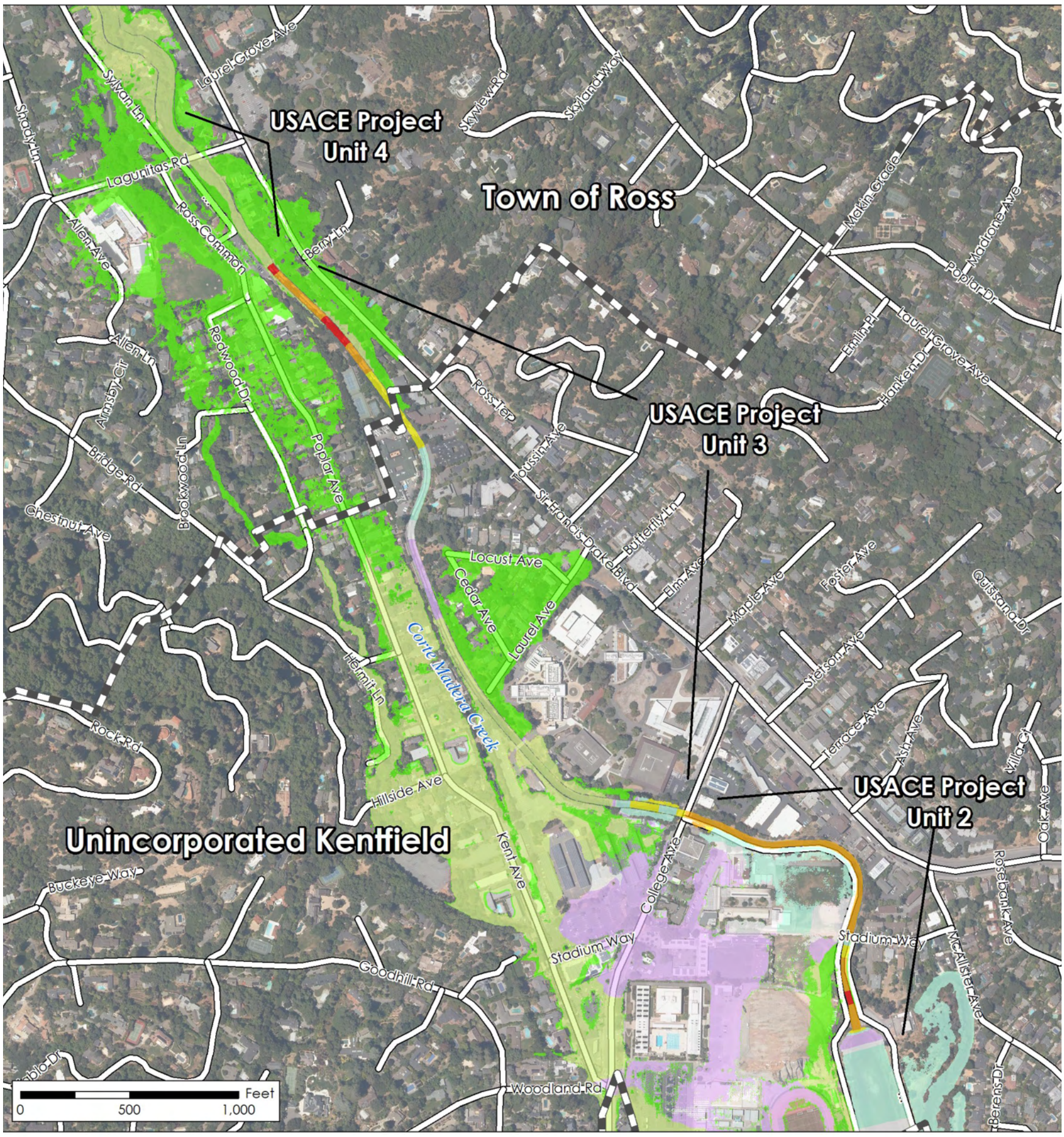
Change in Velocity

- Velocity Decrease
- -0.2 - 0.2 ft/s (Not Shown)
- 0.2 - 0.5 ft/s
- 0.5 - 2 ft/s
- >2 ft/s

PANORAMA

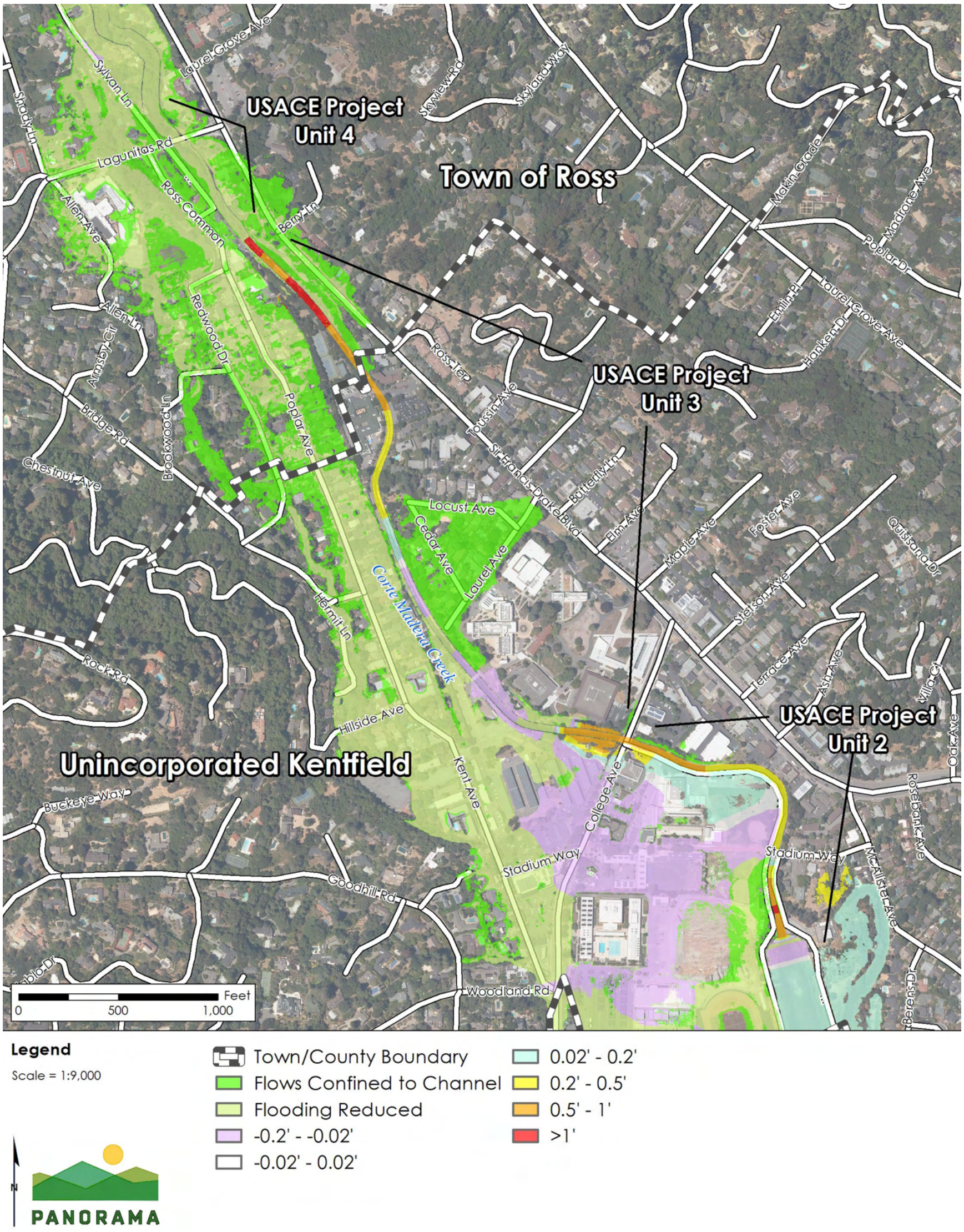
Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E-4 Project Changes in Water Surface Elevation from Existing Conditions, 10-Year Flood Event



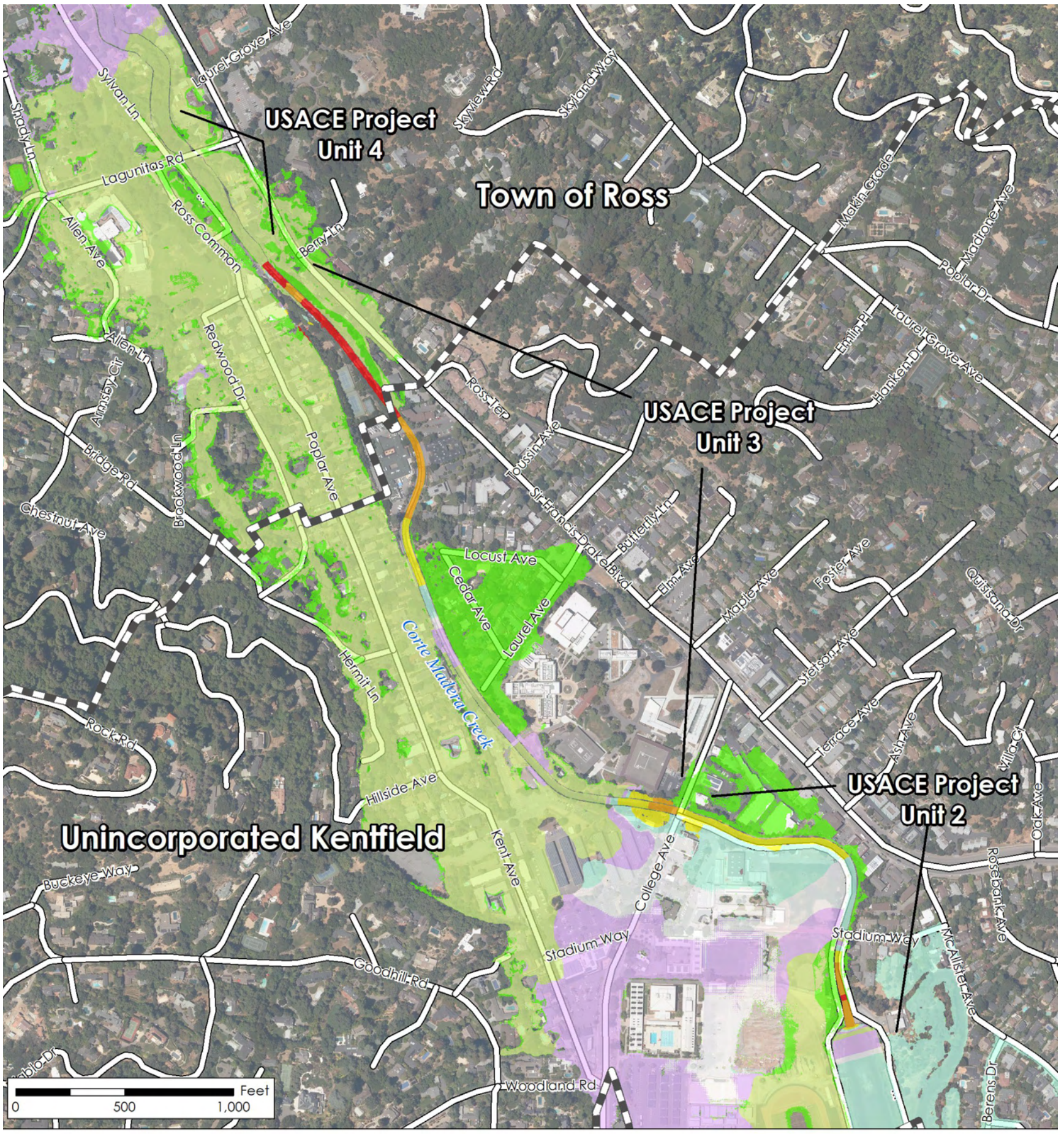
Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E-5 Project Changes in Water Surface Elevation from Existing Conditions, 25-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E- 6 Project Changes in Water Surface Elevation from Existing Conditions, 100-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E-7 Water Surface Elevation, Existing Condition Without Project, 10-Year Flood Event

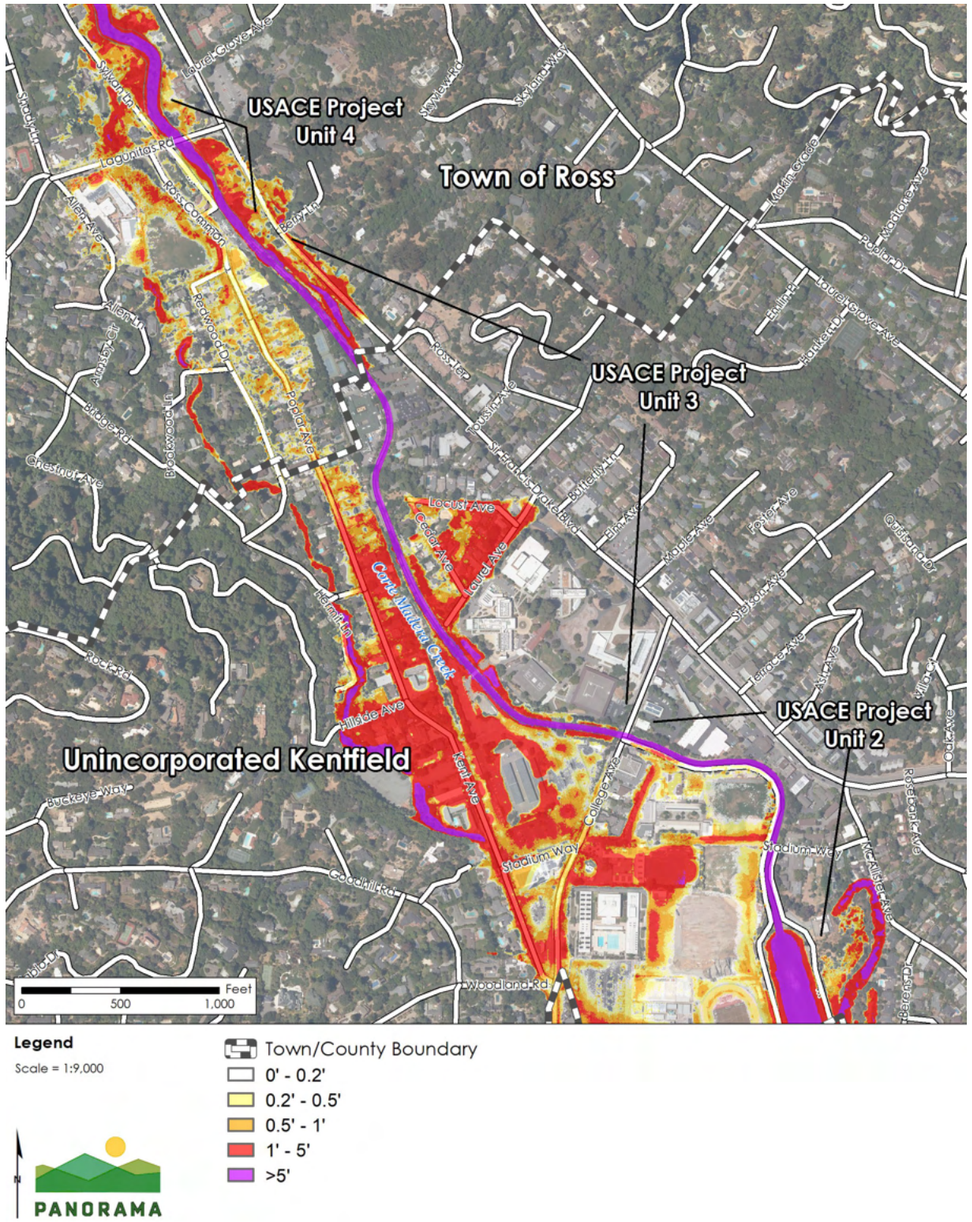
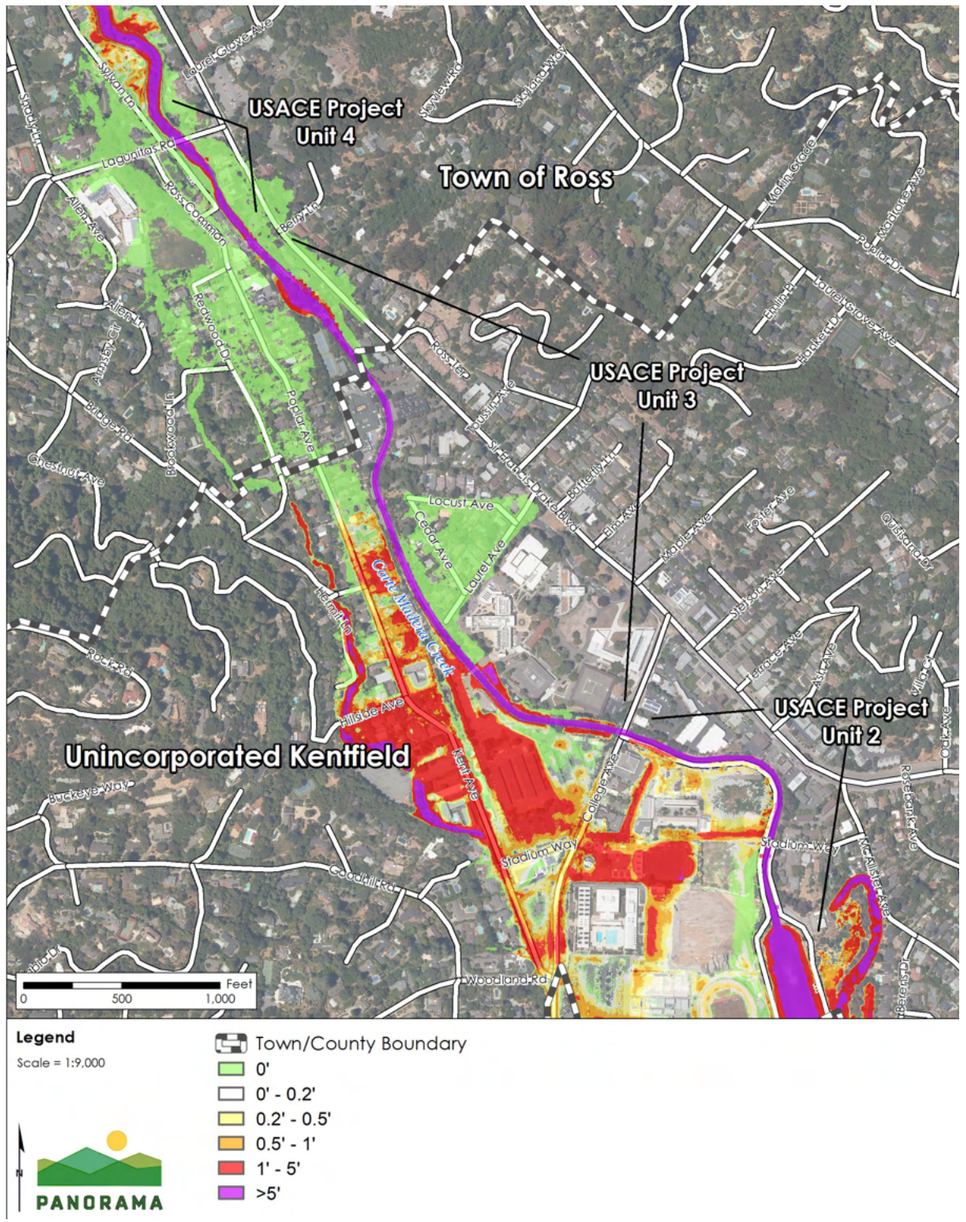


