TIJUANA ESTUARY TIDAL RESTORATION PROGRAM II PHASE I FINAL ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT
San Diego County, California

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ABSTRACT

This Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) has been jointly prepared by the California Department of Parks and Recreation pursuant to the California Environmental Quality Act (CEQA; Public Resources Code Section 21000 *et seq*.) and the U.S. Fish and Wildlife Service (USFWS) in cooperation with the U.S. Army Corps of Engineers pursuant to the National Environmental Policy Act (NEPA; 42 United States Code 4321 *et seq*.) to evaluate the environmental consequences of restoring 82 to 87 acres of native coastal wetlands and uplands within the Tijuana Estuary, located in southwestern San Diego County, California. Restoration would include increasing the tidal prism within the estuary and improving water and habitat quality to support healthy fish and wildlife populations. Two action alternatives and a No Project/No Action Alternative were analyzed at an equal level of detail in the DEIR/EIS, which was prepared pursuant to NEPA, with the USFWS as the NEPA lead agency, and pursuant to the California Environmental Quality Act (CEQA), with the California Department of Parks and Recreation as the CEQA lead agency.

Preparation of the FEIR/EIS considered the comments received during public scoping, as well as during the public comment period for the DEIR/EIS. A summary of all alternatives, information, and analyses submitted during the public comment period by State, Tribal, and local governments, and other public commenters for consideration by the lead and cooperating agencies is presented in Chapter 8 of the FEIR/EIS. A final decision on which alternative will be selected for implementation will occur no sooner than 30 days after the publication of the availability of the FEIR/EIS in the Federal Register.

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Prepared under the direction of the Lead and Cooperating Agencies by: AECOM
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SUMMARY

S.1 INTRODUCTION

This joint Final Environmental Impact Report and Environmental Impact Statement (FEIR/EIS) has been prepared by the California Department of Parks and Recreation (California State Parks; CSP) and the U.S. Fish and Wildlife Service (USFWS) in cooperation with the U.S. Army Corps of Engineers (Corps) for the Tijuana Estuary Tidal Restoration Program II Phase I (TETRP II Phase I or proposed project). This joint FEIR/EIS has been prepared in compliance with the California Environmental Quality Act (CEQA) (California Public Resources Code Section 21000 *et seq.*) as implemented by the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 1500–15387) and the National Environmental Policy Act (NEPA) as implemented by the Council on Environmental Quality Regulations (Title 40 Code of Federal Regulations [CFR] §§ 1500–1508 [40 CFR §§ 1500-1508], as revised per a final rule published in the Federal Register [87 FR 23453] on April 20, 2022, and effective on May 20, 2022). The DEIR/EIS was made available for public review and comment for 45 days, with the Notice of Availability published in the Federal Register (87 FR 51124) on August 19, 2022.

The comments provided during the public comment period have been considered and where appropriate incorporated into the analysis provided in the FEIR/EIS. The FEIR/EIS, which is intended to inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts, will be available for a 30-day review period, after which a Record of Decision will be published that identifies the preferred alternative.

In accordance with CEQA and NEPA, the FEIR/EIS tiers from the previous 1991 Tijuana Estuary Tidal Restoration Program EIR/EIS (TETRP EIR/EIS), which was certified by the California State Coastal Conservancy (SCH #881130221) in September 1992. The USFWS issued a Record of Decision in July 1993. TETRP II Phase I is the first phase of a larger restoration proposal considered in the original 1991 EIR/EIS.

S.2 LEAD AGENCY ROLES AND RESPONSIBILITIES

The proposed project's land ownership includes both state and federal jurisdictions. Due to the complexity and range of potentially significant impacts, a joint DEIR/EIS was prepared in accordance with CEQA and NEPA. CSP is the lead agency responsible for compliance with CEQA. The NEPA lead agency for this project is the USFWS. CSP and the USFWS agreed to jointly prepare the DEIR/EIS and FEIR/EIS to efficiently address the federal, state, and local requirements for environmental analysis and permitting. The Corps, based on its jurisdiction by

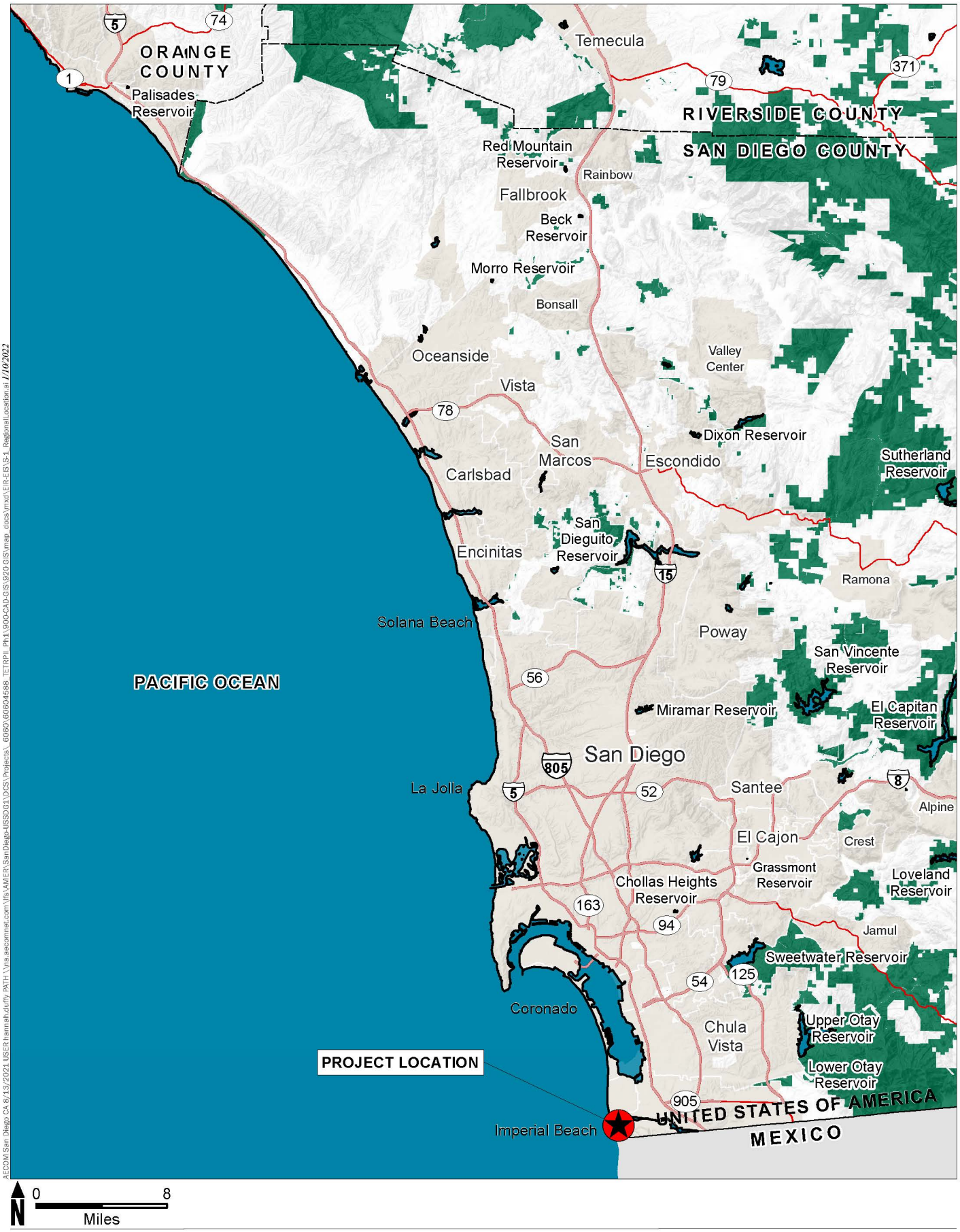
law and special expertise pursuant to Section 404 of the Clean Water Act (CWA), has participated in the review process as a cooperating agency.

S.3 PROJECT LOCATION AND SETTING

Tijuana Estuary is located at the southwest corner of the United States in San Diego County, California, where the Tijuana River drains an approximately 1,700-square-mile watershed, a large portion of which is located within Mexico (Figure S-1). The TETRP II Phase I project site is located in the southern arm of Tijuana Estuary and is encompassed by the Tijuana River National Estuarine Research Reserve (TRNERR or Reserve), which includes Border Field State Park and the Tijuana Slough National Wildlife Refuge (NWR or Refuge). The proposed project site extends into both Border Field State Park and Tijuana Slough NWR. TRNERR encompasses approximately 2,531 acres of tidal and non-tidal land.

Tijuana Estuary is the largest, most intact coastal wetland in the region. Despite development of the Tijuana River watershed and disturbances in the recent past, including an increased volume of frequently contaminated freshwater inputs, sedimentation, trash, and impacts from Border Patrol, military, and agricultural uses, Tijuana Estuary provides habitat for sensitive, threatened, and endangered plants and animals, including resident and migratory wildlife. The importance of this area's biological resources was recognized by the Secretary of the Interior in 1973 when a 1,569-acre portion of the Tijuana Estuary was designated a National Natural Landmark, referred to as the Tijuana River Estuary. In 2005, TRNERR was designated a Ramsar site, establishing it as a wetland site of international importance under the Ramsar Convention.

It is estimated that Tijuana Estuary at one time included over 2,500 acres of estuarine wetland and high marsh in the 1850s, and tidal influence extended over 1.5 miles inland. In the mid-1800s, extensive areas of intertidal mudflat and salt marsh existed in the northern, central, and southern arms of the estuary. Since then, considerable changes to the range of habitats and ecosystem function in the estuary have occurred with substantial negative effects to the structure and function of the wetland habitats and native wildlife species that depend upon them within the estuary. Overall, an approximately 50% decrease in subtidal and mudflat and a 42% decrease in salt marsh have occurred. Historical losses to the structure and function of estuarine wetlands have not been equally distributed throughout the estuary. The southern arm of the estuary has experienced major changes over the last 170 years, with dramatic conversion of subtidal and intertidal habitats to degraded non-tidal areas. The degradation of the southern arm of Tijuana Estuary served as the primary motivation for the initiation of TETRP.