Figure E-8 Water Surface Elevation, Existing Condition With Project, 10-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E-9 Water Surface Elevation, Existing Condition Without Project, 25-Year Flood Event

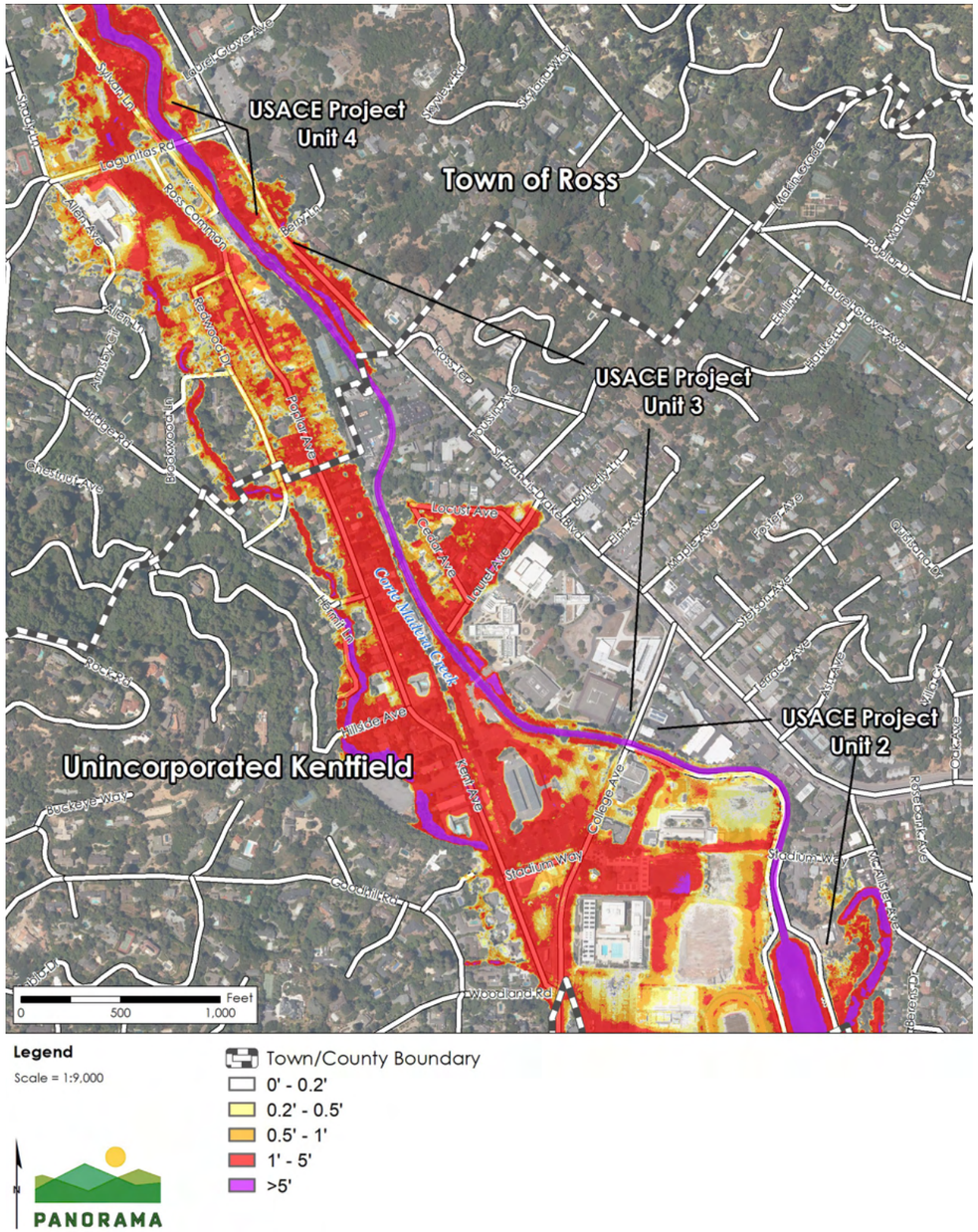
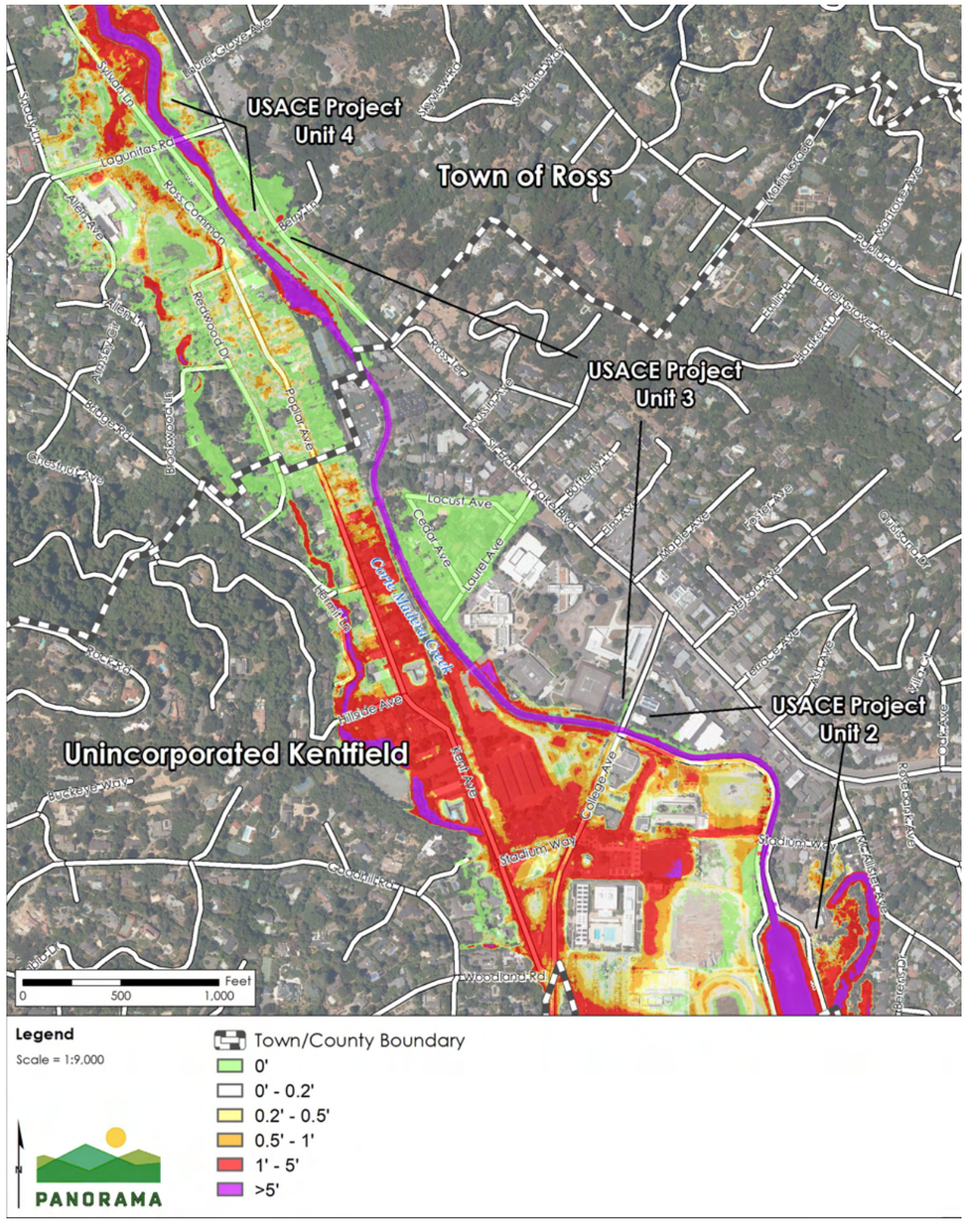


Figure E-10 Water Surface Elevation, Existing Condition With Project, 25-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E-11 Water Surface Elevation, Existing Condition Without Project, 100-Year Flood Event

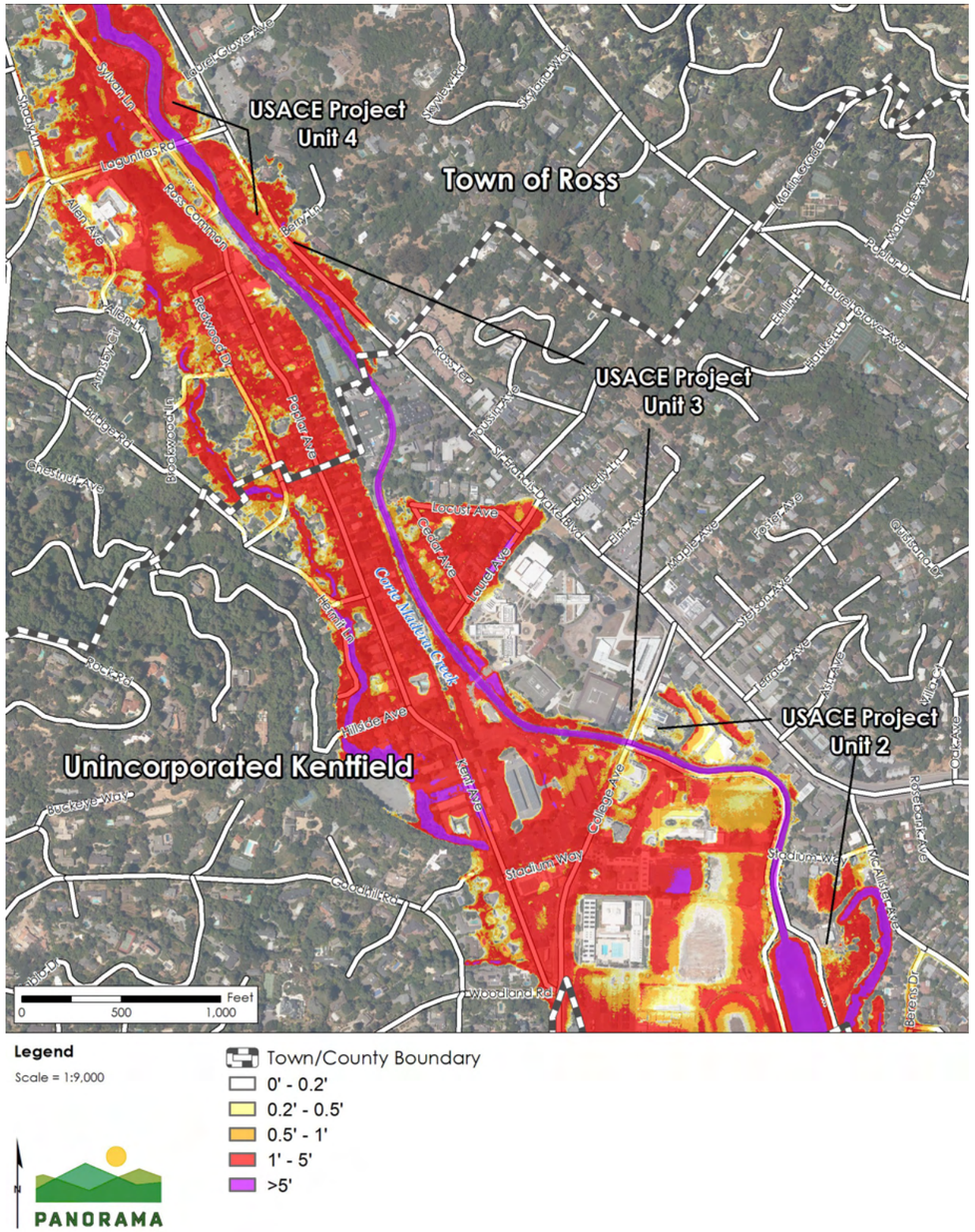
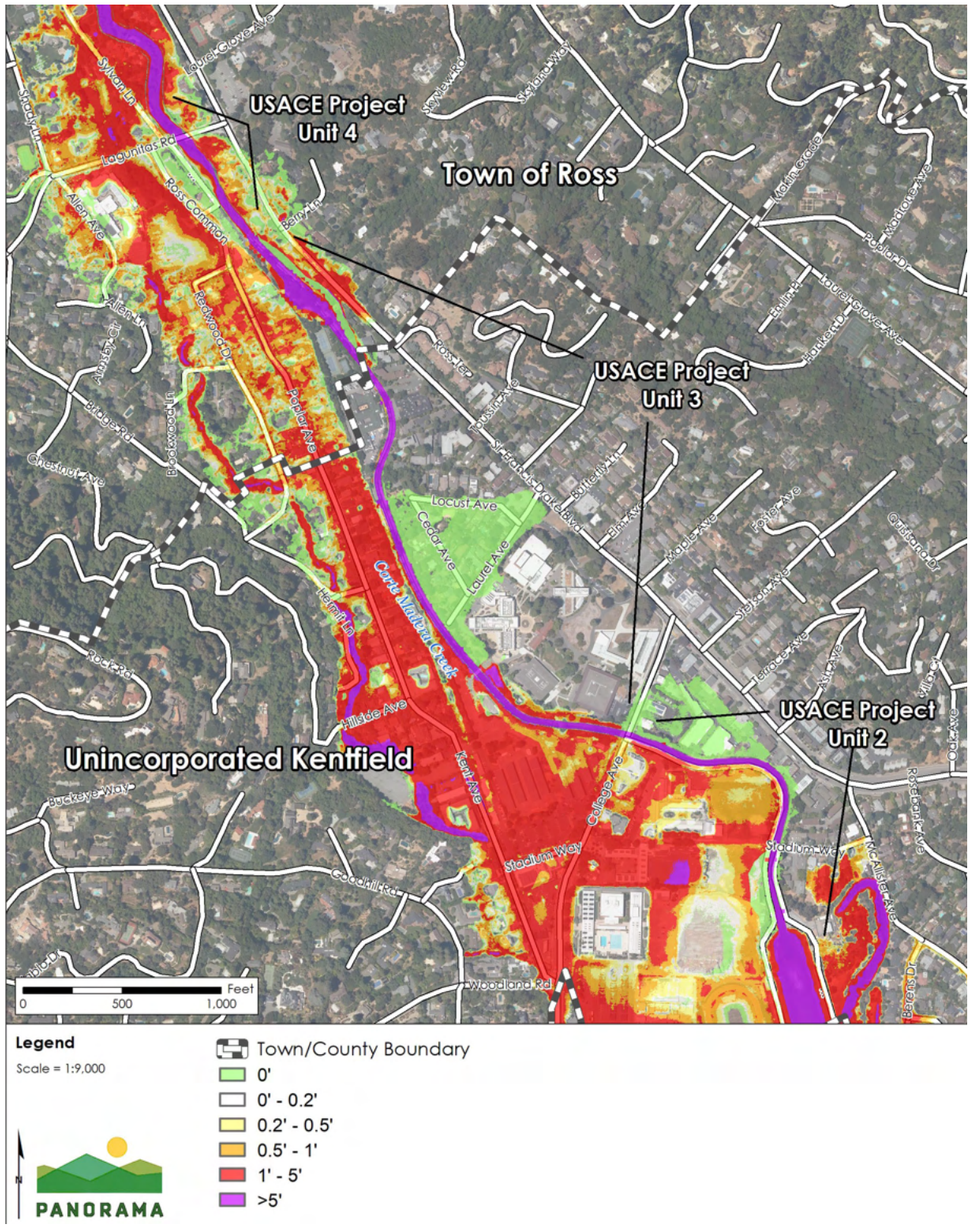


Figure E-12 Water Surface Elevation, Existing Condition With Project, 100-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E-13 Water Surface Elevation, Future Condition Without Project, 10-Year Flood Event

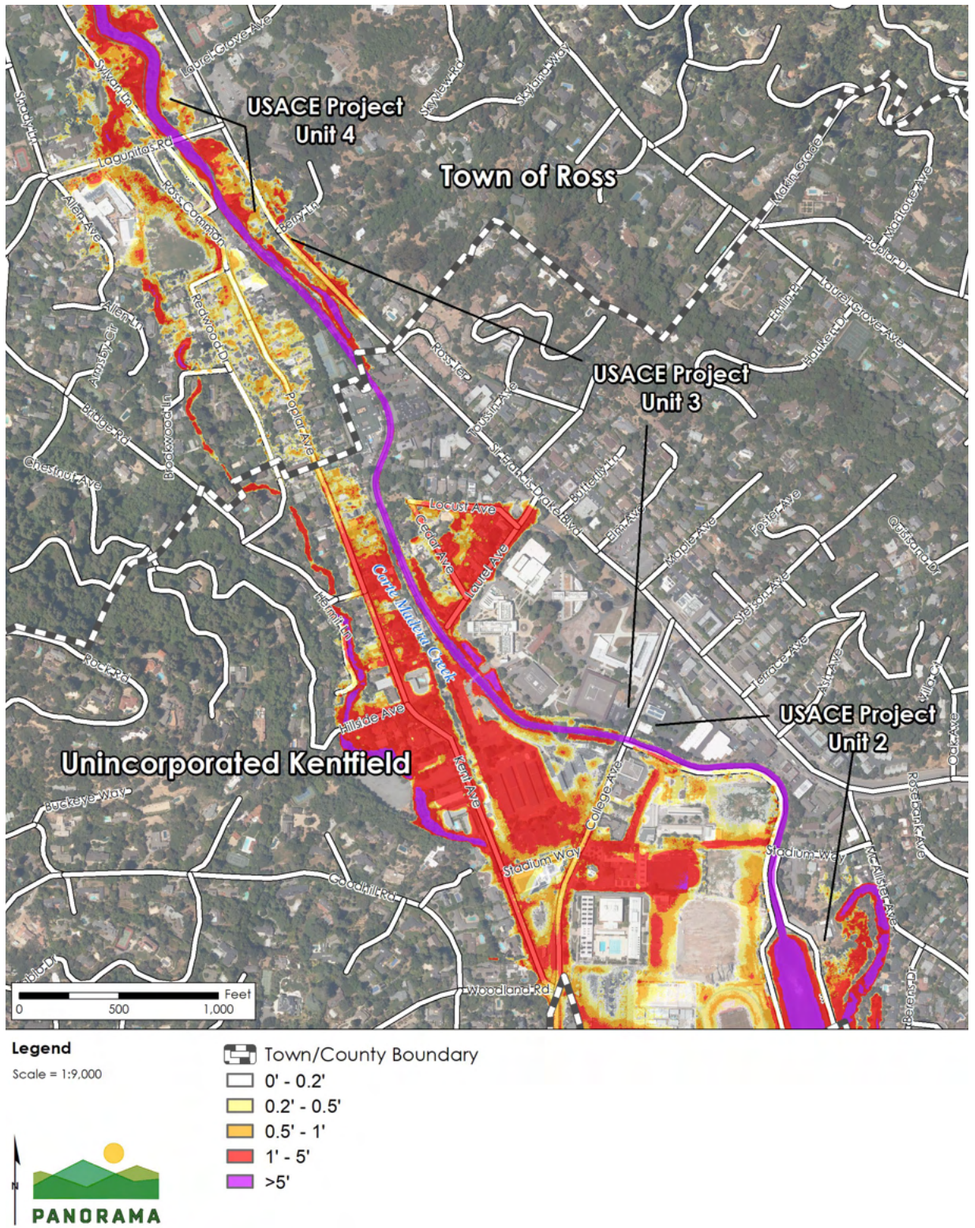
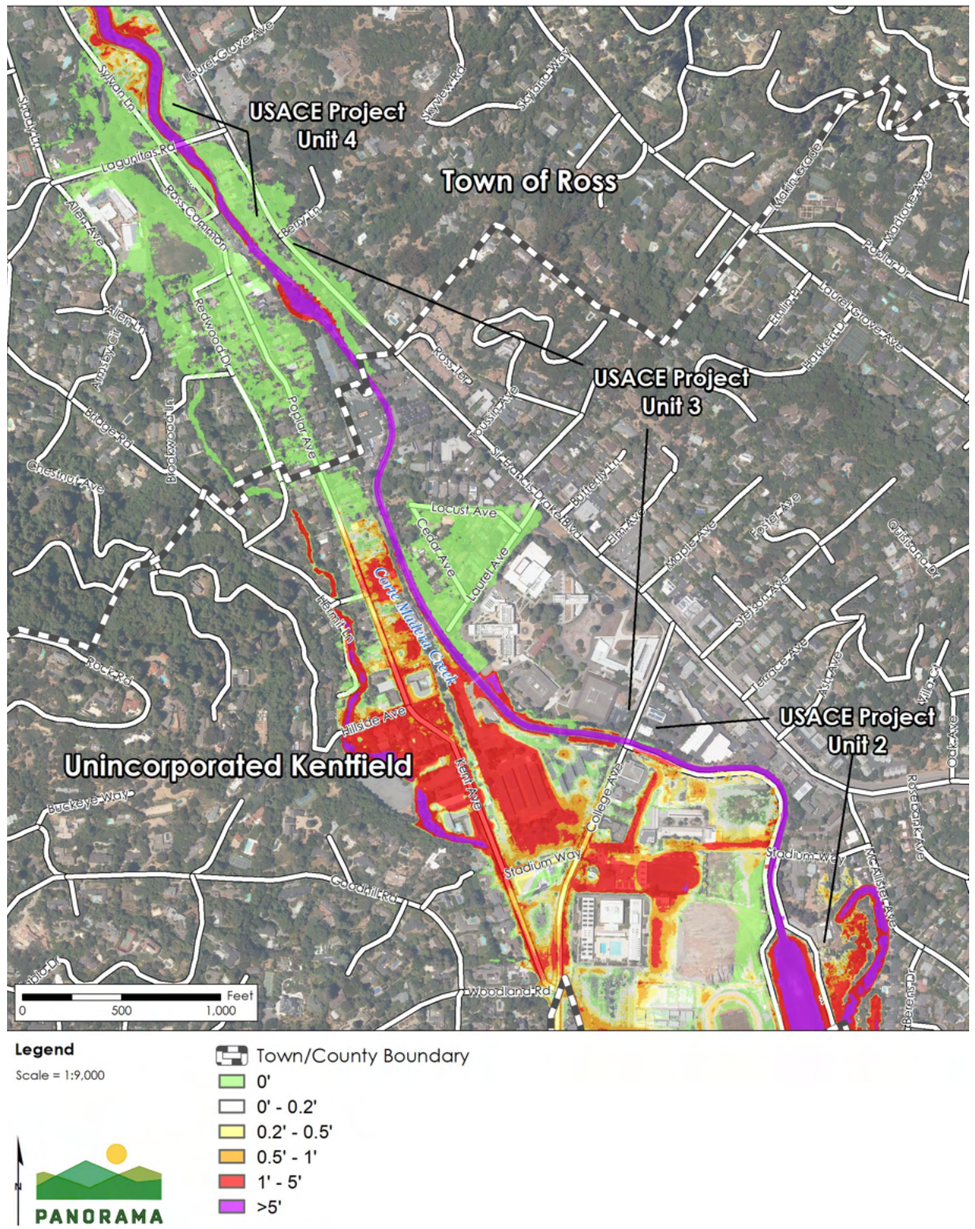


Figure E-14 Water Surface Elevation, Future Condition With Project, 10-Year Flood Event



Legend
Scale = 1:9,000

- Town/County Boundary
- 0' - 0.2'
- 0.2' - 0.5'
- 0.5' - 1'
- 1' - 5'
- >5'

PANORAMA

Legend
Scale = 1:9,000

- Town/County Boundary
- 0'
- 0' - 0.2'
- 0.2' - 0.5'
- 0.5' - 1'
- 1' - 5'
- >5'

PANORAMA

Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure E-15 Water Surface Elevation, Future Condition Without Project, 25-Year Flood Event

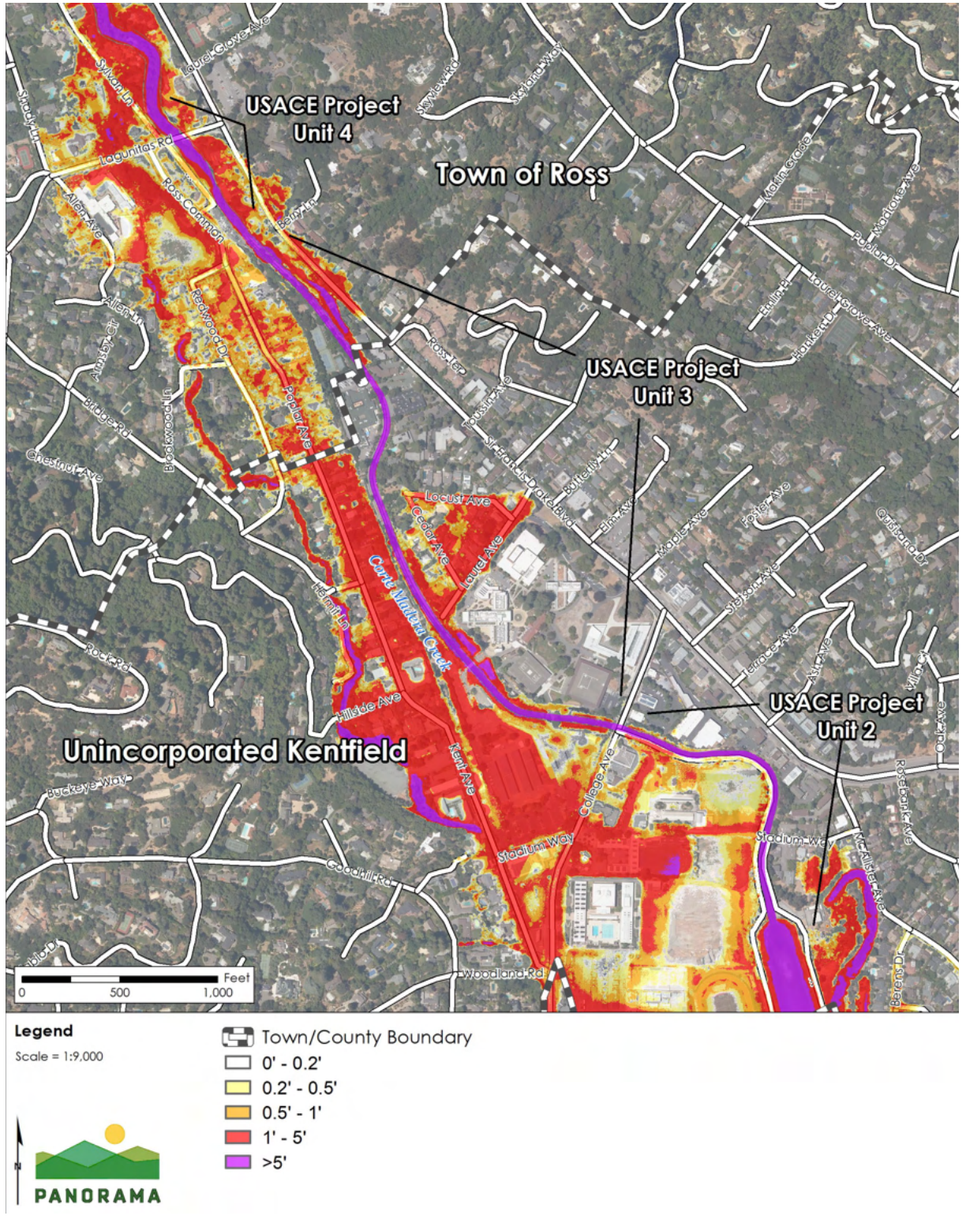

USACE Project Unit 4
Town of Ross
USACE Project Unit 3
USACE Project Unit 2
Unincorporated Kentfield
Corte Madera Creek
Laguntas Rd
Ross Common
Redwood Dr
Poplar Ave
Locust Ave
Cedar Ave
Laurel Ave
Hillside Ave
Kent Ave
College Ave
Stadium Way
Woodland Rd
Sylvan Ln
Laurel Grove Ave
Allen Ave
Bella Vista Ave
Madrona Ave
Butterfield Rd
Chestnut Ave
Maple Ave
Foster Ave
Crittenden Dr
Buckeye Way
Goodhill Rd
Eliseo Dr
Kentfield Gardens
Kentfield Plaza
Kentfield Shopping Center
Kentfield Rehabilitation Hospital
Kentfield Elementary School
Kent Woodlands
Kent Middle School
Kentfield Fire Department
Kentfield Public Works
Kentfield Corporation Yard
Kentfield Planning Department
Kentfield Police Department

Figure E-17 Water Surface Elevation, Future Condition Without Project, 100-Year Flood Event

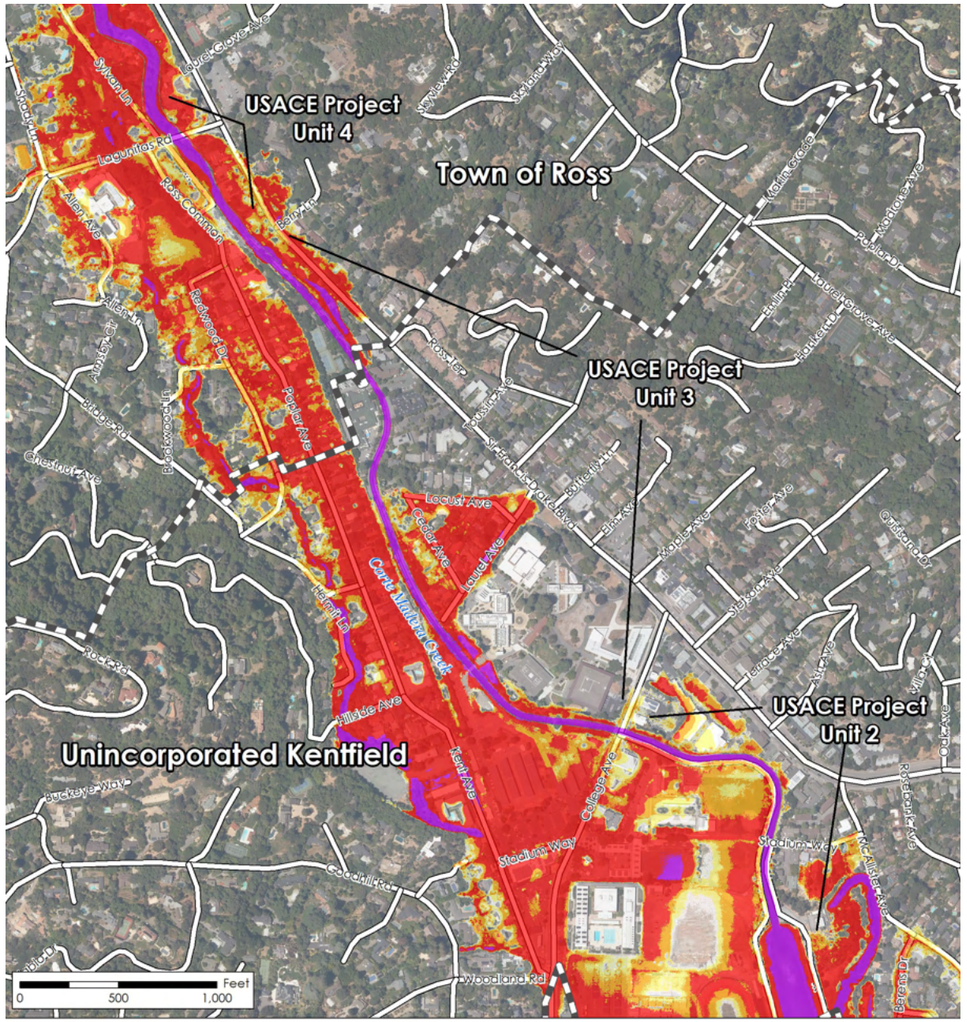
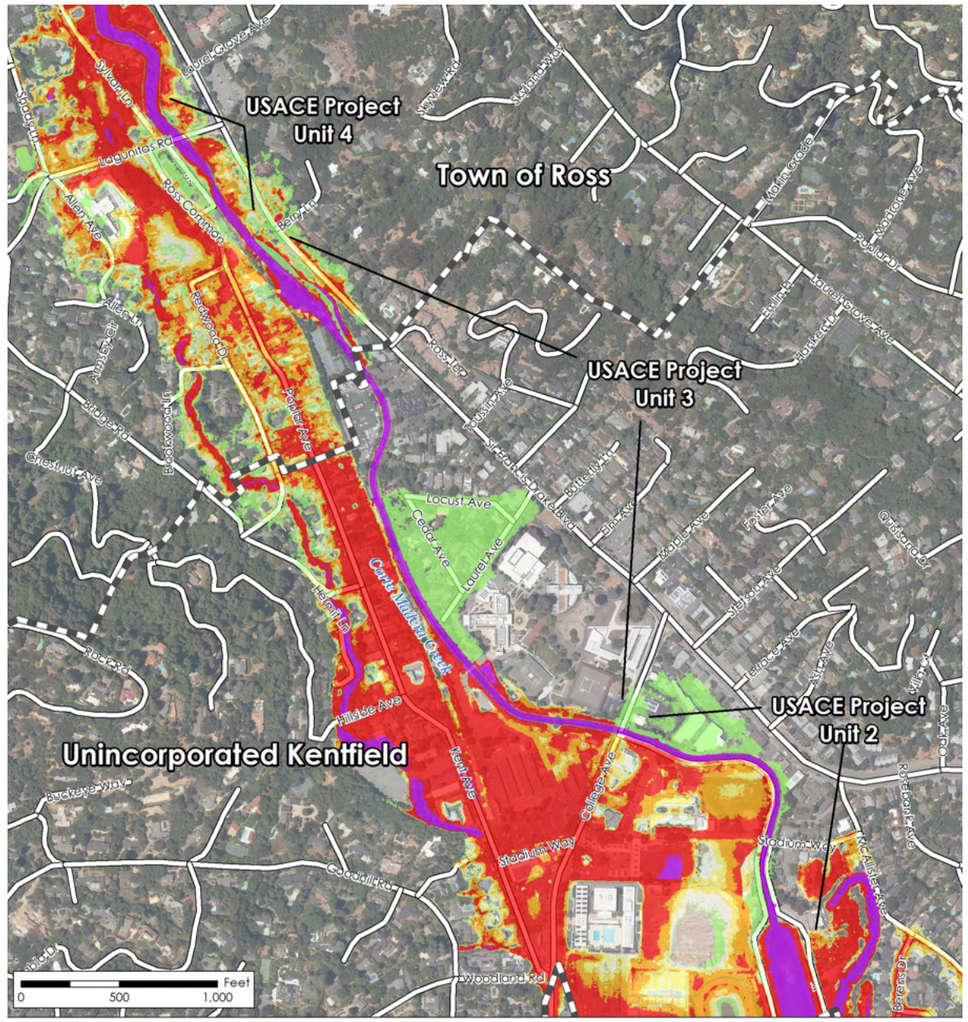


Figure E-18 Water Surface Elevation, Future Condition With Project, 100-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

References

Bay Area Open Space Council. (2011, May). Bay Area Cities GIS dataset. *San Francisco Bay Area Upland Habitat Goals Project*. GreenInfo Network.