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TETRP II Phase I EIR/EIS

FIGURE S-1 – REGIONAL LOCATION

In addition to the habitat changes, one of the primary functional changes within the estuary has been loss of tidal prism (i.e., the volume of water coming and going with the tides), which influences tidal velocities and in turn sediment scour and deposition. Prior to damming within the watershed and large-scale urban encroachment, the dendritic estuarine channels within the river valley were periodically redistributed by large-scale floods that historically maintained an open river mouth condition most of the time. Given present conditions, tidal prism is a key factor in keeping the river mouth open. With decreasing tidal prism, the estuarine and river mouth channels become smaller and the likelihood of closure at the river mouth increases due to oceanic current driven littoral sand deposition across the mouth of the river. Four closures of the entire river mouth and one at the southern tidal channel have been documented over the past decade (USFWS 2017). Closure of the river mouth and the loss of tidal exchange have resulted in severely degraded water quality as freshwater contaminated with untreated raw sewage caused rapidly developing eutrophication, excessive growth of bacteria and algae, and hypoxic conditions to develop in the estuary. Low oxygen levels have caused die-offs of fish and benthic invertebrates, and higher than normal water levels in the estuary flooded habitats of sensitive avian species. Since 2016, the USFWS has removed sand when the river mouth has closed or partially closed to provide continual tidal exchange within Tijuana Estuary.

S.4 DESCRIPTION OF PROPOSED PROJECT AND ALTERNATIVES

The 1991 TETRP EIR/EIS evaluated construction of a Model Marsh, Connector Channel (also referred to as Oneonta Tidal Linkage), and Oneonta Slough Widening as well as a 495-acre Restoration Project. Since that time, the Model Marsh and Connector Channel have been implemented and have contributed to less frequent closures at the river mouth than would have likely occurred had they not been constructed. Additionally, management strategies like dune berm management and overall restoration research have continued to provide and inform management strategies within TRNERR. TETRP II Phase I is the first phase of a multi-phase restoration of the southern arm of Tijuana Estuary as first evaluated in the overall Restoration Project component of the 1991 TETRP EIR/EIS. The proposed project discussed in this FEIR/EIS, TETRP II Phase I, builds upon the revised conceptual restoration plan developed in the Tijuana Estuary–Friendship Marsh Restoration Feasibility and Design Study completed in 2008, which proposed multi-phase restoration of approximately 250 acres of the estuary. TETRP II Phase I has been designed to restore approximately 82 to 87 acres within the study area to increase the tidal prism (amount of water coming and going with the tides) of the estuary by restoring habitat structure and function to salt marsh, mudflat, and tidal channels, as well as transitional and upland habitats that have been degraded over the past several decades.

Based on the historical studies and plans for Tijuana Estuary, as described in Tables 3-1, 3-2, and 3--3, and the project purpose and need and objectives as described in Section 1.3, two action alternatives have been developed. In the studies leading up to the development of the DEIR/EIS, these potential alternatives were generally titled Alternative 1 and Alternative 2. After comparing and

weighing the benefits and impacts of the feasible alternatives studied, the project team has selected Alternative 2 as the preferred alternative, subject to public review and input. For reader clarity throughout this FEIR/EIS, what was previously referenced through the alternative development process as Alternative 2 has been renamed to the "proposed project." Thus, Alternative 1 and the proposed project were analyzed in the DEIR/EIS at an equal level of detail. The DEIR/EIS included detailed analysis of the proposed project and alternatives (including Alternative 1 and the No Project/No Action Alternative). The primary differences between Alternative 1 and the proposed project include the total acreage of the restoration footprint; the amount of intertidal mudflat versus salt marsh habitat that would be restored; and the number of tidal connections to existing sloughs.

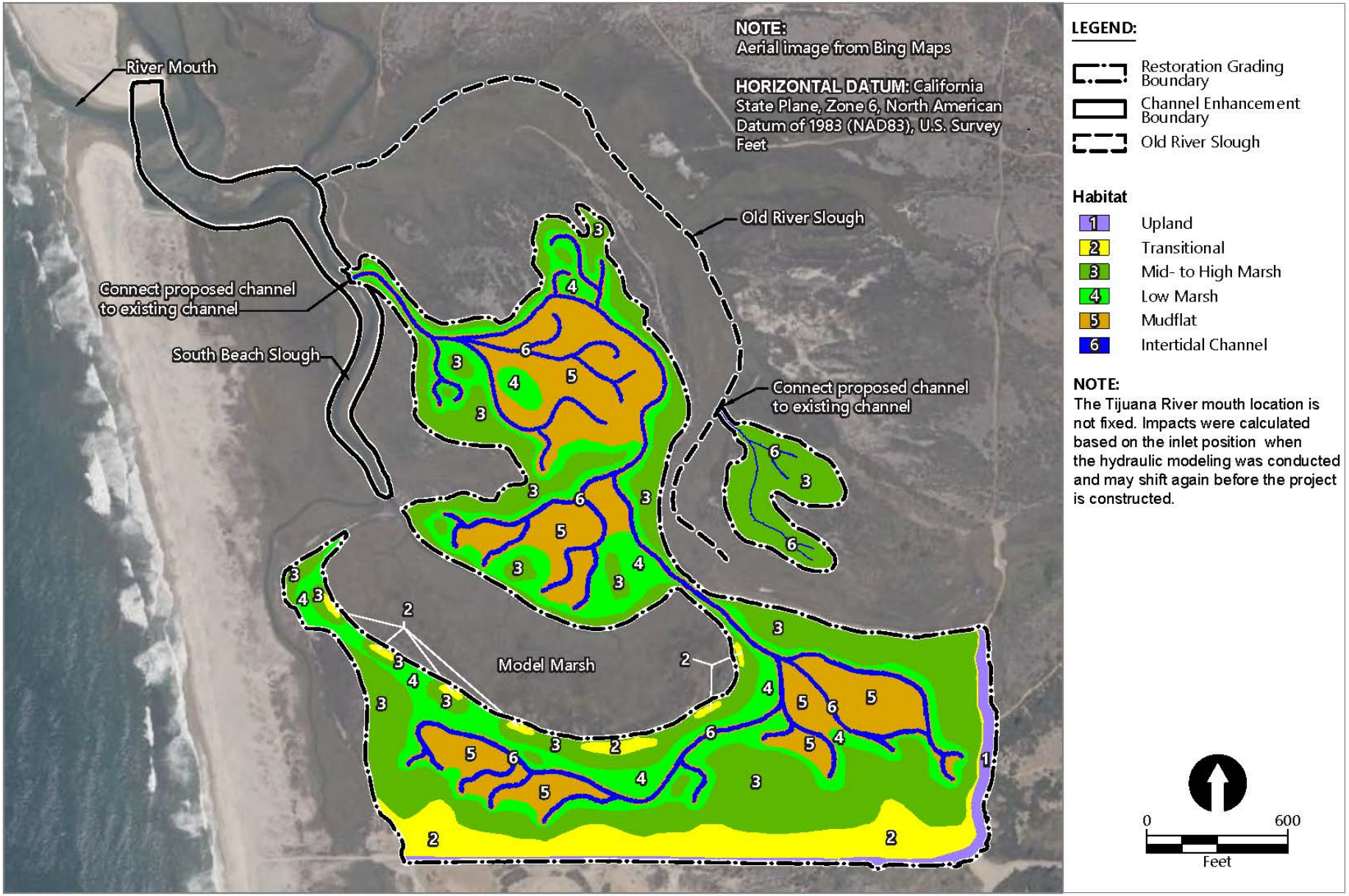
Alternative 1 and the proposed project would each include some common features, including the following:

- Access and staging area preparation and maintenance
- Restoration of predominantly disturbed portions of the southern arm of Tijuana Estuary to tidal wetlands within a specific restoration footprint
- Channel enhancement to provide connection to restored areas within a channel enhancement footprint
- A 20-foot temporary impact buffer around the channel enhancement footprint to allow for access
- A network of intertidal channels to convey tidal flows
- Connection of restored areas to Model Marsh
- Public access consolidation and rerouting outside of restored areas
- Incorporation of transitional and native upland areas within and/or adjacent to the restoration footprint
- Adaptive management after completion of restoration
- River mouth excavation, as needed, to provide tidal exchange within the estuary
- Soil management of excavated material from the restoration and channel enhancement area, emphasizing on-site beneficial reuse of material through beach nourishment within a beach placement footprint.

A more detailed discussion of Alternative 1 and the proposed project is included below.

Alternative 1

Alternative 1, which proposes to restore approximately 87 acres of native coastal habitats, was designed to maximize deeper intertidal habitats, such as mudflat, to increase tidal prism in the southern arm of the estuary. Alternative 1 includes areas of intertidal mudflat, low salt marsh, and mid- to high salt marsh; and native transitional habitat (wetland to upland) along the southern boundary of the project site and on the south side of Model Marsh (Figure S-2).



Source: Anchor QEA, 2021
606045881 3-1 Alternative 1 Proposed HabitatDistribution.ai dbrady 06/23/2022

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TETRP II Phase I EIR/EIS

FIGURE S-2
ALTERNATIVE 1 – HABITAT DISTRIBUTION

Alternative 1 would establish a network of intertidal channels to connect with existing tidal channels and the mouth of the Tijuana River. The primary tidal connection would be to the existing South Beach Slough, which feeds Model Marsh extending south of the river mouth. A smaller tidal connection located to the north and east of the main restoration area would connect to the existing Old River Slough to provide tidal influence for restored salt marsh habitat. To facilitate drainage of the restored wetlands during low tide, Alternative 1 would deepen the existing South Beach Slough.

The restored wetland area would be connected to the existing Model Marsh, providing hydraulic and functional connectivity between the two areas. Alternative 1 would provide high tide refugia for roosting and nesting marsh bird species by establishing islands of mid- to high salt marsh and transition zone habitats within the low salt marsh. Also under Alternative 1, the restoration footprint has been designed to avoid approximately 0.3 acre of transitional and 0.2 acre of native upland habitat that occurs immediately to the north of the restoration footprint between the South Beach Slough and the Old River Slough.