GHD. (2020, October 23). Scenario B2 Hydraulic Modeling.

Tele Atlas North America, Inc. (2020). U.S. and Canada Detailed Streets GIS dataset. *ESRI® Data & Maps: StreetMap™*. ESRI.

Town of Ross. (2007, June). Town of Ross General Plan.

U.S. Geological Survey. (2016). National Hydrography Dataset Waterbodies GIS dataset.

US Geological Survey. (2013). USGS NED 1/3 Arc Second DEM Raster dataset.

Appendix F

Tribal Consultation Supporting Information

Corte Madera Creek Flood Risk Management Project
AB 52 Coordination Tracking Sheet

Tribe	Name	Address	Contact Information	Notification Letter Mailed	Letter Receipt Date	Tribe 30-Day Reply	Designated Tribal POC	Contact Information	Agency 30-Day Reply	Follow-up/Comments
Federated Indians of Graton Rancheria	Buffy McQuillen Tribal Heritage Preservation Officer	6400 Redwood Drive, Suite 300 Rohnert Park, CA 94928	THPO@gratonrancheria.com Office: 707.566.2288; ext. 137 Cell: 707.318.0485	June 23, 2020 August 5, 2020 – email follow up	June 26, 2020	August 6, 2020 via emailed letter	Buffy McQuillen Tribal Heritage Preservation Officer (THPO)	THPO@gratonrancheria.com Office: 707.566.2288; ext. 137 Cell: 707.318.0485	August 21, 2020, via email	**August 6, 2020:** FIGR emailed letter to County requesting consultation. **August 21, 2020:** Email reply to FIGR letter **October 21, 2020**: County email follow-up to August 21 email **December 3, 2020:** County email to FIGR requesting comment by January 1, 2021 or consultation will be considered complete. **December 8, 2020:** Email from FIGR, accepting mitigation measures and ending consultation.
Ione Band of Miwok Indians	Sara D. Setshwaelo, Chairperson	P.O. Box 699 9252 Bush Street, Suite 2 Plymouth, CA 95669	sara@ionemiwok.net	June 23, 2020 August 5, 2020 – email follow up	June 25, 2020					No responses

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Corte Madera Creek Flood Risk Management Project

County: Marin

USGS Quadrangle Name: San Rafael 7.5-minute

Township: 2 N, 1 N **Range:** 6 W **Section(s):** 31; 5, 6

Company/Firm/Agency: Janis Offermann/Horizon Water and Environment

Street Address: 400 Capitol Mall, Suite 2500

City: Sacramento **Zip:** 95814

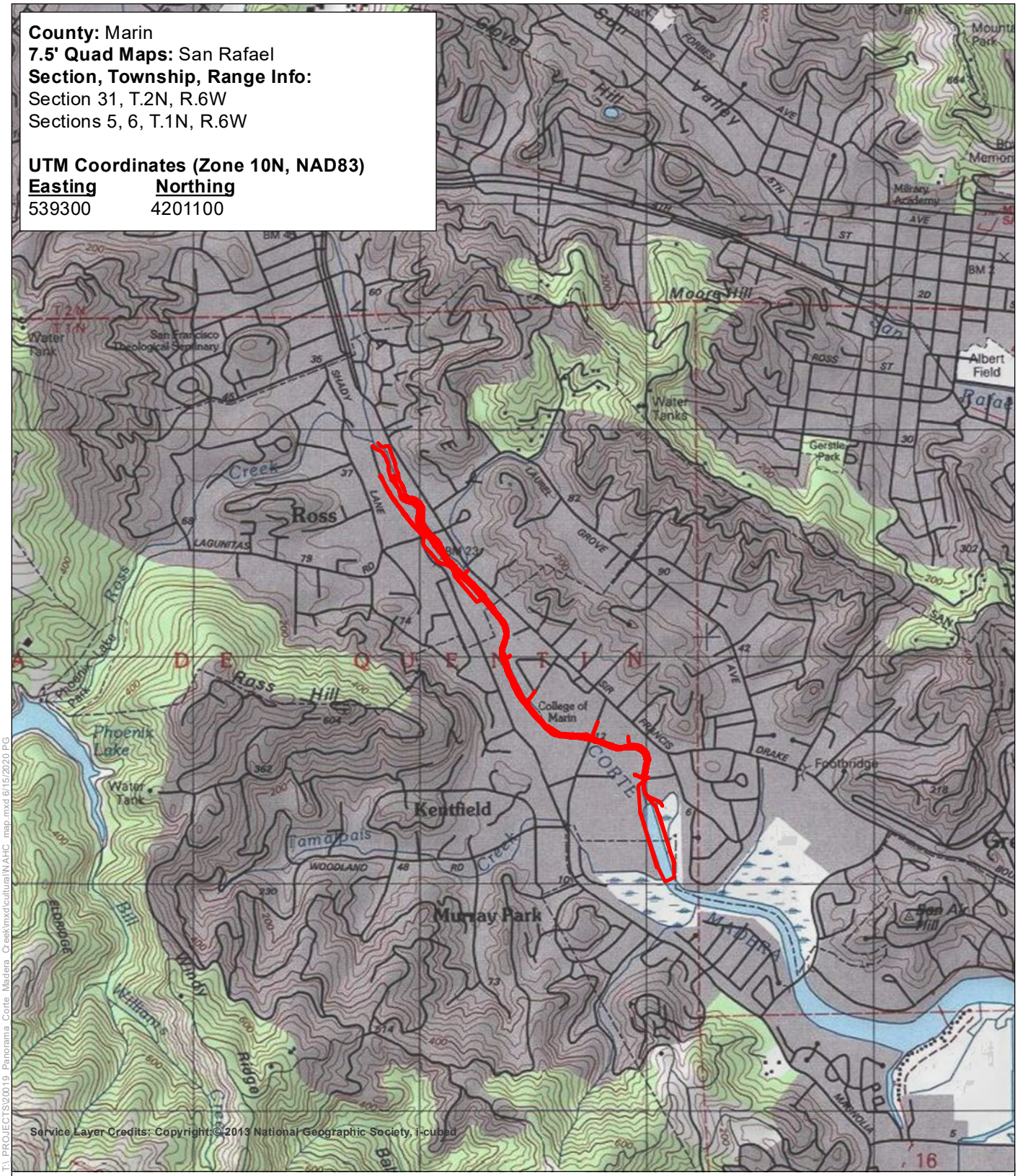
Phone: 530-220-4918

Fax:

Email: janis@horizonh2o.com

Project Description:

The project proposes to restore and improve portions of Corte Madera Creek, including removal of a fish ladder, in order to enhance habitat for salman spawning in the creek.



T:_PROJECTS\2019_Panorama_Corte_Madera_Creek\mxd\cultural\NAHC_map.mxd 6/15/2020 PG

Project Area

N

0 0.125 0.25 0.5 Miles

Project Area

Horizon WATER and ENVIRONMENT

Marin County Flood Control and Water Conservation District
Corte Madera Creek Flood Risk Management Project, Phase 1

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
Merri Lopez-Keifer
Luiseño

PARLIAMENTARIAN
Russell Attebery
Karuk

COMMISSIONER
Marshall McKay
Wintun

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Julie Tumamait-Stenslie
Chumash

COMMISSIONER
[**Vacant**]

COMMISSIONER
[**Vacant**]

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

June 16, 2020

Janice Offerman, Cultural Resources Practice Leader
Horizon Water and Environment

Via Email to: janis@horizonh2o.com

Re: Corte Madera Creek Flood Risk Management Project, Marin County

Dear Ms. Offerman:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Sarah.Fonseca@nahc.ca.gov.

Sincerely,

Sarah Fonseca
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Marin County
6/16/2020

Federated Indians of Graton Rancheria
Greg Sarris, Chairperson
6400 Redwood Drive, Ste 300 — Coast Miwok
Rohnert Park, CA, 94928 — Pomo
Phone: (707) 566 - 2288
Fax: (707) 566-2291
gbuvelot@gratonrancheria.com

Guidiville Indian Rancheria
Merlene Sanchez, Chairperson
P.O. Box 339 — Pomo
Talmage, CA, 95481
Phone: (707) 462 - 3682
Fax: (707) 462-9183
admin@guidiville.net

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Corte Madera Creek Flood Risk Management Project, Marin County.

COUNTY OF MARIN

DEPARTMENT OF PUBLIC WORKS

Quality, Excellence, Innovation

Raul M. Rojas
DIRECTOR

Administration
PO Box 4186
San Rafael, CA 94913-4186
415 473 6528 T
415 473 3799 F
415 473 3232 TTY
CRS Dial 711
www.marincounty.org/pw

Accounting

Airport

Building Maintenance

Capital Projects

Certified Unified Program Agency (CUPA)

Communications Maintenance

County Garage

Disability Access

Engineering & Survey

Flood Control & Water Resources

Land Development

Purchasing

Real Estate

Reprographic Services

Road Maintenance

Stormwater Program

Transportation & Traffic Operations

Waste Management

June 23, 2020

Buffy McQuillen
Tribal Heritage Preservation Officer
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: Tribal Cultural Resources under the California Environmental Quality Act, AB 52 (Gatto, 2014). Formal Notification of determination that a Project Application is Complete or Decision to Undertake a Project, and Notification of Consultation Opportunity, pursuant to Public Resources Code § 21080.3.1 (hereafter PRC).

Dear Ms. McQuillen,

In accordance with Public Resources Code Section 21080.3.1 and the request from the Federated Indians of Graton Rancheria (FIGR) in the letter dated July 1, 2015, this is to notify you that the County of Marin Flood Control and Water Conservation District is proposing a flood risk management project along Corte Madera Creek within the Town of Ross and unincorporated Kentfield areas of the County of Marin. The County will serve as the lead agency under the California Environmental Quality Act (CEQA). This notice has been sent via certified U.S. Mail.

Attached please find a description of the proposed project and a map showing the project location. Please note that in accordance with Public Resources Code Section 21080.3.1 subd. (b), FIGR has 30 days from receipt of this notice to request consultation.

Please feel free to contact me at JDixon@marincounty.org or (415) 473-7031 should you have any questions, or if you would like to schedule a meeting. If you are interested in scheduling a meeting to discuss this project, following receipt of your response, we will send you a list of potential meeting dates and times.

Sincerely,

Joanna Dixon
Associate Civil Engineer

Attachments: Project Information Sheet
Project Location Map

Cc: Rachel Reid, Marin County Planning Department
Susanne Heim, Panorama Environmental, Inc.

Corte Madera Creek Flood Risk Management Project
Project Information Sheet

OVERVIEW

The Marin County Flood Control and Water Conservation District (District) proposes the Corte Madera Creek Flood Risk Management Project, Phase 1 (Project). Corte Madera Creek has flooded numerous times in the past 70 years resulting in loss of human life and significant property and infrastructure damage. Goals of the Project include protection of life and property from flooding and improved fish passage within Corte Madera Creek within Kentfield and the Town of Ross. The Project is funded through a combination of local funding and a grant from the California Department of Water Resources (DWR). The Project will be locally managed by the District, in partnership with the Town of Ross, Friends of Corte Madera Creek and other local stakeholders.

Project History

- 1960s–70s: USACE and the District began work on the Corte Madera Creek Flood Control Project; however, the project was not implemented due to litigation.
- 2015: USACE reinitiated study and design of the flood management project.
- 2018: USACE released a Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Corte Madera Creek Flood Risk Management Project.
- 2019: District and USACE worked together to terminate the joint effort in support of a locally-managed project

Previous Environmental Review

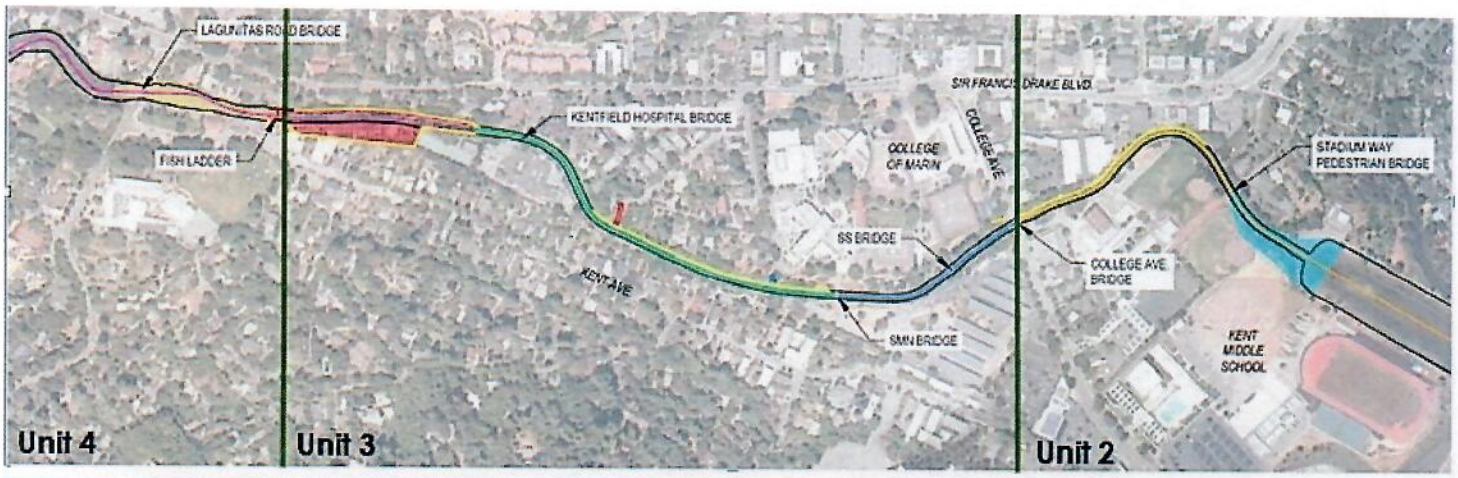
The USACE published a Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Project in 2018. Upon careful review of the public comments on the Draft EIS/EIR, the District recognized that additional analysis of the project alternatives would be necessary to ensure that public and agency comments were adequately addressed in compliance with the California Environmental Quality Act (CEQA). The District Board of Supervisor decided to terminate the agreement with the USACE as of December 31, 2019, and transition the Project to a locally-managed project.

Current District-Led Project

Under local leadership and management, the District plans to use public input, additional evaluation of the "Phase 1" components, and the completed 2018 Draft EIS/EIR to develop a redefined project concept that is reflective of local community priorities. The Project design will integrate multiple benefits including flood risk mitigation, ecosystem restoration, improved fish passage, and recreational enhancements.

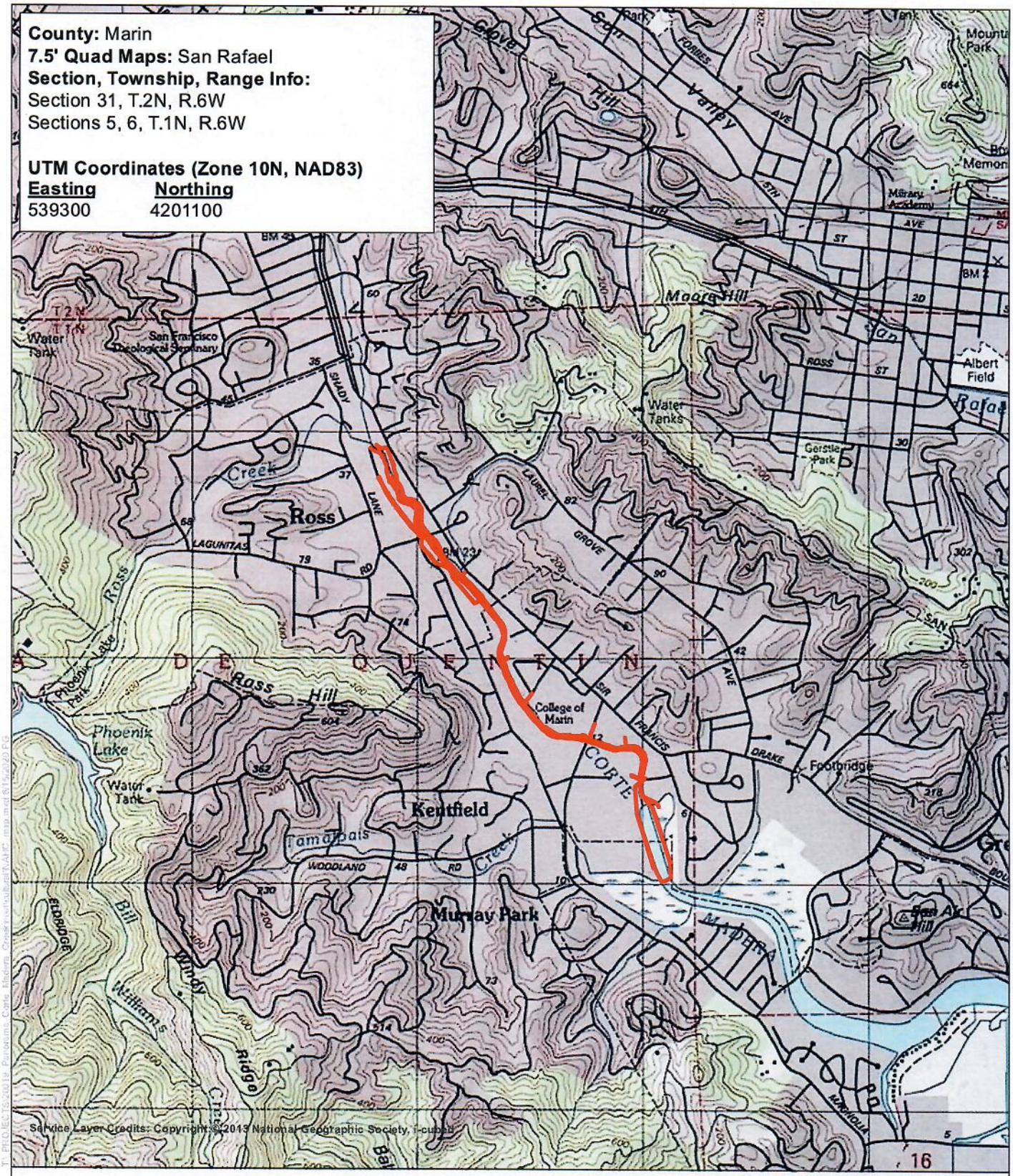
The Project will reduce the risk of flood damage in the Town of Ross and unincorporated Kentfield through Corte Madera Creek channel improvements and widening; removal of a USACE wooden fish ladder; removal of portions of the existing concrete channel; construction of new floodwalls; installation of a storm drain pump station; construction of improved fish pools; and natural channel restoration.

The current Project design does not include a bypass pipeline or closure of Sir Francis Drake Boulevard, which was previously a major area of public concern due to traffic impacts.



Project Elements by Unit

Unit	Project Elements
Unit 4	• **Fish Ladder Removal.** The existing fish ladder located at the upstream limit of the concrete channel would be removed. • **Channel Improvements.** The existing bed and banks of the channel would be graded to provide a hydraulically gradual and smooth transition from the upstream natural channel to the downstream concrete channel. • **Grade Control and Slope Protection.** Large rock would be strategically placed to line the bed and banks to meet the finished grades and protect an existing Ross Valley Sanitation District sanitary sewer pipeline from erosion and scouring.
Unit 3	• **Upper Channel Concrete Removal.** The existing concrete channel and walls in Frederick Allen Park would be removed and replaced with natural substrate. • **Channel Improvements.** The channel corridor within Frederick Allen Park would be widened along the left bank[1] after the existing concrete is removed. A portion of the existing park would be lowered to yield a new floodplain bench. • **New and Modified Flood Wall.** A new floodwall would be constructed along the western edge of the Frederick Allen Park with heights up to 3 feet above grade. Another floodwall (up to 4 feet height) would be constructed on top of the existing concrete wall downstream of College Avenue. • **New and Enhanced Fish Pools.**[2] New fish pool structures would be installed to improve fish passage in the concrete channel. • **New Permanent Access.** A new access ramp would be constructed in the intersection of Locust Avenue and Cedar Avenue to provide channel access. • **Stormwater Pump Station and Backup Power.** A new stormwater pump station would be constructed at Laurel Avenue to convey runoff from the Granton Park neighborhood and tributary area to east of Sir Francis Drake Boulevard.
Unit 2	• **Lower Channel Concrete Removal.**[3] The existing concrete channel from the Stadium Way pedestrian bridge downstream to the confluence at the earthen channel would be removed. • **New and Modified Floodwall.** The left bank would remain either an existing concrete wall, a new shorter wall, or a rock embankment to protect the existing Ross Valley Sanitation District sanitary sewer pipeline.


County: Marin
7.5' Quad Maps: San Rafael
Section, Township, Range Info:
Section 31, T.2N, R.6W
Sections 5, 6, T.1N, R.6W
UTM Coordinates (Zone 10N, NAD83)
Easting Northing
539300 4201100
Ross
Kentfield
Murray Park
Moore Hill
Ross Hill
Phoenix Lake
College of Marin
Albert Field
Gerstle Park
Water Tanks
San Francisco Theological Seminary
Tamalpais
Corte Madera Creek
Service Layer Credits: Copyright © 2013 National Geographic Society, i-cubed
Project Area
N
0 0.125 0.25 0.5 Miles
Horizon WATER and ENVIRONMENT
Marin County Flood Control and Water Conservation District
Corte Madera Creek Flood Risk Management Project, Phase 1

COUNTY OF MARIN

DEPARTMENT OF PUBLIC WORKS

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Raul M. Rojas
DIRECTOR

Administration
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Real Estate

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Stormwater Program

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June 23, 2020

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P.O. Box 699
9252 Bush Street, Suite 2
Plymouth, CA 95669

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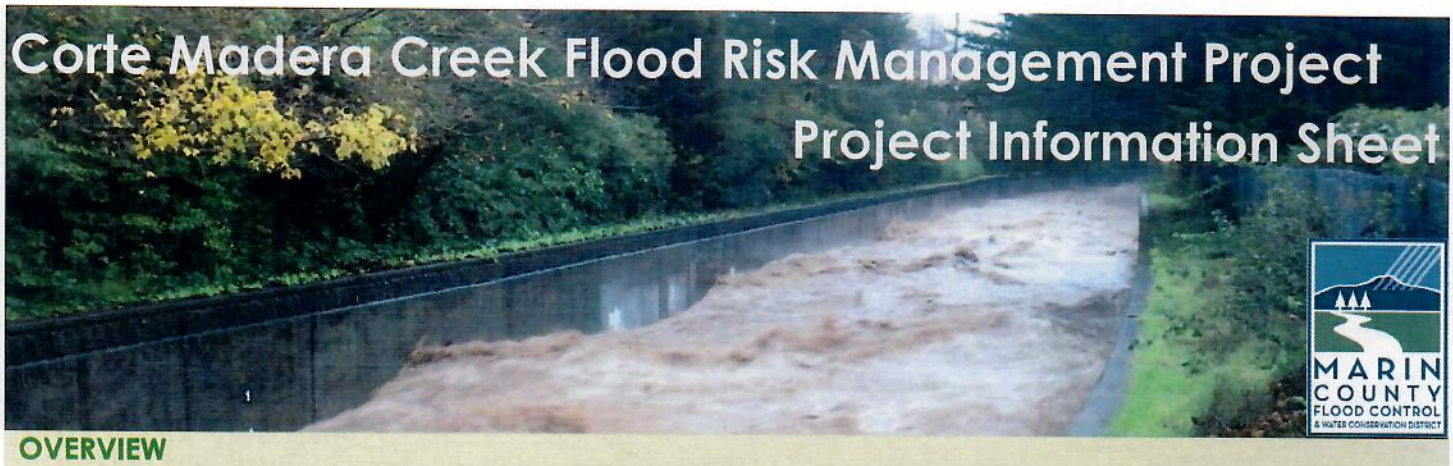

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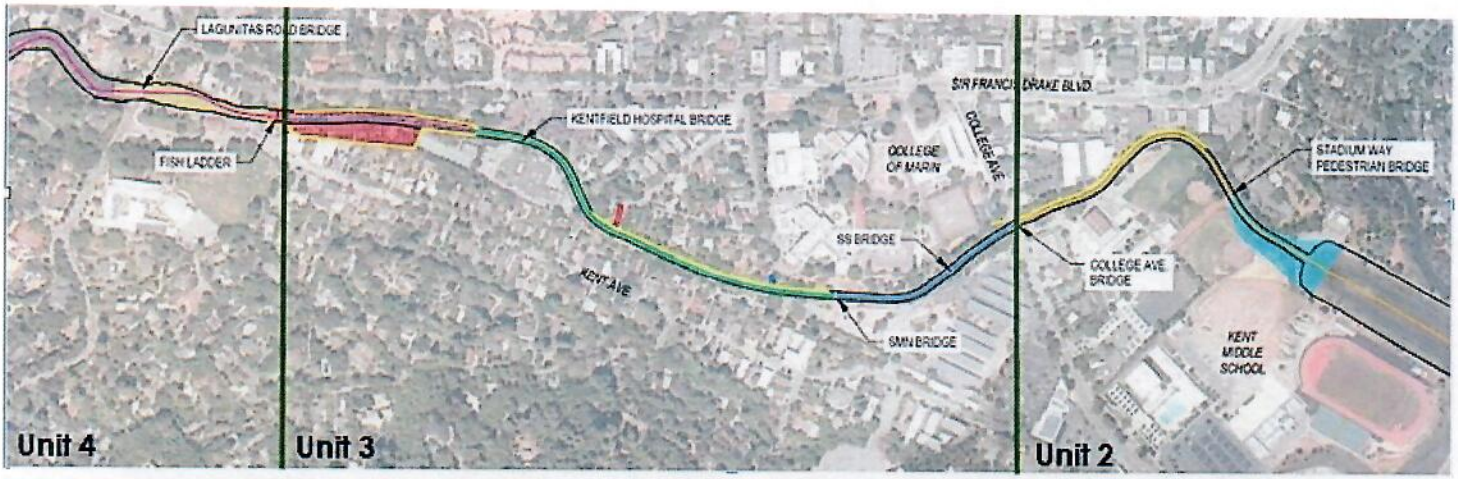

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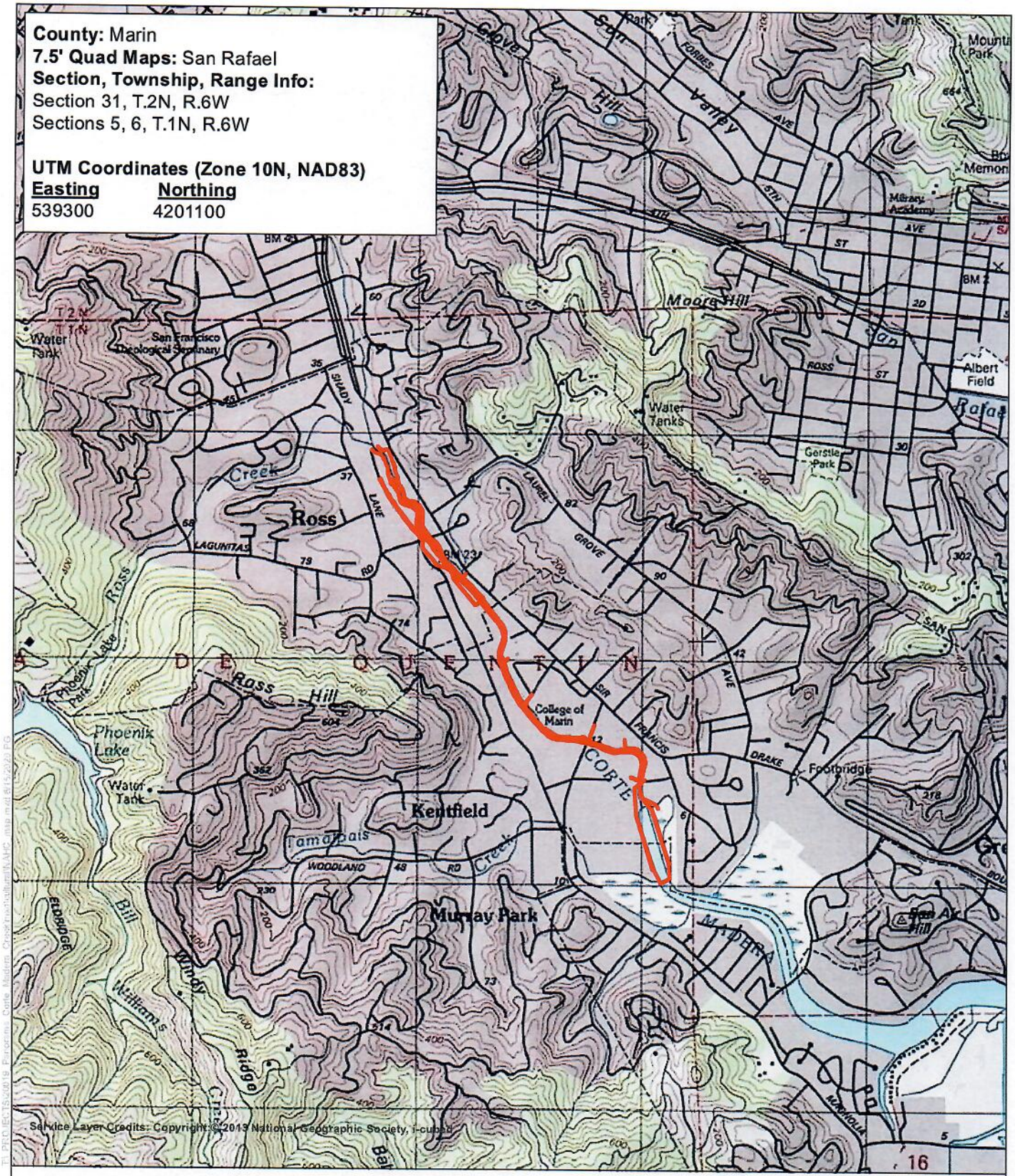

Project Area

Project Area

Horizon WATER and ENVIRONMENT

Marin County Flood Control and Water Conservation District
Corte Madera Creek Flood Risk Management Project, Phase 1

From:	Janis Offermann
To:	"THPO@gratonrancheria.com"
Cc:	"JDixon@marincounty.org"; "Susanne Heim"; Brian Piontek
Subject:	FW: Corte Madera Creek Flood Risk Management Project
Date:	Wednesday, August 05, 2020 5:04:00 PM
Attachments:	Compiled_FIGR_AB52 letter_06232020.pdf

Good afternoon Buffy,

I am writing on behalf of Marin County about the above referenced project. To date, the County has not received any formal comments from the Federated Indians of Graton Rancheria regarding the attached letter sent on June 23, 2020 pursuant to Public Resources Code § 21080.3.1 (Assembly Bill 52). Please contact Joanna Dixon at JDixon@marincounty.org or (415) 473-7031 by Wednesday, August 12, 2020, seven days from tomorrow, if you wish to comment on this project.

Thank you for your time
janis

Janis Offermann
Cultural Resources Practice Leader
Horizon Water and Environment
400 Capitol Mall, Suite 2500
Sacramento, CA 95814
916.465.8076 – office
530.220.4918 – mobile

From:	Janis Offermann
To:	"sara@ionemiwok.net"
Cc:	"JDixon@marincounty.org"; "Susanne Heim"; Brian Piontek
Subject:	Corte Madera Creek Flood Risk Management Project
Date:	Wednesday, August 05, 2020 5:01:00 PM
Attachments:	Compiled_Ione_AB52 letter_06232020.pdf

Good afternoon Chairwoman Setshwaelo,

I am writing on behalf of Marin County about the above referenced project. To date, the County has not received any formal comments from the Ione Band of Miwok Indians regarding the attached letters sent on June 23, 2020 pursuant to Public Resources Code § 21080.3.1 (Assembly Bill 52). Please contact Joanna Dixon at JDixon@marincounty.org or (415) 473-7031 by Wednesday, August 12, 2020, seven days from tomorrow, if you wish to comment on this project.

Thank you for your time
janis

Janis Offermann
Cultural Resources Practice Leader
Horizon Water and Environment
400 Capitol Mall, Suite 2500
Sacramento, CA 95814
916.465.8076 – office
530.220.4918 – mobile

FEDERATED INDIANS OF
GRATON
RANCHERIA

Submitted via electronic e-mail: JDixon@marincounty.org

August 6, 2020

RE: Formal Request for Tribal Consultation Pursuant to the California Environmental Quality Act (CEQA), Public Resources Code section 21080.3.1, subds. (b), (d) and (e) for the *Corte Madera Creek Flood Risk Management Project within the Town of Ross and unincorporated Kentfield areas of the County of Marin.*

Dear Agency Representative:

This letter constitutes a formal request for tribal consultation under the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e) for the mitigation of potential project impacts to tribal cultural resource for a project within the Federated Indians of Graton Rancheria's ancestral lands.