Estuarine and salt marsh wetland habitats require certain frequencies of tidal inundation to establish and survive as targeted sub-habitat types. These habitat breaks are driven by site elevations so excavation would be designed to specific elevations to establish the proposed wetland areas. Generally, habitats range in decreasing elevation from transitional, high to mid salt marsh, to low salt marsh, to mudflats, and finally to intertidal channels and subtidal (submerged) lands. The elevation range and acreage of each restored habitat under Alternative 1 are shown in Table S-1.

Table S-1
Habitats Restored Under Alternative 1

Habitat Type	Elevation Minimum (ft, NAVD 88)	Elevation Maximum (ft, NAVD 88)	Habitat Distribution (Acres)[1]
Native Upland	9.0	20+	2.6
Native Transitional	7.0	9.0	9.0
Mid- to High Salt Marsh	5.0	7.0	34.8
Low Salt Marsh	4.5	5.0	15.6
Mudflat	3.5	4.5	18.0
Intertidal Channel	2.0	3.5	6.8
Total	**-**	**-**	**86.8**

[1] An additional 0.5 acre of transitional and native upland habitat located immediately to the north of the restoration footprint would be avoided under Alternative 1 but restored to wetlands under the proposed project.

Excavation to restore wetland habitats under Alternative 1 would generate approximately 585,000 cubic yards (cy) of soil. Alternative 1 would reuse excavated material to establish higher elevation transitional areas within the restoration footprint (approximately 5,000 cy). Depending on the

characteristics of excavated material, the remainder (or portions thereof) could be used beneficially as a source of beach nourishment through beach or nearshore placement. Beach nourishment would allow for nourishment of the littoral cell as well as support the development and maintenance of coastal barrier dunes, providing a protective function for the proposed restoration area to the east. While maximizing beneficial reuse of material on-site as beach nourishment is preferred, if soil quality of some excavated material is not adequate (e.g., grain size characteristics and/or contaminants considered unsuitable for placement), material could be transported off-site for beneficial reuse at other project sites (e.g., Nelson Sloan Quarry) or for disposal (e.g., Otay Landfill).

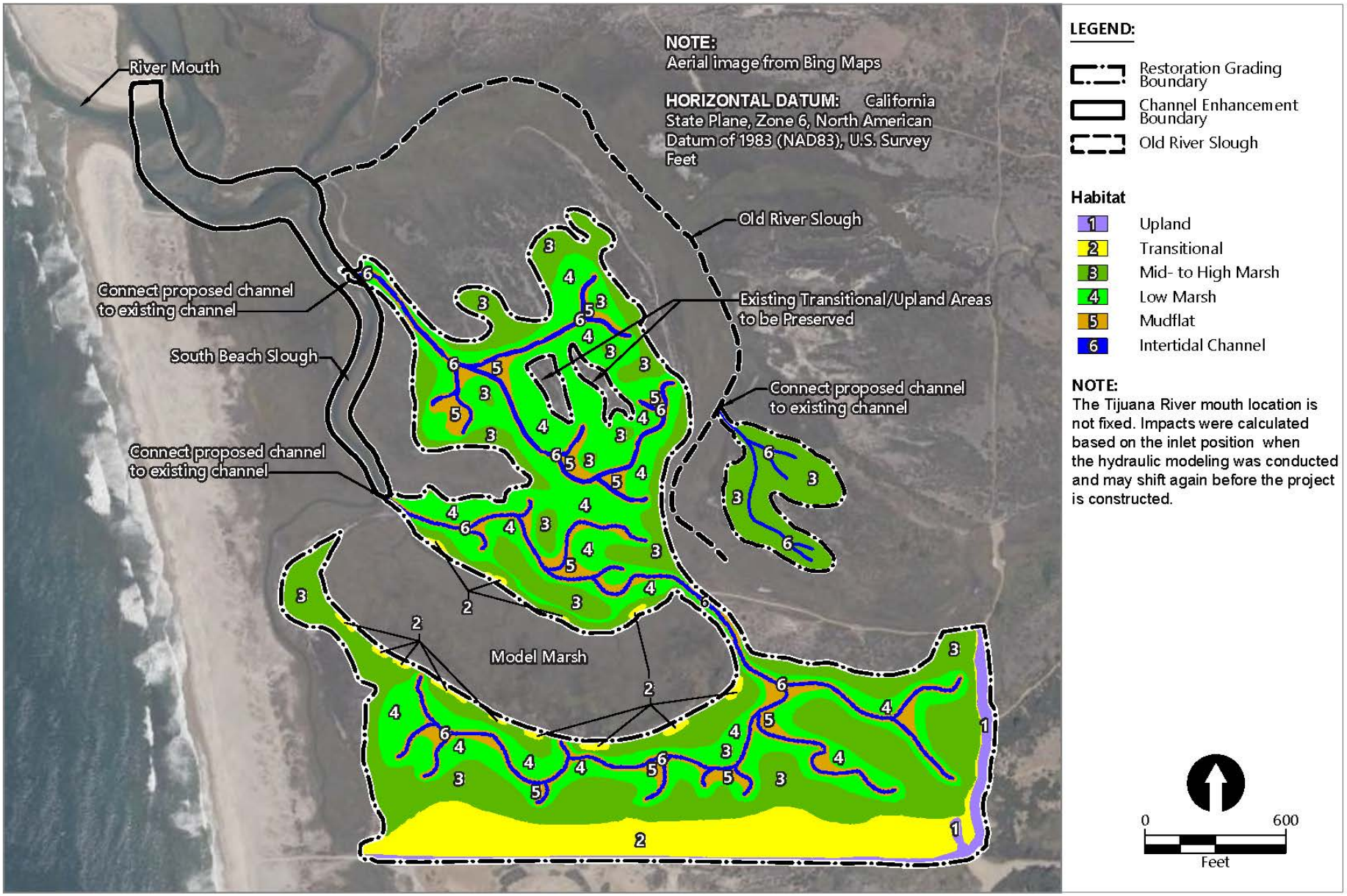
Proposed Project

The proposed project, which encompasses a restoration footprint of approximately 83.6 acres of disturbed upland, transitional, and high marsh habitat, proposes to restore approximately 82.5 acres of wetland habitats from primarily disturbed upland habitat within the project footprint, while also preserving 1.1 acres of transitional and upland habitat (Figure S-3) in the northern portion of the restoration footprint. An additional 3.5 acres of transitional habitat, located to the east of Model Marsh and south of Marsh Trail, an area that would be restored to wetlands under Alternative 1, would be preserved under this alternative.

Under the proposed project, a system of tidal channels would be established, with connections to existing tidal channels at three points, including two along the South Beach Slough and one at the Old River Slough. The primary tidal connection to the proposed project is the existing South Beach Slough, which would be deepened to increase tidal flows into the proposed restoration area. In addition, transition zone habitat would be restored along the southern portion of the restoration area and intermittently around the perimeter of Model Marsh. Compared to Alternative 1, the additional connection to existing tidal channels and smaller excavation volumes and grading area would result in a larger tidal prism overall within the estuary.

To facilitate drainage of the restored wetlands during low tide, the proposed project would deepen the existing South Beach Slough, similar to Alternative 1. The proposed project would also provide refugia for roosting and nesting birds by establishing islands of mid- to high salt marsh and transition zone habitats within the low salt marsh areas.

The elevations and acreage of each habitat proposed for restoration under the proposed project are presented in Table S-2.



Source: Anchor QEA, 2021

60604588\Figure 3-3 Alternative 2 Proposed Habitat Distribution.ai dbrady 06/23/2022

AECOM

San Diego County, California

TETRP II Phase I EIR/EIS

FIGURE S-3
PROPOSED PROJECT – HABITAT DISTRIBUTION

Excavation to restore native habitats under the proposed project would generate approximately 521,000 cy of soil. Approximately 7,000 cy would be used on-site to establish higher elevation transitional areas. As described for Alternative 1, the remainder of excavated soil would either be beneficially reused on-site for beach nourishment or transported off-site for beneficial reuse at other project sites or to the landfill for disposal.

Table S-2
Habitats Restored Under the Proposed Project

Habitat Type	Elevation Minimum (ft, NAVD 88)	Elevation Maximum (ft, NAVD 88)	Restored Habitat Distribution (Acres)	Preserved Habitat Distribution (Acres)[1,2]
Native Upland	9.0	20+	2.8	0.1
Native Transitional	7.0	9.0	11.8	1.1
Mid- to High Salt Marsh	5.0	7.0	33.5	-
Low Salt Marsh	4.5	5.0	22.9	-
Mudflat	3.5	4.5	6.4	-
Intertidal Channel	2.3	3.5	5.1	-
Total	**-**	**-**	**82.5**	**1.1**

[1] Totals may not sum due to rounding.
[2] An additional 3.5 acres of transitional habitat located outside the restoration footprint would be avoided under the proposed project, but restored to wetlands under Alternative 1.

Project Components Common to Alternative 1 and the Proposed Project

Soil Management

Establishment of proposed habitats requires the excavation and net export of soils from the restoration footprint and channel enhancement area with Alternative 1 requiring up to approximately 580,000 cy and the proposed project requiring approximately up to 514,000 cy. Soil management is therefore a large component of the project; five options have been identified for potential management of excavated soils and are the same for both alternatives. Tables S-3 and S-4 show the material volumes per each soil management option for each alternative.