Receiving this letter sets forth the Tribe's formal request for consultation on the following topics checked below, which shall be included in consultation if requested (Public Resources Code section 21080.3.2, subd. (a):

___x__ Alternatives to the project
___x__ Recommended mitigation measures
___x__ Significant effects of the project

The Tribe also requests consultation on the following discretionary topics checked below (Public Resources Code section 21080.3.2, subd. (a):

___x__ Type of environmental review necessary
___x__ Significance of tribal cultural resources, including any regulations, policies or standards used by your agency to determine significance of tribal cultural resources
___x__ Significance of the project's impacts on tribal cultural resources
___x__ Project alternatives and/or appropriate measures for preservation or mitigation that we may recommend, including, but not limited to:

(1) Avoidance and preservation of the resources in place, pursuant to Public Resources Code section 21084.3, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks or other open space, to incorporate the resources with culturally appropriate protection and management criteria;
(2) Treating the resources with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resources, including but not limited to the following:
    a. Protecting the cultural character and integrity of the resource;

6400 Redwood Drive, Suite 300 • Rohnert Park, CA • 94928 • Office: 707.566.2288 • Fax: 707.566.2291
www.gratonrancheria.com

b. Protection the traditional use of the resource; and
c. Protecting the confidentiality of the resource.

(3) Permanent conservation easements or other interests in real property, with culturally Appropriate management criteria for the purposes of preserving or utilizing the resources or places.

(4) Protecting the resource.

Additionally, the Tribe would like to receive any cultural resources assessments or other assessments that have been completed on all or part of the project's potential "area of project effect" (APE), including, but not limited to:

1).The results of any record search(es) conducted at an archaeological information center of the California Historical Resources Information System (CHRIS), including, but not limited to:

(a) Any known cultural resources that have already been recorded on or adjacent to the potential APE;
(b) Whether the probability is low, moderate or high that cultural resources are located in the potential APE; and
(c) If a survey is required to determine whether previously unrecorded cultural resources are present in the potential APE.

2). The results of any archaeological inventory survey that was conducted of all or part of the potential APE, including, but not limited to:

(a) Any report that may contain site forms, site significance, and suggested mitigation measures.

3). The results of any Sacred Lands File searches conducted through the Native American Heritage Commission for all or part of the potential APE;

4). Any ethnographic studies conducted for any area including all or part of the potential APE; and

5) Any geotechnical reports regarding all or part of the potential APE.

We would like to remind your agency that CEQA Guidelines section 15126.4, subdivision (b)(3) states that preservation in place is the preferred manner of mitigating impacts to archaeological sites. Section 15126.4, subd. (b)(3) of the CEQA Guidelines has been interpreted by the California Court of Appeal to mean that "feasible preservation in place must be adopted to mitigate impacts to historical resources of an archaeological nature unless the lead agency determines that another form of mitigation is available and provides superior mitigation of impacts." *Madera Oversight Coalition v. County of Madera* (2011) 199 Cal.App.4th 48, disapproved on other grounds, *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439.

FEDERATED INDIANS OF
GRATON
RANCHERIA

The Tribe would like to begin consultation within 30 days of your receipt of this letter. Please contact my office at (707) 566-2288 or by email at bmcquillen@gratonrancheria.com as the person who will serve as the lead contact on behalf of the Tribe.

Sincerely,

Buffy McQuillen, THPO/NAGPRA
Federated Indians of Graton Rancheria

6400 Redwood Drive, Suite 300 • Rohnert Park, CA • 94928 • Office: 707.566.2288 • Fax: 707.566.2291
www.gratonrancheria.com

From:	Janis Offermann
To:	"THPO@gratonrancheria.com"
Cc:	"JDixon@marincounty.org"; "Susanne Heim"; Brian Piontek
Subject:	Corte Madera Creek Flood Risk Management Project - Response to AB52 consultation request
Date:	Friday, August 21, 2020 11:15:00 AM
Attachments:	Results Letter_01052017.pdf 19-2242_Results Letter.pdf Resource list_01072017.pdf Resource list_072020.pdf SLF No Corte Madera Creek Offerman Marin 2020.06.16 (003).pdf

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Good morning, Buffy.

My name is Janis Offermann, with Horizon Water and Environment (Horizon), and I am the contractor who is leading the cultural resources and tribal cultural resources elements of the Corte Madera Creek Flood Risk Management Project. Joanne Dixon, with Marin County, has asked that I respond to some of the requests for information that you included in your letter to her dated August 6, 2020, as I have access to the confidential files and she does not. With this in mind, I will respond to the following items requested in your letter:

1). The results of any record search(es) conducted at an archaeological information center of the California Historical Resources Information System (CHRIS), including, but not limited to:

(a) Any known cultural resources that have already been recorded on or adjacent to the potential APE;
(b) Whether the probability is low, moderate or high that cultural resources are located in the potential APE; and
(c) If a survey is required to determine whether previously umecorded cultural resources are present in the potential APE.

2). The results of any archaeological inventory survey that was conducted of all or part of the potential APE, including, but not limited to:

(a) Any repo1i that may contain site forms, site significance, and suggested mitigation measures.

3). The results of any Sacred Lands File searches conducted through the Native American Heritage Commission for all or part of the potential APE;

4). Any ethnographic studies conducted for any area including all or paii of the potential APE; and

5) Any geotechnical reports regarding all or part of the potential APE.

Before addressing these topics, I would like to point out that this is the same project that was put forward by the U.S. Army Corps of Engineers (USACE) in their Corte Madera Creek Flood Risk Management Project Environmental Impact Statement/ Environmental Impact Report (EIS/EIR) (available at https://www.marinwatersheds.org/sites/default/files/2018-10/Corte_Madera_Creek_FRM_Draft_EIS-EIR_6Oct2018_0.pdf), but the County has now taken over the project with minor alterations. According to information in Appendix M – Cultural Resources of the draft EIS/EIR (at https://www.marinwatersheds.org/sites/default/files/2018-10/Appendix_M_Cultural_Resources.pdf), the USACE requested consultation with the FIGR via

letters dated September 12, 2016 and again on September 25, 2018. Text in the EIS/EIR suggests that the FIGR did not responded to these requests. I wanted to bring this to your attention in case this project seemed familiar. Now on to the information requested.

1).The results of any record search(es) conducted at an archaeological information center of the California Historical Resources Information System (CHRIS).

I have attached the record search response letters from the two record searches that have been conducted by the Northwest Information Center of the CHRIS. The USACE conducted a record search in 2017 (NWIC File No.: 16-0601) and I requested a record search during this summer of 2020 (NWIC File No.: 19-2242). Note that I requested information that augmented the USACE's search; I did not request an entirely new search of the project footprint.

The USACE record search identified two previously recorded resources within the project area and eight within the 500-foot search buffer. The two in the project area include a bridge and a prehistoric site that was determined to consist of redeposited material through site investigations. Four of the eight within the 500-foot search buffer were Native American sites. The 2020 record search did not identify and other previously recorded sites within the project footprint, but one built environment resource had been recorded within the search buffer. I will send the site records for the Native American sites to you via a secure file share site, Hightail. If you would also like the built environment site records, please let me know. The two lists of resources from the record searches are attached.

As demonstrated by the numbers of previous surveys within the project area in the record search results, the footprint, as well as the 500-foot search buffer, has been well-covered in the past. If you would like additional details on these previous studies, please let me know and I will forward you the study lists and studies. I will send the IC maps of resource and study locations when I send the site records.

2). The results of any archaeological inventory survey that was conducted of all or part of the potential APE.

The USACE conducted an archaeological survey of the project area, as noted in the 2018 draft EIS/EIR, but they did not prepare a stand-alone report. However, a letter to the State Historic Preservation Officer, found in Appendix M, summarizes the results of the study. Furthermore, I recently talked with the USACE archaeologist to determine what portions of the project area, if any, had not been surveyed. She indicated that two parcels, just downstream from Lagunitas Bridge were not accessible for survey. The USACE did not observe any archeological resources in the project footprint, but did see some shell fragments that are likely associated with site CA-MRN-406, which was in the larger project study area.

In July of this year, a Horizon archaeologist surveyed the areas not covered by the USACE, along with all of the proposed staging areas, a proposed access ramp, and a new pump location. Furthermore, he examined the location of the Native American site in the project footprint, as identified in the first record search, and did not see any evidence of the deposit. He also surveyed project areas in proximity to other previously recorded sites (i.e., CA-MRN-406), and did not see evidence of cultural resources. Horizon will be preparing a stand-alone report in which we will summarize the USACE work as well as the survey from this summer. Furthermore, we will do a geoarchaeological analysis

of the project area. It is worthy to note that the current alignment of the creek has been moved a bit from its original position. We will be discussing it in our report and in the project EIR. A draft of the report will be provided to you for comment, at your request.

3) The results of any Sacred Lands File searches conducted through the Native American Heritage Commission for all or part of the potential APE;

The Sacred Lands File search by the NAHC was negative. A copy of their response letter is attached.

4) Any ethnographic studies conducted for any area including all or part of the potential APE; and

5) Any geotechnical reports regarding all or part of the potential APE.

The USACE did not conduct an ethnographic study for their project, and a study is not planned for the County project. Also, there currently is not a geotechnical report available for the project, although a geotechnical study will be conducted in the future.

I hope this information has been helpful. Please watch for an email from Hightail, which will contain the site records I mentioned, along with the maps from the IC record searches. If you would like other information provided by the IC, please don't hesitate to contact me.

Please contact Joanna Dixon, of Marin County (cc'd here), if you would like to schedule a site visit or otherwise set up a meeting for further consultation.

Best regards
janis

Janis Offermann
Cultural Resources Practice Leader
Horizon Water and Environment
400 Capitol Mall, Suite 2500
Sacramento, CA 95814
916.465.8076 – office
530.220.4918 – mobile

From:	Dixon, Joanna
To:	Lewis, Liz; susanne.heim@panoramaenv.com
Cc:	Janis Offermann; Brian Piontek
Subject:	FW: Corte Madera Creek Flood Risk Management Project - Response to AB52 consultation request
Date:	Wednesday, October 21, 2020 3:05:16 PM
Attachments:	Results Letter_01052017.pdf 19-2242_Results Letter.pdf Resource list_01072017.pdf Resource list_072020.pdf SLF No Corte Madera Creek Offerman Marin 2020.06.16 (003).pdf FIGR AB52 Letter - Corte Madera Creek Flood Risk Management Project.pdf

Hi all,
FYI, below is a copy of the follow – up email I just sent to Buffy regarding AB-52 consultation.
Thanks,
Joanna

From: Dixon, Joanna
Sent: Wednesday, October 21, 2020 3:02 PM
To: THPO@gratonrancheria.com; bmcquillen@gratonrancheria.com
Subject: FW: Corte Madera Creek Flood Risk Management Project - Response to AB52 consultation request

Hello Buffy,

I'm reaching out to follow up on your previous request for consultation to find out if you had any remaining questions or concerns regarding our Corte Madera Creek Flood Risk Management Project. Please refer to the information provided by Janis Offermann in the email below sent 8/21/20. If you have remaining questions or need any other information please let me know. I am also happy to organize a meeting with our consultants if you would like to discuss together.

Thank you kindly,
Joanna Dixon
Associate Civil Engineer
Marin County Flood Control & Water Conservation District
(415) 497-9773 cell

From:	Dixon, Joanna
To:	bmcquillen@gratonrancheria.com
Cc:	Janis Offermann; susanne.heim@panoramaenv.com
Subject:	Corte Madera Creek Flood Risk Management Project AB 52 consultation
Date:	Thursday, December 03, 2020 2:26:11 PM
Attachments:	Draft EIR Cultural Resource Mitigation Measure.docx

Hello, Buffy

I am writing to follow up on the Corte Madera Creek Flood Risk Management Project. The following is a chronology of our AB 52 consultation efforts with Federated Indians of the Graton Rancheria (FIGR), to date:

- June 23, 2020: Project notification letter from Joanna Dixon, Marin County Flood Control & Water Conservation District, sent to Buffy McQuillen, Tribal Historic Preservation Officer for the FIGR.
- August 5, 2020: Email follow up to Buffy McQuillen from Janis Offermann, Cultural Resources Specialist with Horizon Water and Environment, on behalf of Ms. Dixon regarding receipt of the project notification letter.
- August 6, 2020: Email from Ms. McQuillen containing a letter requesting AB 52 consultation on the project. The letter also requested information, including but not limited to, information from a records search, archaeological survey, and a sacred lands file search.
- August 21, 2020: Email reply to Ms. McQuillen from Ms. Offermann, providing results from the records search, archaeological survey, and a sacred lands file search.
- October 21, 2020: Email from Ms. Dixon to Ms. McQuillen as a follow up to the August 21 email.

We have not received any concerns or comments from you about this project since the information was sent in August. We are currently preparing to issue the public draft
Environmental Impact Report for this project and in lieu of receiving comments from you, we have drafted the attached mitigation measure for addressing the discovery of archaeological resources that could be determined tribal cultural resources. The District respectfully requests that FIGR review and comment on the attached mitigation measure within 30 days (January 1, 2021). If we do not hear from you within that time, we will assume that you have no comments and our consultations on this project will be complete.

Please note, however, that the District remains open to discussing any specific issues you have about tribal cultural resources within the project area or modifications to the mitigation measures, and requests that you notify me as soon as possible so that we can schedule a meeting to discuss such issues.

Sincerely,

Joanna Dixon
Project Manager
Marin County Flood Control and Water Conservation District
(415) 497-9773

Email Disclaimer: https://www.marincounty.org/main/disclaimers

From:	Buffy McQuillen
To:	Dixon, Joanna
Cc:	Janis Offermann; susanne.heim@panoramaenv.com
Subject:	Re: Corte Madera Creek Flood Risk Management Project AB 52 consultation
Date:	Tuesday, December 08, 2020 6:10:54 AM

Hi Joanna, the measure is acceptable. Thank you for consulting on the project.

Buffy McQuillen

Sincerely,
Buffy McQuillen, THPO
NAGPRA
Federated Indians of Graton Rancheria
(707) 318-0485

Federated Indians of Graton Rancheria and Tribal TANF of Sonoma & Marin - *Proprietary and Confidential*: This transmittal is a confidential communication or may otherwise be privileged. If you are not the intended recipient, you are hereby notified that you have received this transmittal in error and that any review, dissemination, distribution or copying of this transmittal is strictly prohibited. If you have received this communication in error, please notify this office and immediately destroy this message and all its attachments if any.

Appendix G

Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program

Introduction

The Marin County Flood Control and Water Conservation District (District) is the lead agency implementing the California Environmental Quality Act (CEQA) environmental document for the Corte Madera Creek Flood Risk Management Project, Phase 1 (project). The primary goal of the project is to reduce the risk of flooding to provide further protection for life and property along Corte Madera Creek. The District would meet this goal by implementing the project, which would increase creek capacity to allow a greater volume of water to flow in-channel, and enhance creek habitat. The District prepared an Environmental Impact Report (EIR) to evaluate the potential for the project to result in significant adverse effects on the physical environment.

This Mitigation, Monitoring, and Reporting Program (MMRP) has been prepared based upon the findings of the EIR and lists the project-level mitigation and minimization measures recommended in the Draft EIR.

This MMRP is designed to fulfill CEQA Guidelines Section 21081.6(a), which requires public agencies to adopt a reporting or monitoring program whenever a project or program is approved that includes mitigation measures identified in an environmental document for which the agency makes a finding pursuant to CEQA Section 21081(a)(1). Therefore, this MMRP must be adopted when the District makes a final decision on the project.

Table F-1 lists each of the EIR mitigation measures, and includes the following categories for monitoring and reporting.

1. **Implemented By.** The name of the entity responsible for implementing the mitigation measure.
2. **Implementation Timing.** Most measures are to be implemented prior to, during, or immediately after project construction.
3. **Location.** The area(s) where the mitigation applies
4. **Performance Criteria.** The criteria required to ensure the effectiveness of the mitigation measure in mitigating the impact.
5. **Monitored By.** The name of the person who is responsible for monitoring implementation of the mitigation measure. At this time, the field is blank – it will be completed during implementation.
6. **Verified By.** The signature of the responsible person and date compliance is verified. At this time, the field is blank – it will be completed during implementation.

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Table G-1 Mitigation Measures

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
			Aesthetics and Visual Resources				
Impact 3.1-3: The project would substantially degrade the existing visual character or quality of public views of the site and its surroundings	**Mitigation Measure 3.1-3: Large Tree Planting.** The District will integrate ~~large box trees~~ 24-inch or 36-inch box trees into the final planting plan and design for Frederick Allen Park, to the extent ecologically appropriate for the proposed species. The Town of Ross will provide the desired size and species of trees to the District. The final planting plan will be provided to the Town of Ross for review and approval ~~comment~~ no less than 90 days prior to landscaping. The District will be responsible for maintaining replacement trees until they become established and for replacing dead trees for a period of no less than 10 years.	• Frederick Allen Park	• Planting plan submitted to Town of Ross for review • Large box trees are planted where feasible	• Marin County Flood Control and Water Conservation District (District) • Contractor	• Prior to construction • During construction • After construction		
			Air Quality				
Impact 3.2-2: The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	**Mitigation Measure 3.2-2: Fugitive Dust Measures.** To limit dust, criteria pollutants, and precursor emissions associated with construction, the following BAAQMD-recommended fugitive dust control measures shall be implemented and included in all contract specifications for components constructed under the project: • All exposed surfaces (e.g., unpaved parking areas, unpaved staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • Construction equipment shall be properly maintained by a certified mechanic. • A publicly visible sign shall be posted with the telephone number and person to contact at the District regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.	• Unit 4 and Frederick Allen Park	• BAAQMD fugitive dust control measures are implemented	• The District • Contractor	• During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
Impact 3.2-3: The project would not expose sensitive receptors to substantial pollutant concentrations.	**Mitigation Measure 3.2-3: Engine Controls for Construction Equipment.** All off-road equipment greater than 25 horsepower that operates for more than 20 total hours over the entire duration of construction activities shall have engines that meet the USEPA or CARB Tier 3 off-road and Diesel Particulate Filter level 3 emission standards or more stringent standards for all phases of construction except the Lower College of Marin concrete channel removal.	• Entire project area	• All off-road diesel-powered equipment (more than 25 horsepower) is equipped with engines that achieve U.S. Environmental Protection Agency Tier 3 and Diesel particulate Filter level 3 emissions standards or more stringent.	• The District • Contractor	• During construction		
Biological Resources							
Impact 3.3-1: The project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	**Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities.** Prior to construction, the District shall have a qualified botanist conduct botanical surveys according to CDFW protocols (i.e., Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities [CDFW, 2018 or more current]) during the appropriate time(s) of year (i.e., surveys shall coincide with the phenological stage during which the potential special-status plant species are identifiable in the field—for example, in April and again in July) to determine if any potential special-status plant species or sensitive natural communities are located within or immediately adjacent to the project area. If construction is planned to begin prior to the completion of comprehensive botanical surveys (e.g., construction is planned for April 2022, but plant surveys are planned for April and July), then the District shall conduct comprehensive plant surveys the year prior to construction (e.g., in 2021). If no special-status plants or sensitive natural communities are observed during appropriately timed surveys by a qualified botanist, it is assumed the construction activity will have no impact on special-status plants or sensitive natural communities and no further action is required. Immediately preceding construction, the District shall flag or otherwise mark (e.g., stake, fence) areas with special-status plants or sensitive natural communities within the project area for avoidance, including a 10-foot radius buffer. The District also shall identify locations for equipment and personnel-access and materials staging that will minimize disturbance in riparian habitat and coastal brackish marsh. When heavy equipment is required, unintentional soil compaction shall be minimized by using equipment with a greater reach or using low-pressure equipment. A biological monitor shall be present during construction within a 10-foot buffer of special-status plants to ensure impacts are avoided. If avoidance of any special-status plant is not possible, prior to construction the District shall coordinate with CDFW and/or USFWS to establish procedures for compensatory mitigation. These	• Unit 4; Frederick Allen Park; Unit 2 and 3 floodwalls; stormwater pump station; and lower College of Marin	• Botanical surveys conducted according to CDFW protocols • Avoidance areas Flagged or marked • Compensatory mitigation at a minimum 1:1 ratio for unavoidable impacts on special-status plants or natural communities	• The District • Contractor	• Prior to construction • During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	measures may include collection of seeds when mature (generally the beginning of plant senescence) and salvage and transplant of any special-status plants that would otherwise be impacted by construction activities. Mitigation ratios, location, and timing of transplants shall be determined in consultation with CDFW and/or USFWS, and the mitigation ratio will be at a minimum of 1:1. The District shall monitor the success of transplant establishment for a period of at least three years, or as otherwise required by CDFW and/or USFWS. Location of transplanted individuals shall be recorded using a submeter-accuracy global positioning system (GPS) to enable location of the special-status plant species during and after the monitoring period is complete.						
	Mitigation Measure 3.3-1b: Fish Capture and Relocation. If in-channel work requires dewatering, including for sediment-removal maintenance activities, fish shall be captured and relocated upstream of the project areas to avoid injury and mortality and minimize disturbance. The District shall implement the measures below and described in the fish rescue plans in Appendix D, or whatever more stringent species-preservation and avoidance measures are imposed by resource agencies, including NMFS and CDFW, with jurisdiction over aquatic special-status species. 1. The name(s) and credentials of qualified biologist(s) to act as construction monitors shall be submitted to CDFW and NMFS for approval at least 15 days before construction work begins. 2. Prior to and during the initiation of construction activities, a qualified fisheries biologist (i.e., approved by CDFW and/or NMFS) shall be present during installation and removal of creek-diversion structures. 3. For sites that require flow diversion and exclusion, the work area shall be blocked by placing fine-meshed nets or screens above and below the work area to prevent salmonids from re-entering the work area. To minimize the potential for re-entry, mesh diameter shall not exceed 1/8 inch. The bottom edge of the net or screen shall be secured to the channel bed to prevent fish from passing under the screen. Exclusion screening shall be placed in low-velocity areas to minimize fish impingement against the mesh. Screens shall be checked periodically and cleaned of debris to permit free flow of water. 4. Before removal and relocation on individual fish begins, a qualified fisheries biologist shall identify the most appropriate release location(s). In general, release locations should have water temperatures similar to (<3.6 degrees Fahrenheit difference) the capture location and offer ample habitat (e.g., depth, velocity, cover, connectivity) for released fish and should be selected to minimize the likelihood of reentering the work area or becoming impinged on exclusion nets or screens.	• Area where in-channel work requires dewatering	• Use approved techniques for dewatering and fish relocation • Implement measures to protect aquatic special-status species	• The District • Contractor	• During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	5. The means of capture shall depend on the nature of the work site and shall be selected by a qualified fisheries biologist as authorized by CDFW and NMFS. Complex stream habitat may require the use of electrofishing equipment, whereas in outlet pools, fish and other aquatic species may be captured by pumping down the pool and then seining or dip netting. Electrofishing, if necessary, shall be conducted only by properly trained personnel holding current permits from CDFW and NMFS and following the most recent NMFS electrofishing guidelines (NMFS, 2000). 6. Initial fish relocation efforts shall be performed several days prior to the scheduled start of construction and continue through cofferdam installation and work-area dewatering activities. 7. Flow diversions and species relocation shall be performed during morning periods. The fisheries biologist shall survey the exclusion screening throughout the diversion effort to verify that no special-status fish, amphibians, or aquatic invertebrates are present. Handling of fish shall be minimized. When handling is necessary, personnel shall wet hands or nets before touching them. 8. Prior to translocation, fish that are collected during surveys shall be temporarily held in cool, aerated, shaded water using a five-gallon container with a lid. Overcrowding in containers shall be avoided; at least two containers shall be used, and no more than 25 fish shall be kept in each bucket. Aeration shall be provided with a battery-powered external bubbler. Fish shall be protected from jostling and noise and shall not be removed from the container until the time of release. A thermometer shall be placed in each holding container, and cold blocks or partial water changes shall be conducted as necessary to maintain a stable water temperature. Special-status fish shall not be held more than 30 minutes. 9. If fish are abundant, capture shall cease periodically to allow release and minimize the time fish spend in holding containers. 10. Fish shall not be anesthetized or measured. However, they shall be visually identified to species level, and year classes shall be estimated and recorded. 11. Reports on fish-relocation activities shall be submitted to CDFW and NMFS in within two weeks following completion of in-channel operations.						
	Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection. All construction personnel shall attend an environmental education program delivered by a qualified biologist prior to working in the project area. The training shall include an explanation as how to best avoid the accidental take of special-status species, including salmonids and other fish species, amphibians, reptiles, birds, and rare plants.	• Entire project area	• All construction personnel receive environmental training by a qualified biologist	• The District • Contractor	• Prior to construction • During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	The training session shall be mandatory for contractors and all construction personnel. The field meeting shall include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis shall be placed on the importance of the habitat and life-stage requirements within the context of maps showing areas where minimization and avoidance measures are being implemented. The program shall include an explanation of appropriate federal and state laws protecting endangered species and all mitigation measures that will be implemented to avoid significant impacts on special-status species. Each person will receive a training handout for their use and reference. The contractor shall provide closed garbage containers for the disposal of all trash items (e.g., wrappers, cans, bottles, food scraps). Work sites shall be cleaned of litter before closure each day and litter placed in wildlife-proof garbage receptacles. Construction personnel shall not feed or otherwise attract any wildlife. No pets, excluding service animals, shall be allowed in construction areas.						
	Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds. If tree removal occurs outside of the nesting season, no surveys or monitoring would be needed. If tree removal or construction occurs in the nesting season (February 1 to August 31), a qualified biologist shall conduct a white-tailed kite and general nesting bird survey within the project area and areas within a 500-foot buffer from project construction. If active nests are identified, a no-disturbance buffer zone will be established around the nest as appropriate and in consideration of line-of-sight for the bird as well as existing human presence/activities around the nest when it was established; recommended buffers are 500 feet for white-tailed kite and non-listed raptors, and 25 feet to 250 feet for other non-listed birds as recommended by a biologist who is qualified to assess avian breeding behavior. Smaller buffers may be appropriate in the project area given the limited line of site due to existing development and anthropogenic disturbance in the area (e.g., traffic on Sir Francis Drake and adjoining areas). Construction work may continue outside of the no-work buffer.	• Unit 4; Frederick Allen Park; Unit 2 and 3 floodwalls; stormwater pump station; lower College of Marin	• Implement impact-avoidance work windows or conduct pre-construction nesting bird surveys and establish construction buffer zone for impact avoidance	• The District • Contractor	• During construction		
	Mitigation Measure 3.3-1e: Invasive Plant Species Control. All vehicles and equipment entering the project shall be washed to remove dirt, pathogens, invasive plant seeds, or invasive plant parts prior to entry on the project site. Particular attention shall be shown to the undercarriage and any surface where soil containing invasive plant seeds may exist. The District shall dispose of the waste material in an appropriate disposal facility. Arrangements shall be made for inspection of each piece of equipment before entering the project construction areas to ensure all equipment has been properly washed. The District shall follow these additional measures:	• Entire project area	• Vehicles and equipment are washed prior to arriving on site • Only weed-free seed and revegetation material are used • Nursery certified to implement practices to prevent spread of SOD	• The District • Contractor	• During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	• Any permanent or temporary erosion control measures implemented to minimize erosion during and after construction shall be certified weed-free. • Nursery operations that supply revegetation or seeding plant material must certify implementation of best management practices to reduce pest and pathogen contamination within their nursery, including of Phytophthora pathogens, the pathogen responsible for Sudden Oak Death (SOD). • All tree removal and trimming activities shall include measures to avoid the spread of SOD (Phytophthora) pathogens. This may include, but is not limited to the following: – As a precaution against spreading the pathogen, pruning tools shall be cleaned and disinfected after use on confirmed or suspected infested trees or in known infested areas. Tools shall be sanitized before pruning healthy trees or working in pathogen-free areas. Chippers and other vehicles of mud, dirt, leaves, organic material, and woody debris shall be cleaned before leaving a site known to have SOD and before entering a site with susceptible hosts. – Crews shall be informed about the arboricultural implications of SOD and sanitation practices when they are working in infested areas. – Sanitation kits containing chlorine bleach, scrub brush, metal scraper, boot brush, and plastic gloves shall be provided to crews. – Shoes, pruning gear, and other equipment shall be sanitized before working in an area with susceptible species. – When possible, the District shall conduct work on SOD-infected and susceptible species during the dry season (June through October). When working in wet conditions, equipment shall be kept on paved, graveled, or dry surfaces and mud avoided. The District shall work in disease-free areas before proceeding to any infested areas. – If possible, soil or plant material (wood, brush, leaves, and litter) from host trees in any infested areas shall not be collected. Rather, material (e.g., wood, bark, brush, chips, leaves, or firewood) from tree removals or pruning of symptomatic or non-symptomatic host plants shall remain on site to minimize pathogen spread. – All reasonable methods to sanitize personal gear and crew equipment shall be used before leaving an SOD infested site. Accumulated soil and mud shall be scraped, brushed, and/or hosed off from clothing, gloves, boots, and shoes. Mud and plant debris shall be removed by blowing out or power washing chipper trucks, chippers, bucket trucks, fertilization and soil aeration equipment, cranes, and other vehicles. Movement of		• Tree removal includes practices to avoid spread of SOD				