Table S-3
Alternative 1 - Soil Management Earthwork Quantities by Option (cy)

Option	On-site: Transitional	On-site: Beach	Off-site: Nelson Sloan Quarry*	Off-site: Landfill
1	5,000	-	-	580,000
2	5,000	-	580,000	-
3	5,000	112,000	468,000	-
4	5,000	167,000	413,000	-
5	5,000	322,000	258,000	-

*or other approved project sites

Table S-4
Proposed Project - Soil Management Earthwork Quantities by Option (cy)

Option	On-site: Transitional	On-site: Beach	Off-site: Nelson Sloan Quarry*	Off-site: Landfill
1	7,000	-	-	514,000
2	7,000	-	514,000	-
3	7,000	101,000	413,000	-
4	7,000	158,000	356,000	-
5	7,000	305,000	209,000	-

*or other approved project sites

Option 1 – Landfill Disposal

Under Option 1, excavated materials may be transported to Otay Landfill for disposal, either in combination with or independent of beneficial reuse soil management strategies. Beach and South Beach Trails, as well as Monument Road, would be used for transport to Otay Landfill, with connections to Interstate 5 via either Hollister Street to Tocayo Avenue and/or Dairy Mart Road. Under this option, up to 254 truck trips per day (round trips) could be generated under Alternative 1, while up to 225 truck trips per day (round trips) could be generated under the proposed project.

Option 2 – Nelson Sloan Quarry or Another Approved Project Site(s)

Under Option 2, material would be transported via dump trucks using Beach and South Beach Trails and Monument Road for delivery to Nelson Sloan Quarry, where the material would be beneficially reused within the quarry as part of the proposed Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project. This form of beneficial reuse could occur either in combination with or independent of disposal at a landfill, and/or could occur in association with other beneficial reuse soil management strategies, as described below. In addition, some or all of the 580,000 cy of material generated under Alternative 1 or the 514,000 cy of material generated under the Proposed Project could potentially be transported for beneficial reuse at other approved project sites. Volumes similar to those identified for Option 1 would be required for transport, and the number of truck trips is assumed the same for both options. The duration for transport under Option 2 would be the same as Option 1 but would occur over a shorter distance, given the closer proximity of Nelson Sloan Quarry.

Options 3 through 5 – Beach Placement

Options 3 through 5 would prioritize beach nourishment and would place suitable excavated material within the swash zone (i.e., where the waves meet the sand) or on dry portions of the beach depending on ultimate sand content and grain size of material available for beneficial reuse. This strategy is preferred because it would support the project objective of beach restoration and would support barrier dune development as well as minimize the need for transport of material using public roads to the east of the project site. The grain-size thresholds for each option—Option 3 (≥ 90% sand), Option 4 (≥ 75% sand), and Option 5 (≥ 51% sand)—allow for a range of possible scenarios for beneficial

reuse incorporating a beach nourishment component. The material used must be considered suitable for beach nourishment by the responsible regulatory agencies (i.e., Corps, California Coastal Commission [CCC], San Diego Regional Water Quality Control Board [RWQCB]).

Materials considered suitable for placement would be transported from the restoration site to the beach via dump trucks along the existing Beach Trail. Thresholds for beach placement Options 3 through 5 are outlined in Tables S-3 and S-4 and include:

- Option 3 – ≥ 90% Sand – beach placement in the upper beach.
- Option 4 – ≥ 75% Sand – beach placement in the upper beach.
- Option 5 – ≥ 51% Sand – beach placement both in the swash zone (51% to 74% sand) and upper beach (≥75%).

Options 3 through 5 allow for incrementally increasing volumes of excavated material to be beneficially reused for beach nourishment. Under Option 3, material with 90% sand or more would be reused, while Option 4 would increase that volume to allow for material with more than 75% sand to be reused. Option 5 is the most inclusive and would allow for the most beneficial reuse; it would include material containing more than 51% sand to be used for beach nourishment. Material with more than approximately 75% sand would be proposed primarily for placement on the dry beach avoiding areas supporting dune building plant species, while material with lower proportions of sand (51% to 74%) would be proposed for placement in the swash zone. Trucks would bring sand to the beach where bulldozers and similar equipment would spread the material across the beach profile or place in the swash zone. High tides and waves would then redistribute the material after placement.

Material removed from existing channels may also be dredged and transported via pipeline to the beach for nourishment purposes through the river mouth or along Beach Trail. To minimize turbidity during placement on the beach via a pipe, a temporary work berm would be constructed parallel to the shoreline to form a settling basin where dredged material would be discharged. Pipeline placement may shift/move up and down the coast to fill in material throughout the beach placement footprint. Once material is placed along the beach, equipment such as bulldozers, scrapers, and graders may be used to spread material evenly throughout the beach placement footprint.

Staging/Haul Route

A staging area would be established for the proposed project and Alternative 1 south of Beach Trail, primarily within existing disturbed salt panne habitat. Access routes such as Monument Road and Beach and South Beach Trails would be used to gain entry to the project site. Existing access road preparation and/or maintenance may be required to provide adequate and safe access for construction vehicles. Activities associated with preparation and maintenance during construction would remain within existing road edges where there is current access. A 12-foot-wide road along the east side of

the site would also be temporarily established to access the isolated restoration area located along the Old River Slough. While this access road would be located within the restoration site and existing disturbed areas to the extent possible, it would require some temporary expansion into existing habitat. After implementation, staging and haul route areas would be restored to the original pre-construction conditions and/or better (e.g., planted with native species).

As-Needed Removal of Sand from the River Mouth

Periodic as-needed removal of sand from the estuary's river mouth to provide continual tidal exchange is proposed to continue as a post-restoration management component of the project and is currently a part of the ongoing management activities within the estuary in accordance with an existing Corps permit issued to the USFWS in 2018. Removal of sand, which would involve excavating accumulated sand and/or sediment at the mouth of the river, may occur under both Alternative 1 and the proposed project and is evaluated as part of TETRP II Phase I. Excavation would extend upstream for up to 500 linear feet and include an area up to 20 feet in width within the main river channel. Material removed from the channel is expected to consist almost exclusively of sand that enters the river mouth primarily from littoral cell transport and wave action and would continue to be suitable for placement on the beach. The proposed activity includes removal of up to 10,000 cy of sand, as needed, from the river mouth. The sand would be placed on adjacent unvegetated barrier dunes or along the shoreline either north or south of the mouth of the estuary above the high tide line. Access to the north side of the river mouth would be from the south end of Seacoast Drive in Imperial Beach or from the south via designated trails (i.e., Beach/South Beach and Coast North/South Trails). Equipment would drive along the high tide line of the beach until reaching the river mouth. Land-based equipment such as excavators and front-end loaders would be used to remove and transport the material from the river mouth and deposit it along the upper reaches of the beach.

Project Design Features and Standard Construction Measures

Due to the wetland habitat restoration nature of the project, an effort has been made to proactively incorporate measures into the project to minimize and avoid, where possible, impacts to natural resources. These project design features (PDFs) represent a commitment by the project proponents to construct the project in an environmentally sensitive way. Many features also address regulatory or code requirements. Inclusion of these project design features is considered in the determination of CEQA and NEPA conclusions as discussed in Chapter 4. These features are summarized in Table 3-9 and include the purpose, timing, and responsibility for implementation of each project design feature.

Construction within the proposed restoration and channel enhancement area would primarily involve removing vegetation and altering existing ground elevations. Construction methods for the project, including soil management, were developed based on project requirements and site constraints, as

well as experience with similar previous projects. Standard construction practices would be utilized for the project and are described in Table 3-10.

No Project/No Action Alternative

Under the No Project/No Action Alternative, the proposed TETRP II Phase I restoration of the estuary would not be completed. No removal of soil or vegetation would occur to restore or establish habitat within the project site. New or widened channel connections would not be implemented. No comprehensive maintenance regime or adaptive management plan would be implemented. Periodic removal of sand from the estuary's river mouth could continue to occur under separate approvals, but activities would be restricted to the river mouth and would not extend into the estuary.

ENVIRONMENTAL CONSEQUENCES

An analysis of environmental impacts that may be caused by Alternative 1 and the proposed project was conducted for the DEIR/EIS. Eighteen environmental issue areas are analyzed in detail in Chapter 4. Table S-5 provides a summary of the potentially significant impacts to the environment that would result under CEQA and NEPA during construction and operation of Alternative 1 and the proposed project. The table also presents the mitigation measures proposed to lessen potential environmental impacts, along with the extent of the environmental impacts that would remain after implementation of the proposed mitigation. Impact conclusions presented within Table S-5 are consistent between Alternative 1 and the proposed project.

Alternative 1 and the proposed project would result in significant environmental effects which cannot be avoided (CEQA § 15126.2(c)). These environmental effects relate to the topic areas of Water Quality (within Hydrology and Water Quality analysis), due to the potential for release of bacteria during beach nourishment activities; Biological Resources, due to construction activities and the potential temporary disturbance to wildlife; and Air Quality, due to the potential for fugitive dust emissions during implementation of Alternative 1 and the proposed project. Significant effects to the environment identified under NEPA would include issues related to Water Quality (within Hydrology and Water Quality analysis) and Biological Resources.

The DEIR/EIS identified potentially significant impacts under CEQA requiring mitigation that could be reduced to less than significant for Cultural Resources, Tribal Cultural Resources, and Hazardous Materials and Public Safety. Significant effects under NEPA would be avoided by the implementation of mitigation measures to protect Cultural Resources and to minimize potential effects related to Hazardous Materials and Public Safety.

Table S-5
Summary of Environmental Impacts

Activity	NEPA Conclusions	CEQA Significance Determination	Mitigation Measure Summary	CEQA Level of Significance after Mitigation
Land Use				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Recreation and Public Access				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Hydrology and Water Quality				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	Significant effect	Significant (temporary)	Implementation of mitigation measures Water Quality-1 and Water Quality-2.	Significant and unavoidable
Coastal Processes				
Restoration/Enhancement	Not applicable	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Hazardous Materials and Public Safety				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Significant (temporary)	Implementation of mitigation measure Haz Mat-1.	Less than Significant
Biological Resources				
Restoration/Enhancement	Significant effect	Significant (temporary)	No feasible mitigation available	Significant and unavoidable
Soil Management	Significant effect	Significant (temporary)	No feasible mitigation available	Significant and unavoidable
Geology and Soils				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Cultural Resources				
Restoration/Enhancement	No significant effect	Significant	Implementation of mitigation measures Cultural-1 through Cultural-5.	Less than Significant

Activity	NEPA Conclusions	CEQA Significance Determination	Mitigation Measure Summary	CEQA Level of Significance after Mitigation
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Tribal Cultural Resources				
Restoration/Enhancement	Not applicable	Significant	Implementation of mitigation measures Cultural-2 through Cultural-5.	Less than Significant
Soil Management	Not applicable	Less than Significant		Less than Significant
Paleontological Resources				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Visual Resources				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Transportation				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Air Quality				
Restoration/Enhancement and Soil Management	No significant effect	Significant (temporary)	Implementation of mitigation measure AQ-1.	Significant and unavoidable
Greenhouse Gas Emissions				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Noise				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than significant	None required	Less than Significant
Socioeconomics/ Environmental Justice				
Restoration/Enhancement	No significant effect	Not adverse	None required	Not adverse
Soil Management	No significant effect	Not adverse	None required	Not adverse
Public Services and Utilities				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant
Energy				
Restoration/Enhancement	No significant effect	Less than Significant	None required	Less than Significant
Soil Management	No significant effect	Less than Significant	None required	Less than Significant

The DEIR/EIS identified less than significant CEQA impacts and no significant impacts pursuant to NEPA related to Land Use, Recreation and Public Access, Coastal Processes, Geology and Soils, Paleontological Resources, Visual Resources, Transportation, Greenhouse Gas Emissions, Noise, Socioeconomics/Environmental Justice, Public Services and Utilities, and Energy.

The following topic areas were considered and found not to be significant under CEQA, as detailed in Section 7.2 of this FEIR/EIS. These topics were also not included in the full analysis of the 1991 Program EIR: Agricultural and Forestry Resources, Mineral Resources, Population and Housing, and Wildfire.

AREAS OF CONTROVERSY

Comments received during the public scoping process did not result in the identification of novel, potentially controversial topics of concern; however, comments raised during scoping did identify the following primary issues of concern: air quality/greenhouse gases/sea level rise, hydrology and water quality, biological resources, recreation and public access, hazardous materials and public safety, cultural/Tribal resources, land use, permitting, and cumulative effects.

SUBMITTED COMMENTS, ALTERNATIVES, INFORMATION, AND ANALYSES

Six comment letters were received during the 45-day public comment period for the DEIR/EIS. A range of issues were addressed in the comment letters including, but not limited to, effects to biological resources, water quality, and recreational uses. Discharge of material into aquatic resources and issues of environmental justice were also addressed. The comments and accompanying responses are provided in Appendix D. In addition, Chapter 8 includes a summary of all alternatives, information, and analyses submitted by State and local governments and other public commenters for consideration by the lead and cooperating agencies. No comment letters were received from Tribal governments, but coordination with affected Tribes was conducted prior to the public comment period, as described in Sections 4.8 and 4.9.

ISSUES TO BE RESOLVED

The selection of a preferred alternative to be implemented on the project site will be made based on the analysis in the FEIR/EIS, which includes consideration of the comments provided during the public review period for the DEIR/EIS. A final decision on which alternative will be moved forward for implementation will be described in the Record of Decision as part of the NEPA process, and upon adoption of the Findings and Statement of Overriding Considerations as part of the CEQA process. In addition, CSP will certify the Final EIR and adopt the Mitigation Monitoring and Reporting Program at the time of project approval.

Additionally, prior to project implementation, the following agencies may be required to determine their concurrence to issue the following decisions, approvals, and/or permits:

- CCC Coastal Development Permit/Federal Consistency Determination
- Corps CWA Section 404 Nationwide Permit 27, and others, if appropriate, or an Individual 404 Permit, as determined by the Corps
- San Diego RWQCB CWA Section 401 Water Quality Certification
- USFWS Refuge Special Use Permit
- Consultation with USFWS and National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service pursuant to Section 7 of the Federal Endangered Species Act
- Consultation with NOAA pursuant to the Marine Mammal Protection Act and the Magnuson-Stevens Act (Essential Fish Habitat)
- Consultation with the California Department of Fish and Wildlife (CDFW) pursuant to Section 2081 of the California Endangered Species Act
- USFWS consultation with the State Historic Preservation Officer/Tribal Historic Preservation Officer and other consulting parties, as applicable, under Section 106 of the National Historic Preservation Act (Section 106)
- Notification to California State Lands Commission regarding actions proposed on land leased to the USFWS for use and maintenance as an NWR
- Consultation between California Native American Tribal governments and lead agencies pursuant to California Assembly Bill 52

CHAPTER 1.0
INTRODUCTION

1.1 TYPE, PURPOSE, AND INTENDED USE OF THE JOINT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT

1.1.1 CEQA/NEPA Lead Agencies

The Tijuana Estuary Tidal Restoration Program II Phase I (TETRP II Phase I or proposed project) is being evaluated pursuant to both the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) as it requires federal, state, and local discretionary actions and will be implemented on both state land and federal land, specifically state land within the boundaries of Border Field State Park and federal land within the boundaries of the Tijuana Slough National Wildlife Refuge (NWR or Refuge). Under CEQA, a lead agency is defined as any public agency that is principally responsible for carrying out or approving a project. California Department of Parks and Recreation (California State Parks; CSP), as defined under CEQA Guidelines Section 15050, is the lead agency responsible for compliance with CEQA. Under NEPA, a lead agency is the agency preparing or taking primary responsibility for the preparation of an Environmental Impact Statement (EIS). The NEPA lead agency for this project is the U.S. Fish and Wildlife Service (USFWS), and authority for this action is the National Wildlife Refuge Administration Act, as amended (16 United States Code (U.S.C.) 668 §§ *et seq.*). The U.S. Army Corps of Engineers (Corps), based on its jurisdiction by law and special expertise pursuant to Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344), has agreed to participate as a Cooperating Agency, pursuant to Title 40 of the Code of Federal Regulations, Section 1501. 8 (40 CFR § 1501.8), on the preparation of this document.

California State Parks, the USFWS, and the Corps, as lead and cooperating agencies, participated in the preparation of the Draft and Final joint Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) pursuant to the requirements of CEQA and NEPA. The joint FEIR/EIS facilitates full disclosure of significant environmental impacts and informs decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts associated with restoring between 82 and 87 acres of coastal wetlands and associated native coastal uplands in the southern arm of the Tijuana Estuary. Future permitting agencies (e.g., Corps, Regional Water Quality Control Board, California Coastal Commission) will also rely on the analysis provided in the FEIR/EIS to facilitate their permitting process.

Project design and implementation has and will continue to involve coordination with numerous partners. The lead agencies, California State Parks and the USFWS, are the owners of the lands proposed for restoration and the entities responsible for compliance with CEQA and NEPA, respectively. Southwest Wetlands Interpretive Association (SWIA) with funding from the California

Wildlife Conservation Board and California State Coastal Conservancy has participated as a project partner responsible for faciliting restoration planning, and is anticipated to continue in this partnership role through preparation of final restoration plans, permit coordination, and construction.

The proposed restoration project constitutes a major federal action in accordance with NEPA as one or more aspects of project implementation have the potential to significantly affect the quality of the human environment. The joint FEIR/EIS facilitates full disclosure of significant environmental impacts and informs decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts. CSP and the USFWS have jointly prepared this FEIR/EIS, and the Corps is acting as a Cooperating Agency, to efficiently address the federal, state, and local requirements for environmental analysis and permitting. If final project design differs substantially from what is presented herein, additional environmental review may be required pursuant to CEQA Guidelines and/or federal NEPA regulations (40 CFR§ 1502.9(d)(1)(i)).

1.1.2 Tiered EIR/EIS Document

Tiering of environmental documents is allowed by Section 15152 of the CEQA Guidelines. Tiering generally refers to instances where an earlier, broader, programmatic environmental document covers the general impacts of a program or large-scale project. Then, subsequent environmental documents for a related individual project can be concentrated on the issues specific to that later project, changed conditions, or unanalyzed issues. CEQA encourages the use of tiered environmental documents as they can eliminate repetitive analyses of issues that were addressed in the earlier programmatic EIR, thus reducing time and excessive paperwork in the review process. NEPA also encourages tiering in a manner similar to CEQA per 40 CFR § 1501.11, stating that tiering "is appropriate when it helps the lead agency to focus on the issues that are ripe for decision and exclude from consideration issues already decided or not yet ripe."

In accordance with CEQA and NEPA, this FEIR/EIS was prepared as a tiered document to the previous Tijuana Estuary Tidal Restoration Program EIR/EIS (TETRP EIR/EIS), which was certified by the California State Coastal Conservancy (Conservancy) (SCH #881130221) in September 1992 and with a Record of Decision issued by the USFWS in July 1993. The 1991 TETRP EIR/EIS evaluated a restoration program for Tijuana Estuary that included a Model Project composed of construction of a Model Marsh, Connector Channel, and Oneonta Slough Widening, as well as a 495-acre Restoration Project. The TETRP EIR/EIS stated that funding was secured at that time for the Model Project and that implementation of the 495-acre Restoration Project component would require supplemental environmental documentation. Since that time, Model Marsh and Connector Channel (also referred to as Oneonta Tidal Linkage) have been implemented and the proposed Oneonta Slough Widening was not pursued due to potential impacts to wetland habitats. The proposed project is the first phase of the larger Restoration Project considered in the original 1991 EIR/EIS.

TETRP II Phase I is an appropriate related project for a tiered EIR/EIS document as it is within the scope of the project originally anticipated and described in the 1991 TETRP EIR/EIS. The footprint of TETRP II Phase I is generally within the area originally designated for restoration; however, the overall restoration proposal, although similar to that described in the 1991 TETRP EIR/EIS, includes appropriate revisions based on lessons learned and best practices for successful coastal wetland restoration developed within the last 25 years. Future phases may continue to expand on the efforts in this proposed project, as outlined in the larger potential restoration area identified in the 1991 EIR/EIS, and may require independent environmental documentation.