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	soil and leaf litter shall be restricted under and around infected trees as spores may be found there. – Tools used in tree removal/pruning may become contaminated and shall be disinfected with alcohol or chlorine bleach.						
	Mitigation Measure 3.3-1f: Intertidal Upstream of Stadium Way Cofferdam. Prior to completing construction of the cofferdam near Stadium Way for the Unit 2 dewatering, an inspection of the reach upstream will be conducted to determine if tidal water is present at low tide. A fish removal/herding effort will be initiated if tidal water is present. The fish removal/herding effort will consist of a beach seine sweep beginning at the upstream end of tidal water and proceeding in a downstream direction to the Stadium Way cofferdam site. The impoundment structure could be completed once the sweeping action is downstream of the cofferdam. This action would ensure that estuarine fish would not be stranded in standing water upstream of the Stadium Way cofferdam and be subject to injury or mortality during the approximately eight weeks this reach would be cut off from tidal flux.	• Stadium Way cofferdam	• Conduct inspection to determine if tidal water is present in area of upstream cofferdam • Initiate fish removal herding effort if tidal water present in area of cofferdam installation	• The District • Contractor	• During construction		
	Mitigation Measure 3.3-1g: Avoid Salt Marsh Harvest Mouse. Prior to initiation of project work in potential salt marsh harvest mouse habitat, the areas and pathways to be affected will be flagged by construction personnel and verified by a Qualified Biological Monitor (including work areas, staging areas, and access roads/paths to these work and staging areas). The flagged areas(s) will include a two-foot perimeter buffer. All wetland vegetation and other vegetation within 50 feet of wetland vegetation requiring removal will be removed under the supervision of the USFWS- and CDFW-approved Qualified Biological Monitor. This vegetation will be salvaged and maintained on site and will be replanted upon completion of construction activities. Vegetation removal shall start at the edge farthest from the salt marsh or the poorest habitat and work its way towards the salt marsh or the better salt marsh habitat. If a mouse of any species is observed within the areas being removed of vegetation, work shall be halted and the USFWS and CDFW shall be notified. To prevent salt marsh harvest mice from moving through the project site during construction, temporary exclusion fencing will be placed around defined work area(s) identified by the Qualified Biological Monitor prior to the start of construction activities. The fencing will be installed immediately after vegetation removal, with the two-foot buffer (cleared of vegetation) remaining between fencing and existing vegetation. The fence will consist of silt fencing (or similar material) and will be buried to a minimum depth of two inches so that mice cannot crawl under the fence. Fence height will be at least one foot higher than the highest adjacent vegetation, with a minimum height of two feet. All supports for the exclusion fencing will be	• Lower College of Marin	• Flag potential salt marsh harvest mouse habitat • Qualified Biological Monitor supervises vegetation removal within 50 feet of wetland habitat • Stop work and notify USFW and CDFW if mouse of any species is observed • Install exclusion fencing • Qualified Biological Monitor inspects the exclusion fencing prior to the start of daily construction activities • Cap pipes or similar objects in mouse habitat • Schedule work to avoid extreme high tides	• The District • Constructor • Qualified Biological Monitor	• Prior to construction • During construction • After construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	placed on the inside of the work area. The fencing will be immediately removed upon project completion. Prior to the start of daily construction activities, the Qualified Biological Monitor will inspect the exclusion fencing to ensure that it is functional (e.g., has no rips or tears and remains buried in the ground). The fenced area(s) will also be inspected to ensure that no mice are trapped there. Any mice suspected to be salt marsh harvest mice that are found along and outside the fence will be closely monitored until they move away from the construction area. To prevent potential entrapment of salt marsh harvest mice in work equipment, pipes or similar objects located in salt marsh harvest mouse habitat will be capped prior to the end of the workday and then inspected by the biological monitor prior to commencement of work activities the following day. Work in or immediately adjacent to vegetated marsh areas, as identified by the Qualified Biological Monitor, will be scheduled to avoid extreme high tides because protective cover for mice is limited at this time. Specifically, no work will occur two hours before or after extreme high tides as directed by the Qualified Biological Monitor for 6.0 feet National Geodetic Vertical Datum (NGVD) or above, as measured at the Golden Gate Bridge, or adjusted to the timing of local extreme high-tide events in which the marsh plain is flooded.						
Impact 3.3-2: The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	**Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities (see above)**	• (see above)	• (see above)	• The District • Contractor	• Prior to construction • During construction		
	Mitigation Measure 3.3-1e: Invasive Plant Species Control (see above)	• (see above)	• (see above)	• The District • Contractor	• During construction		
	Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan. The District shall prepare a Habitat Restoration and Monitoring Plan for revegetation prior to construction activities as detailed herein. The plan shall describe any required salvage and replanting protocols prior to and after construction is complete. The plan shall include, but not be limited to, protocols for replanting of vegetation removed prior to or during construction and management and monitoring of the plants to ensure replanting success pursuant to the most stringent requirements included in permits issued for the project. At a minimum, impacted trees greater than or equal to six inches diameter at breast height (dbh) shall be mitigated at a minimum of 1:1 replacement for nonnative tree species and 3:1 replacement for native tree species. Monitoring and any necessary maintenance of revegetated areas shall occur for a minimum of ten years. The plan shall specify monitoring and performance criteria for the species planted and invasive species control criteria as well as the best time of year for planting and seeding to occur, pursuant to	• Unit 4 • Frederick Allen Park • Lower College of Marin	• Habitat Restoration Monitoring Plan implemented to restore impacted native riparian habitat and native vegetation • Trees replaced at a minimum ratio of 1:1 for nonnative trees and 3:1 for native trees • Planted trees and shrubs meet a minimum of 85% survival after 5 years • Wetland and waters are replaced at a minimum ratio of 1:1	• The District • Contractor	• Prior to construction • During construction • After construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	requirements of permits from the various resource agencies with regulatory purview over the project. At a minimum, replanted woody trees and shrubs shall have a minimum of 85% survival after five years of monitoring to track progress toward performance criteria. Additional monitoring shall be conducted if the revegetated areas do not meet the performance criteria in year five; any replacement plants shall be monitored with the same survival criteria for five years after planting. Areas impacted by construction-related activity shall be replanted or reseeded with native trees, shrubs, and herbaceous perennials and annuals from the watershed under guidance from a qualified biologist. Local plant materials shall be used for revegetation of the disturbed area. The plant materials shall include local cuttings from the local watershed or from adjacent watersheds. Seeds shall be collected during the appropriate season, and the container plants shall be of an appropriate size for out-planting. The Habitat Restoration and Monitoring Plan shall also address restoration of jurisdictional wetlands and waters. Temporary impacts to wetlands shall be restored on site with native wetland species under guidance from a qualified biologist. Permanent impacts to jurisdictional wetlands shall be mitigated for by replacement on or off site at a minimum 1:1 ratio or whatever more stringent requirements are included in the permits to be issued for the project. The monitoring plan shall include annual monitoring of restored areas for at least five years. The plan shall contain vegetation management protocols, protocols for monitoring replanting success, and an adaptive management plan if success criteria are not being met. The adaptive management plan would include interim thresholds for replanting success and alternative management approaches, such as weed control, supplemental watering, or additional replanting to undertake if thresholds are not met.		• Annual monitoring reports throughout the monitoring period				
	Mitigation Measure 3.3-2b: Tree Mitigation. To mitigate for removal of any native trees in the project area or any trees greater than or equal to 6 inches located within the riparian corridor, the District shall replant trees on site, to the extent possible. The District will identify other suitable locations within the watershed if the project area is not large enough to support the replacement of all trees required for mitigation. If suitable mitigation sites are not located within the watershed, then additional sites will be identified within the County or beyond. All mitigation sites shall be coordinated with and approved by CDFW. The District may contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code to the extent allowed by CDFW. Mitigation ratios shall be developed in coordination with CDFW and the Town of Ross and shall vary according to both the type of tree impacted (i.e., tree species, whether or not the impacted tree is native to California or nonnative, and tree size) and the	• All areas where tree removal is required	• Tree Mitigation Plan implemented • Tree removal plan complies with Town of Ross and Marin County's tree removal requirements and CDFW tree replacement ratio requirements • CDFW approval for tree mitigation plan	• The District • Contractor	• Prior to construction • During construction • After construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	location of the mitigation planting (i.e., trees planted outside of the watershed may be subject to higher mitigation ratios). Impact mitigation ratios shall be a minimum of 1:1 for nonnative tree species to 3:1 for most native tree species or on a trunk-diameter basis per the Town of Ross Municipal code (i.e., 1:1 trunk diameter for trees in good or excellent condition [e.g., one 21-inch tree removed in good condition shall be replaced by new trees totaling 21-inch trunk diameter], 3:1 trunk diameter for trees in fair or marginal condition [e.g., one 21-inch tree removed in fair condition shall be replaced by new trees totaling 7-inch trunk diameter], and trees in poor condition shall be replaced with tree[s] totaling two inches in truck diameter), whichever is greater. Impact mitigation ratios for oak trees are expected to range from 4:1 (for impacted oak trees that are 5 to 10 inches dbh) to 5:1 (for impacted oak trees that are 10 to 15 inches dbh) and 15:1 (for impacted oak trees greater than 15 inches dbh). The District shall prepare a detailed Tree Mitigation Plan and obtain approval from CDFW for the Tree Mitigation Plan. Replacement oaks shall come from nursery stock grown from locally sourced acorns or from acorns gathered locally, preferably from the same watershed in which they are planted. The trees should be able to survive the last two years of the minimum five-year monitoring period without supplemental irrigation. If at any time the District identifies additional trees that need to be removed, the District shall first get written approval from CDFW, RWQCB, and the Town of Ross and the District shall revise the final plan to include additional tree plantings in accordance with agency-approved mitigation ratios. Based on final total of trees impacted by the project, the plan shall include the details of the number and species of trees to be planted, specific planting locations, maintenance and irrigation needs, monitoring requirements (i.e., five years monitoring plant vigor and growth), reporting requirements, and success criteria to be met before monitoring is concluded (e.g., survival rates, assessment of "good" overall tree vigor, and tree viability without irrigation). The plan shall be submitted to resource agencies for review and approval prior to implementation.						
Impact 3.3-3: The project would not have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.	**Mitigation Measure 3.3-1e: Invasive Plant Species Control (see above)**	• See above	• See above	• The District • Contractor	• During construction		
Impact 3.3-4: The project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or	**Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds and Mitigation Measure 3.3-2b: Tree Mitigation (see above)**	• See above	• See above	• The District • Contractor	• During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
impede the use of native wildlife nursery sites.							
Impact 3.3-6: The project would not introduce a new non-native or invasive species of plant or animal into an area.	**Mitigation Measure 3.3-6: Invasive Aquatic Species Control.** All heavy equipment that has operated in waters outside of the Corte Madera Creek watershed shall be steam-cleaned and inspected prior to entering the project area. Any in-channel equipment that could be used in other water bodies will be decontaminated following the completion of the project. In addition, all waders, wading boots, block nets, dip nets, and buckets used within Corte Madera Creek will undergo decontamination. Decontamination protocols will include: • Freeze equipment/gear for a minimum of 8 hours at temperatures at 26°F (-3°C) or below. • Soak equipment/gear in a bath of hot water (at least 120°F, 46°C) for 10 minutes. • Soak equipment/gear in a bath of a disinfectant containing quaternary ammonium compounds (QAC) (e.g., Quat 4, Quat 128, Super HDQ Neutral, etc.) for 10 minutes. The QAC-containing disinfectant should be diluted with water at a rate to achieve a minimum active QAC concentration of 0.4%. Six (6) ounces of disinfectant to gallon of water can be used as a disinfectant to water ratio (1:21). After removal from the bath, rinse equipment/gear thoroughly with tap water.	• Entire project area	• All heavy equipment that has operated in waters outside of the Corte Madera Creek watershed is inspected prior to entering the project area • In-channel equipment that could be used in other water bodies is decontaminated according to decontamination protocols	• Contractor	• During construction		
Cultural Resources							
Impact 3.4-2: The project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	**Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources.** If evidence of any subsurface archaeological features or deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find, and the finds shall be protected until they are examined by a qualified archaeologist. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone-milling equipment (e.g., mortars, pestles, handstones, milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls and deposits of metal, glass, and/or ceramic refuse. The District shall retain a qualified archaeologist who meets the U.S. Secretary of the Interiors professional qualifications in archaeology to assess the significance of the find and make recommendations for further evaluation and treatment as necessary. A Native American representative from a traditionally and culturally affiliated tribe will	• Entire project area • Area below Stadium Way	• Stop work within 50 feet of a find • Finds are protected and examined by qualified archaeologist • Implement specified procedures to avoid adverse effects to cultural resources • Native American representative is notified and invited to assess finds of Native American ancestry • California State Lands Commission is notified of discovery within the jurisdiction of State Lands Commission	• This District • Qualified archaeologist • Contractor • Native American representative • State Lands Commission	• During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	be notified and invited to assess the find if the artifacts are of Native American ancestry and determined to be more than an isolated find. If the discovery is in an area below Stadium Way and on lands under the jurisdiction of California State Lands Commission, that agency shall be notified. Any treatments and disposition of any artifacts uncovered under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission before the treatment is implemented. If, after evaluation, a resource is considered a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in PRC Section 21074), all preservation options shall be considered as required by CEQA (see CEQA Guidelines Section 15126.4 and PRC 21084.3), including possible capping, data recovery, mapping, or avoidance of the resource. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil. Work in the area may resume, at the direction of the District, upon completion of treatment. An Unanticipated Discoveries Evaluation and Treatment Plan shall be prepared before construction that details the procedures for dealing with unanticipated discoveries, including procedures that would be implemented for such discoveries that cannot be protected in place. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.						
Geology and Soils							
Impact 3.6-1: The project could directly or indirectly cause potential substantial adverse effects, including the risk or loss, injury, or death involving: i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42. ii. Strong seismic ground shaking. iii. Seismic-related ground failure, including liquefaction.	**Mitigation Measure 3.6-1: Geotechnical Investigation Report** The District shall have a professional geotechnical engineer conduct a geotechnical investigation to evaluate the potential for geotechnical hazards to occur on-site in accordance with the recommendations of the California Geological Survey. The Geotechnical Investigation Report shall provide site-specific recommendations for structures (e.g., floodwalls, fish pools, and stormwater pump station), work areas, and access routes where there is an elevated risk of geologic hazards. The Geotechnical Investigation Report shall be incorporated into the final project design of the retaining walls and floodwalls. The Geotechnical Investigation Report shall specify exact design coefficients that are needed by structural engineers to determine the type and sizing of structural materials. The Geotechnical Investigation Report shall be subject to performance criteria imposed by the California Building Code, as applicable. The Geotechnical Investigation Report shall be prepared by a registered civil engineer or certified engineering	• Entire project area	• Conduct site-specific geotechnical investigation • Implement geotechnical recommendations to address risk of seismicity	• The District • Geotechnical engineer • Contractor	• Prior to construction • During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
iv. Landslides.	geologist and include appropriate measures to minimize seismic hazards and ensure structural safety of the proposed structures.						
		Hydrology and Water Quality					
Impact 3.9-1: The project could violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality; or result in discharge of pollutants into surface or ground waters or other alteration of surface or ground water quality (e.g., temperature, dissolved oxygen or turbidity).	**Mitigation Measure 3.9-1: Conduct Soil/Sediment Testing.** Excavated and exposed soil and sediment at risk of erosion or mobilization will be tested for contaminants of potential concern (COPCs) for concentrations above SFBRWQCB's Environmental Screening Levels (ESLs) for shallow soils, where groundwater is not a drinking water source, for commercial land use. Additional sampling results shall be compared to the Total Threshold Limit Concentrations (TTLCs) specified in California Code of Regulations (CCR) Title 22 Chapter 11 for hazardous waste identification. Soils will be tested prior to initiation of excavation activities to determine appropriate treatment, storage, and suitability for on-site onsite reuse, landfill disposal, or hazardous waste disposal.	• Frederick Allen Park • ~~Unit 2 Lower College of Marin~~	• Test exposed soil and sediment • Remove/immobilize contaminated sediments • Comply with water quality standards or waste discharge requirements	• The District • Contractor	• During construction		
		Noise					
Impact 3.10-1: The project could result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	**Mitigation Measure 3.10-1: Construction Noise Reduction Plan**. The District would adhere to this requirement and develop a construction noise reduction plan in compliance with local regulations to include measures to reduce construction noise impacts. These measures shall include, but not be limited to, the following: 1. Distribute to the potentially affected residences and other sensitive receptors within 200 feet of project construction boundary a "hotline" telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise-disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant's name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project area of the construction schedule. 2. All construction equipment shall have intake and exhaust mufflers recommended by the manufacturers thereof. Further, pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof. In lieu of or in the absence of manufacturers' recommendations, the Director of Public Works shall have the authority to prescribe such means of accomplishing maximum noise attenuation as he deems to be in the public interest, considering the available technology and economic feasibility.	• Unit 4 • Frederick Allen Park • Stormwater Pump Station	• Noise reduction measures implemented to reduce noise levels • Nearby residents notified regarding noise activities and impacts	• The District • Contractor	• Prior to construction • During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	3. Maintain maximum physical separation between noise sources (construction equipment) and sensitive noise receptors. Separation may be achieved by locating stationary equipment to minimize noise impacts on the community. 4. Impact tools (e.g., jack hammers) used during construction activities will be hydraulically or electrically powered where feasible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. 5. Use construction noise barriers such as paneled noise shields, barriers, or enclosures adjacent to noisy stationary equipment such as generators, air compressors, jackhammers, ect. Noise control shields shall be made featuring a solid panel and a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.						
Impact 3.10-2: The project would not result in generation of excessive groundborne vibration or groundborne noise levels.	**Mitigation Measure 3.10-2: Vibration Reduction Measures.** The District shall design the project to avoid intense vibration activities within five feet of the structures at Frederick Allen Park (e.g., avoid use of large bulldozer, jackhammer, hoe ram, or loaded trucks). If intense vibration generating activities cannot be avoided in proximity to structures, vibration monitoring shall be conducted during grading and floodwall construction activities in Frederick Allen Park to confirm vibration levels do not exceed vibration thresholds at the nearest receptors. If vibration levels approach the threshold of 0.3 PPV at the nearest structure, then construction practices shall be modified (i.e., use smaller types of construction equipment, operate the equipment in a manner to reduce vibration, or use alternate construction methods) so that the threshold is not exceeded.	• Frederick Allen Park adjacent to commercial buildings	• Vibration activities and impact avoidance incorporated in project design • Vibration monitoring conducted according to the measure • Construction practices modified as needed to avoid exceeding the threshold	• The District • Contractor	• Prior to construction • During construction		
	Recreation						
Impact 3.12-3: The project could affect existing recreational opportunities.	**Mitigation Measure ~~3.1-2~~3.1-3: Large Tree Planting (see Aesthetics and Visual Resources above)**	• See above	• See above	• The District • Contractor	• Prior to construction • During construction		
	Mitigation Measure 3.12-3: Temporary Shade Structures The District shall coordinate with the Town of Ross to select the type and location for installation of temporary shade structures in Frederick Allen Park. The temporary shade structures shall be located along the edge of the Bike Route 20 multi-use path and at seating areas as needed to provide shade during the vegetation establishment period. The temporary shade structures shall be removed when the tree canopy has sufficiently established to provide afternoon shade of the pathway and as determined through coordination with the Town of Ross. The District will submit a draft plan for the shade structures to the Town of Ross no less than 60 days prior to construction.	• Frederick Allen Park	• Coordinate with Town of Ross on plan for shade structures • Install temporary shade structure along pathway and at seating areas according to the plan	• The District • Town of Ross • Constructor	• Prior to construction • During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
	Mitigation Measure 3.13-1: Traffic Management (see Transportation and Circulation below)	• See below	• See below	• Construction • Qualified traffic engineer	• Prior to construction • During construction		
			Transportation and Circulation				
Impact 3.13-1: The project could conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	**Mitigation: Mitigation Measure 3.13-1: Traffic Management** Prior to initiation of construction, the Project contractor(s) shall use a qualified traffic engineer to prepare a Traffic Management Plan (TMP). The TMP shall be developed on the basis of detailed design plans. The TMP shall be reviewed and approved by the District and agencies with jurisdiction over roadways affected by project construction activities prior to construction. Once approved, the TMP shall be incorporated into the contract documents specification. The TMP shall include, but not necessarily be limited to, the elements listed below: • Develop a detour plan for bicycle and pedestrian traffic that shows the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin Parking lot to Ross Common. • Post temporary Bike Route 20 detour and associated signage that meets all the accessibility requirements stated under the Americans with Disabilities Act and CBC Title 24. • Post signs providing public notice of detours at least ~~14~~ 20 days prior to temporary bike route closure. • Provide flaggers at the tennis courts within Frederick Allen Park to provide safe pedestrian access to the tennis courts. • Control and monitor construction-vehicle movements by enforcing standard construction specifications through periodic on-site inspections. • Install traffic-control devices where traffic conditions warrant, as specified in the applicable jurisdiction's standards (e.g., the California Manual on Uniform Traffic Control Devices; Part 6: Temporary Traffic Control); flaggers would be used, when warranted, to control vehicle movements. • Implement a public information program to notify interested parties of the impending construction activities using means such as print media, radio, and/or web-based messages and information. • Comply with roadside safety protocols to reduce the risk of accidents. • Maintain access for emergency vehicles at all times. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways. • Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner as to minimize obstruction to traffic.	• Entire project area	• TMP prepared • Notified public regarding construction activities and traffic impacts • Traffic control measures including detours implemented • Traffic control devices installed • Comply with roadside safety protocols • Emergency vehicle access maintained at all times • Equipment stored in designated areas to avoid obstructing traffic	• Construction • Qualified traffic engineer	• Prior to construction • During construction		

Significant Environmental Impact	Mitigation Measure	Applicable Location	Performance Criteria	Implemented By	Implementation Timing	Monitored By	Verified By (Date and Signature)
Impact 3.13-3: The project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	**Mitigation Measure 3.13-1: Traffic Management (see above)**	• Frederick Allen Pack • Stormwater Pump Station • Unit 3 Dewatering	• Implement traffic measures to detour or redirect traffic around the work area	• Construction • Qualified traffic engineer	• Prior to construction • During construction		
			Tribal Cultural Resources				
Impact 3.14-1: The project would not cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	**Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources (see Cultural Resources Above)**	• Entire project area	• Stop work within 50 feet of uncovered archaeological resources • Native American representative is notified and invited to assess finds of Native American ancestry • Treat tribal cultural resources according to PRC 21084	• This District • Qualified archaeologist • Contractor • Native American representative • State Lands Commission	• During construction		