Given the passage of time since the analysis in the 1991 TETRP EIR/EIS and the development of project-specific details for the proposed project, this tiered EIR/EIS is necessary to consider changes to the current existing conditions of the area that may be affected in a new, different, or more severe manner than originally identified. This environmental document considers the impacts and associated mitigation outlined in the 1991 TETRP EIR/EIS to determine if those impacts and mitigation are still valid and applicable. In addition, issues specific to TETRP II Phase I, including new or modified impacts and necessary mitigation measures, have been identified through this project-specific analysis. An Initial Study was not prepared for the TETRP II Phase I project, rather relevant issue areas are considered for evaluation. Those effects found to be examined at a sufficient level of detail in the prior EIR/EIS are not reanalyzed in depth to avoid excessive repetition. Information from the 1991 TETRP EIR/EIS is incorporated by reference into this environmental document.

1.2 PROJECT OVERVIEW AND BACKGROUND

The historical ecology of Tijuana Estuary has been well documented, depicting the general state of the River Valley in the mid-1800s and changes that have occurred since then (Safran *et al.* 2017). It is estimated that Tijuana Estuary included over 2,500 acres of estuarine wetland and high marsh in the 1850s, and tidal influence extended over 1.5 miles inland. At that time, extensive areas of intertidal mudflat and salt marsh existed in the northern, central, and southern arms of the estuary. Since then, considerable changes to the range of habitats and ecosystem function in the estuary have occurred. Overall, an approximately 50% decrease in subtidal and mudflat habitats has occurred, and a 42% decrease in salt marsh. In addition, the dune system, which prior to the mid-19th century historically fringed the estuary on the west as a double ridge dune, has become a simplified single-ridge dune that has become flattened and migrated inland by up to 650 feet (Safran *et al.* 2017).

One of the primary functional changes within the estuary has been loss of tidal prism (the volume of water coming and going with the tides), which influences tidal velocities and, in turn, sediment scour, deposition, and water quality. Tidal prism is a key factor controlling the status of the river mouth. With decreasing tidal prism, the likelihood of closure at the river mouth due to sediment

deposition increases. It is estimated that prism has decreased anywhere from 55% to 85% since the mid-1850s (Safran *et al.* 2017).

An analysis of the conditions at the river mouth from 1849 to 1960 indicates that closures were historically an extremely rare event in Tijuana Estuary, with one identified closure in 1935 and a potential closure in 1886; however, the details are unclear (Safran *et al*. 2017). Several closures of the entire river mouth or the southern tidal channel have been documented over the past decade, including closures in 2010, March/April, May and September of 2016, and April 2017 (USFWS 2017). In the past, closure of the river mouth and the loss of tidal exchange resulted in severely degraded water quality as freshwater contaminated with untreated raw sewage caused rapidly developing eutrophication, excessive growth of bacteria and algae, and hypoxic conditions to develop in the estuary. Low oxygen levels caused die-offs of fish and benthic invertebrates, and higher than normal water levels in the estuary flooded nests and high-tide refugia of the endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*).

The USFWS has removed sand when the river mouth has closed or partially closed to provide continual tidal exchange within Tijuana Estuary, including reopening the river mouth during a winter closure between 1983 and 1984. Since 2016, the USFWS is authorized to remove up to 10,000 cubic yards (cy) of sand each year from the river mouth, in accordance with a permit from the Corps, to minimize the potential for negative impacts of closures that adversely affect the ecological health of the estuary. The sand is then placed on the adjacent beach above the mean higher high-water line. This activity is anticipated to be required into the future on an as needed basis, although potentially at a lower frequency as restoration occurs and the tidal prism increases.

Historical changes to habitats have not been equally distributed throughout the estuary. In the northern arm (known as Oneonta Slough), farthest away from extensive sediment loading from erosion in Tijuana, habitat change has been relatively modest. Elevations have increased over time, however, causing shifts from subtidal and mudflat to intertidal vegetated marsh and a general narrowing of intertidal channels. Previous restoration has improved conditions in this area by the restoration of salt marsh and the creation of a tidal channel to improve tidal circulation (Nordby 2018).

The southern arm of the estuary that follows one historical path of the Tijuana River has experienced major changes over the last 170 years, with dramatic conversion of subtidal and intertidal habitats to degraded non-tidal areas (Safran *et al.* 2017). The degradation of the southern arm of Tijuana Estuary has been well documented since the 1980s and served as the primary motivation for the initiation of TETRP (Safran *et al.* 2017, Nordby 2018). In *The Ecology of the Tijuana Estuary; An Estuarine Profile*, Zedler and Nordby (1986) documented historical land uses in the southern end of the estuary, including farming and military activities, that resulted in direct filling and loss of wetland habitats. The Tijuana River National Estuarine Sanctuary Management

Plan (Dobbin Associates 1986) concluded that the estuary had experienced a broad range of disturbances both directly on-site and indirectly through modifications of its watershed. Specifically, untreated sewage discharges from Mexico, hyper-salinity associated with closure of the river mouth in the winter of 1983–1984, unseasonal discharges from Rodriguez Reservoir in Mexico, inland migration of the barrier beach that separates the estuary from the ocean, and deposition of sediment borne by flows from trans-border canyons have contributed to the degradation of the southern arm of the estuary.

By the late 1980s, erosion and sedimentation associated with trans-border canyons and trans-boundary flows were recognized as critical physical factors contributing to the loss of habitat in southern Tijuana Estuary (CONCUR 2000). Goat Canyon, with 90% of its watershed in Mexico, was identified as a source of sediment that had filled tidal channels and converted salt marsh to upland habitats dominated by nonnative plant species. The development of plans to manage sediment on a local and watershed basis was categorized as a high-priority management objective.

In 1988, the Conservancy funded TETRP in response to the 1986 Management Plan and subsequent analyses that documented the decline in resource values and the need for restoration in the estuary. An EIR/EIS was completed in 1991 (ENTRIX *et al.* 1991) following a series of biological and hydrological studies of the estuary. Those studies concluded that a rapid and perhaps catastrophic loss of sensitive biological resources could occur unless action was taken to reverse the trends of habitat loss and deterioration. The key findings of the 1991 TETRP EIR/EIS were:

- Wetland habitats at Tijuana Estuary have been reduced in area by approximately 60% while the tidal prism of the estuary has been reduced by about 55% to 85% (see also Safran *et al*. 2017).
- The reduction in tidal prism has affected tidal scouring and deposition of sediment at the river mouth, causing it to become unstable and susceptible to closure.
- The reduction in tidal prism has been caused by the following:
  - Sedimentation during episodic flooding of the Tijuana River;
  - Sedimentation in intertidal mudflats and conversion to intertidal marsh plain;
  - Sedimentation from tributaries to the Tijuana River due to watershed instability;
  - Inland migration of the barrier beach due to the effects of sea level rise and associated changes in wave climate, destabilization of barrier dunes due to vegetation damage by recreational vehicles, and dune overwash during periods of severe wave action; and
  - Filling and road construction within the estuary.

The 1991 TETRP EIR/EIS concluded that "if no action is taken, it is possible that within two decades substantial additional tidal prism will be lost resulting in the nearly permanent closure of the river mouth and the conversion of the remainder of the wetland to salt flats or stagnant brackish and freshwater marsh."

The 1991 TETRP EIR/EIS recommended excavation and restoration of approximately 495 acres of wetlands to increase the tidal prism to its 1852 volume; construction of various phased project components, such as the constructed Model Marsh and Connector Channel in the northern arm of the estuary, as well as the Oneonta Slough Widening project that was not constructed; construction of training levees along the river; and reestablishment of dune vegetation on the barrier beach. Additionally, several sediment basins were proposed in Goat Canyon to help reduce sedimentation into the marsh; the Goat Canyon Sediment Basins were ultimately constructed in 2005.

From 2003 through 2008, documents generated for the 1991 TETRP EIR/EIS were reviewed and assessed for validity under current physical and biological conditions; additional studies of river hydrology and hydraulics were conducted for coastal processes, biology, cultural resources, and sediment characteristics; and refined alternatives for restoration were developed. One of the primary objectives of this effort was to reevaluate the TETRP as it was designed in the early 1990s and refine and update that plan in a feasibility study that would identify phases or modules that could be constructed as funding became available. The resulting Tijuana Estuary – Friendship Marsh Restoration Feasibility Study (Feasibility Study) (Tierra Environmental Services 2008) analyses focused on the physical and biological constraints of restoring tidal wetlands in the southern arm of the estuary. The resulting data review, new analyses, and constraints analyses were relied upon to refine TETRP II Phase I restoration design.

1.3 PURPOSE AND NEED AND PROJECT OBJECTIVES

1.3.1 NEPA Project Purpose and Need for the Action

The purpose of TETRP II Phase I is to restore habitats and functions of a portion of the southern arm of Tijuana Estuary to intertidal wetlands consistent with the recommendations presented in the Feasibility Study (Tierra Environmental Services 2008) and generally within the area recommended for restoration in the 1991 TETRP EIR/EIS. The larger restoration program would be completed in phases, of which the proposed project represents Phase I. Of the 250 acres originally identified for restoration in the Feasibility Study, Phase I would expand on the success of the 20-acre Model Marsh and restore approximately 82 to 87 additional acres of the estuary to tidal marsh and associated tidal channels, transitional, and upland habitats.

The need for the proposed action is to implement restoration within Tijuana Estuary that would address ongoing degradation of coastal resources that provide essential habitat for listed species, migratory birds, fish, and other aquatic resources. Restoration that increases the tidal prism would also improve water and habitat quality and expand tidal channel, mudflat, and salt marsh habitat needed to support healthy fish and wildlife populations. Additionally, removing sand from the

closed river mouth on an as-needed basis in order to keep the estuary open to tidal exchange would help support the estuarine ecosystem from water quality impacts that may result.

1.3.2 CEQA Project Objectives

Project objectives focus on increasing tidal prism and native wetland habitats, and include species-based restoration goals, as well as removing sand from the closed river mouth on an as-needed basis to maintain tidal exchange between the estuary and ocean. Additionally, establishment of coastal salt marsh habitats would benefit both aquatic organisms and terrestrial wildlife, and would help to restore the overall viability and health of the estuary complex. Given these broad guidelines, the CEQA objectives for the project were derived from the Feasibility Study and are summarized below:

- Increase tidal prism.
- Restore areas of former salt marsh, tidal channel, and mudflat affected by sedimentation.
- Remove sand as needed to maintain an open river mouth to support water quality and reduce potential hypoxic conditions.
- Restore barrier beach.
- Increase habitat for endangered species.
- Increase areas of undisturbed transition zone.
- Incorporate research and adaptive management into project design, implementation, and monitoring.

1.4 AGENCY DECISIONS AND REQUIRED PERMITS

Prior to project implementation, the following agencies may be required to determine their concurrence to issue the following decisions, approvals, and/or permits:

- California Coastal Commission (CCC) Coastal Development Permit/Federal Consistency Determination
  Section 30200 of the Coastal Act states "all public agencies carrying out or supporting activities outside the coastal zone that could have a direct impact on resources within the coastal zone shall consider the effect of such actions on coastal zone resources in order to assure that these policies are achieved." This standard of review is followed for all projects including federal activities that may affect coastal zone resources or uses. Chapter 3 policies of the Coastal Act include, but are not limited to, protection of public access to and along the shoreline; protection of public and lower-cost recreational opportunities; minimizing risk to life and property; protection, enhancement, and restoration of environmentally sensitive habitats; protection of surface water and groundwater resources; and protection of scenic vistas, coastal landscapes, and sensitive visual resource.

- U.S. Army Corps of Engineers Clean Water Act (CWA) Section 404 Nationwide Permit 27 (and others if appropriate)
  CWA Section 404 establishes a program to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands, and requires a permit before dredged or fill material may be discharged into waters of the U.S. The basic premise is that no discharge of dredged or fill material may be permitted if (1) a practicable alternative exists that is less damaging to the aquatic environment, or (2) the nation's waters would be significantly degraded. Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts, but for most discharges that will have only minimal adverse effects, a general permit is issued by the Corps on a nationwide, regional, or state basis for particular categories of activities.

  Under the Water Resources Development Act of 1986, the Corps is also authorized to permit the placement of dredged material on the beach or in the ocean for beneficial use purposes through the Section 404 process. The Corps also has the discretion to determine if testing of material excavated from a project site that is proposed for ocean disposal, including disposal on the beach or in the swash zone, is warranted pursuant to the 404(b)(1) guidelines (40 CFR 230.10 and 230.11). The current regulations provide for testing under certain circumstances and provide flexibility to the permitting authority to decide, based upon the facts of a particular case, whether testing is warranted. Sediment Testing Plans and sediment testing results are reviewed and commented upon by members of the Southern California Dredged Material Management Team, an interagency team that oversees dredged material testing and suitability determinations, including for beneficial use placement, within Southern California. The Corps is the agency responsible for issuing permits for dredging and disposal. While there may be a suitability determination discussed by an interagency review group, each agency retains independent authority for final decisions and issuance of relevant permits or certifications.

- San Diego Regional Water Quality Control Board (RWQCB) CWA Section 401 Water Quality Certification
  CWA Section 401 water quality certifications are issued to applicants for activities that may result in a discharge into waters of the U.S., including but not limited to the discharge or dredged or fill material. The type of CWA Section 401 Water Quality Certification depends on the project activity, location, and federal permit being sought. Coordination with the Corps is required as part of this process.

- USFWS Refuge Special Use Permit (SUP)
  The USFWS may determine that an SUP should be issued to CSP associated with the TETRP II Phase I project to allow restoration activities to be conducted on the Tijuana Slough NWR. This SUP requirement is meant to ensure that all activities on a refuge are compatible with the refuge's Congressionally mandated purposes and wildlife conservation goals.

- Consultation with USFWS and National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service pursuant to Section 7 of the Federal Endangered Species Act (FESA) and the Marine Mammal Protection Act (MMPA)
  Federal agencies are required to consult with NOAA on activities that may affect marine mammals and endangered and threatened marine species or their habitats, as required under the MMPA and Section 7 of the FESA. These interagency consultations are designed to help the agencies ensure that federal projects or activities do not jeopardize the continued existence of a species or adversely impact important fish habitat or designated critical habitat.

- Consultation with NOAA pursuant to the Magnuson-Stevens Act (Essential Fish Habitat)
  With some exceptions, the MMPA prohibits the "take" of marine mammals in U.S. waters. A consultation with NOAA is required whenever a federal agency works in an area that will adversely affect essential fish habitat. Together, the agency and NOAA determine how best to conduct coastal development while supporting fish habitat and minimizing or avoiding environmental damage.

- Consultation with the California Department of Fish and Wildlife (CDFW) pursuant to Section 2081 of the California Endangered Species Act (CESA)
  Section 2081 subdivision (b) of the Fish and Game Code allows CDFW to authorize take of species listed as endangered, threatened, candidate, or a rare plant, if that take is incidental to otherwise lawful activities and if certain conditions are met.

- Notification to California State Lands Commission
  A portion of the Tijuana Slough NWR includes land leased to the USFWS by the California State Lands Commission for use and maintenance of an NWR. If activities associated with the proposed restoration project could affect the leased portions of the Refuge, the State Lands Commission will be notified.

- USFWS consultation with the State Historic Preservation Officer (SHPO)/Tribal Historic Preservation Officer (THPO) and other consulting parties, as applicable, under Section 106 of the National Historic Preservation Act of 1966 (NHPA)
  Section 106 of the NHPA requires federal agencies to consider the effects of proposed federal undertakings on historic properties, and NHPA's implementing regulations found in 36 CFR § 800, require federal agencies to initiate consultation with the SHPO as part of the Section 106 review process. THPOs have assumed the historic preservation officer functions for Tribal lands; however, they may not have been designated by their Tribal governments to function as the sole point of contact for the review of undertakings on and off Tribal lands. Therefore, federal agencies should contact both the Tribal governmental leaders and the THPO prior to formal initiation of Section 106 consultation in order to determine the appropriate point(s) of contact.

- Consultation between California Native American Tribal governments and lead agencies pursuant to California Assembly Bill 52 (AB 52)
  AB 52 requires a CEQA lead agency to provide formal notification to designated contact or Tribal representatives of proposed projects in the geographic area with which the Tribe is traditionally and culturally affiliated. Under AB 52, a Tribal cultural resource is identified as a site, feature, place, cultural landscape, sacred place or object, which is of cultural value to a Tribe; and is either on or eligible for the California Register of Historic Resources or a local historic register; or the lead agency, at its discretion chooses to treat the resource as a Tribal cultural resource (PRC Section 21074).

1.5 PUBLIC INVOLVEMENT AND ENVIRONMENTAL REVIEW PROCESS

1.5.1 Notice of Preparation/Notice of Intent and Public Scoping

A Notice of Preparation (NOP) consistent with CEQA and a Notice of Intent (NOI) consistent with NEPA were distributed on May 27, 2021, to public agencies, Tribal governments, interested organizations, and members of the general public to provide formal notification that an EIR/EIS would be prepared. The NOP/NOI was also sent to the State at the California Office of Planning and Research (OPR) Clearinghouse and published in the Federal Register (86 FR 28638) on May 27, 2021. During the 45-day public scoping period, which is designed to help determine the range of issues addressed in the DEIR/EIS, two virtual public scoping meetings were held on June 16, 2021. Approximately 15 people attended each of the meetings, where general verbal and specific written comments were accepted. In addition, public notices announcing the scoping process were distributed to more than 300 entities, including local, state, and federal agencies, Tribal governments, and the public. In total, 15 comments were received in response to the scoping process and are provided for review in Appendix B. Additionally, in accordance with 40 CFR § 1502.17(a), Table 1-1 provides a summary of the alternatives, information, and analyses provided during the scoping process for the TETRP II Phase I project. This information was considered by the lead and cooperating agencies in developing the joint DEIR/EIS.

Table 1-1
Summary of Public Scoping Comments

Public Comments by Environmental Topic or Issue Area	Section Where Addressed in DEIR/EIS
Air Quality/Greenhouse Gas Emissions/Sea Level Rise	
Discuss ambient air conditions, National Ambient Air Quality Standards (NAAQS) and nonattainment areas, and potential air quality impacts.	4.13
Identify possible disposal areas and assumptions for estimating emissions.	3.3.2, 4.13
Identify probable routes for construction traffic.	3.3.2
Recommend measures to mitigate construction emissions of nitrogen (NOx) and volatile organic compounds (VOCs).	4.13

Public Comments by Environmental Topic or Issue Area	Section Where Addressed in DEIR/EIS
Use energy efficient lighting systems, locate staging areas away from residential areas/sensitive receptors, and avoid routing traffic near sensitive land uses.	3.3.2, 3.3.4
Address the applicability of Clean Air Act Section 176 and EPA's general conformity regulations at 40 CFR §§ 51 and 93.	4.13
Consider the effects of potential future sea level rise on habitat modifications, including a range of future sea level rise conditions.	3.3.2
Hydrology and Water Quality	
Differentiate potential water quality effects between alternatives as much as possible.	4.3
Evaluate changes in drainage patterns, runoff, and sedimentation.	4.3
Sample sediments and water quality within the beach placement footprint pre-construction.	4.3, 4.4
Project Description and Design	
Discuss project purpose and project description, including staging areas/access routes.	1.3, 3.3
Include a range of feasible alternatives.	3.3
Include a discussion of adaptive management and monitoring.	Appendix C, Section 7.2
Biological Resources & Permitting	
Restoration of the mouth of the Tijuana River should consider fish passage for anadromous fishes and other issues such as sedimentation and turbidity.	4.6
Avoid occupied habitat by California fully protected species to the extent practicable.	4.6
Include consultation with regulatory and resource agencies, including the USFWS, CDFW, and Corps.	4.6
Analyze direct and indirect impacts to biological resources and the MHPA.	4.6
Assess the potential for flora and fauna, including narrow endemic species, on the site.	4.6
Include mitigation measures for impacts to aquatic resources, sensitive habitats, and sensitive species in sufficient detail to satisfy permit requirements.	4.6
Evaluate direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts.	4.6
Avoidance and minimization measures should be incorporated into a MPA Impact Avoidance, Minimization and Monitoring Plan for the proposed sediment placement work within or adjacent to the Tijuana River Mouth SMCA and the Tijuana River Inlet.	3.3.2, 4.6
Include discussion of how the proposed project would keep the area from being filled by sediment in the future.	3.3.1, 4.6
Recreation and Public Access	
Evaluates potential impacts on the TRVRP and its associated recreational activities.	5.4
Coordinate with County DPR.	5.4
Hazardous Materials and Public Safety	
Address and minimize potential impacts from possible mosquito breeding sources created by the proposed project.	4.5
Evaluate and verify sediment characteristics, including DDT.	4.5
Prepare and submit a Conditional Letter of Map Revision/Letter of Map Revision (CLOMR/LOMR) application to FEMA.	1.4
Cultural/Tribal Cultural Resources	
Coordinate with City staff to ensure resources are adequately evaluated, preserved, protected, and/or mitigated.	4.8
Conduct early consultation with California Native American Tribes traditionally and culturally affiliated with the geographic area.	4.9
Land Use	
Discuss compliance with the overall goals and objectives of the Tijuana River Valley Plan and Local Coastal Program.	2.4, 4.1
Analyze the project against Section 1.4.1, Compatible Land Uses of the MSCP Subarea Plan.	2.4

Public Comments by Environmental Topic or Issue Area	Section Where Addressed in DEIR/EIS
Permitting	
Identify possible discretionary actions or permits within City land use authority.	1.4
Other	
Include a cumulative effects analysis as described under CEQA Guidelines, Section 15130.	5.4
Include the Agreement with the United States-Mexico-Canada (USMCA Mitigation of Contaminated Transboundary Flows Project 2021).	5.4
Include discussion of what will happen if no action is taken.	3.3.3; throughout analysis sections included in Chapter 4
Review the importance of this work with communities near the estuary such as Tijuana, Imperial Beach, San Diego, and Coronado.	4.16; throughout analysis sections included in Chapter 4
Evaluate if either alternative will protect the cities to the east.	Throughout analysis sections included in Chapter 4
Include reasonably foreseeable environmental trends and planned actions in the area.	5.4
Evaluate impacts within the unincorporated county or county facilities using the County's Guidelines for Determining Significance.	5.4

1.5.2 Notice of Availability of the Draft EIR/EIS

A Notice of Availability (NOA) of the TETRP II Phase I DEIR/EIS was published in the Federal Register (87 FR 51124) on August 19, 2022, and two virtual public meetings were held on September 8, 2022. The public meetings included a presentation regarding the proposed project and an overview of the analysis provided in the DEIR/EIS. The purpose of the meetings was to provide the public with an opportunity to ask questions regarding the project and the project alternatives.

The 45-day public comment period for the DEIR/EIS ended on October 3, 2022, during which time six comment letters were received. Chapter 8 includes a summary of the submitted comments, alternatives, information, and analyses provided during the comment period. CSP and the USFWS have prepared written responses to all comments received during this period. The individual letters and responses to the comments are included in the FEIR/EIS as Appendix D.

The FEIR/EIS and associated Appendices are available for review on the following websites:

https://www.parks.ca.gov/?page_id=983
Once at the site, scroll down to San Diego.

https://trnerr.org/about/public-notices/
Once at this site, scroll down to the section entitled Tijuana Estuary Tidal Restoration Program (TETRP) II Phase I.

The NOA of the Final EIS has been published in the Federal Register. A decision on the selection of the alternative to be implemented will be provided in a Record of Decision, which will be issued no sooner than 30 days after the publication date for the Notice of Availability of the FEIS. Copies of the FEIR/EIS have been made available for on-site review at the following locations (please check with individual locations regarding hours and document availability prior to arrival):

Tijuana Estuary Visitor Center
301 Caspian Way
Imperial Beach, CA 91932
Closed Mondays and Tuesdays
Phone (619) 575-3613

California Department of Parks and Recreation
San Diego Coast District Office
4477 Pacific Highway
San Diego, CA 92110
Phone (619) 688-3260

Imperial Beach Branch Library
810 Imperial Beach Blvd.
Imperial Beach, CA 91932
Closed Sundays
Phone (619) 424-6981

Additional project information will be posted and updated at https://trnerr.org/about/public-notices/. Once at this site, scroll down to the section entitled Tijuana Estuary Tidal Restoration Program (TETRP) II Phase I.

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CHAPTER 2.0
PROJECT OVERVIEW

2.1 PROJECT LOCATION

The proposed project would be located in the southern arm of Tijuana Estuary in San Diego County, California, within the Tijuana River National Estuarine Research Reserve (TRNERR or Reserve), as shown in Figure 2-1. TRNERR is composed of federal, state, and local lands within the jurisdiction of the cities of San Diego and Imperial Beach. The boundaries of the proposed project encompass portions of both Border Field State Park and the Refuge, managed by CSP and the USFWS, respectively. Project boundaries, construction staging, and access areas are shown in Figure 2-2.

2.2 ENVIRONMENTAL SETTING

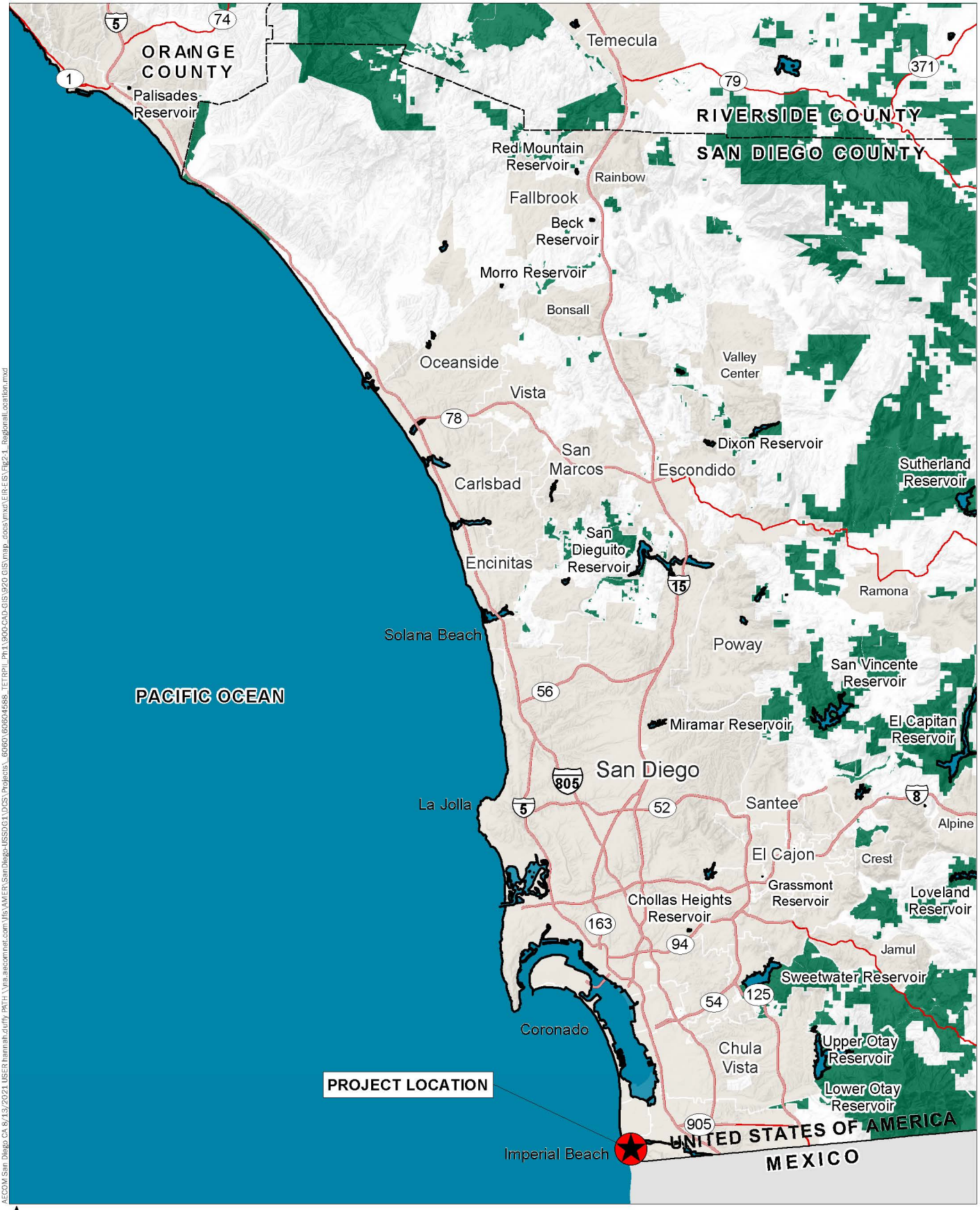
2.2.1 General Character of the Site

Tijuana Estuary is located at the southwest corner of the United States in San Diego County. The Tijuana River drains an approximately 1,700-square-mile watershed, 73% of which is located within Mexico (ENTRIX *et al.* 1991). The northern arm of the estuary has been less impacted by erosion and associated land uses than the southern arm (Tierra Environmental Services 2008). The estuary is bordered to the west by the Pacific Ocean and to the north, east, and south by unincorporated county lands and lands within the cities of Imperial Beach and San Diego, and Tijuana, Mexico. The Tijuana River Valley, which consists of developed and undeveloped lands, including commercial, residential, recreational, and agricultural uses, open space and park land, extends east of the estuary.

Despite a variety of impacts to the system, Tijuana Estuary remains the largest, most intact coastal wetland in the region. It is located near the southwestern end of San Diego County and extends to the Mexico border. The TRNERR Visitor Center is located at the northern end of the estuary. Border Field State Park, along with the Refuge, supports a series of trail networks in upland areas around the estuary for recreational uses, as shown in Figure 2-3. At the southernmost portion of the estuary, Border Field State Park provides restrooms, picnic areas, barbecues, horse corrals, and interpretive displays.

Historically, agriculture and military activities occurred within Tijuana Estuary, especially in the southern arm which was heavily impacted by filling and diking for these activities (Tierra

Exhibit 3: Tijuana Estuary Tidal Restoration Program II Phase 1 Final EIR/EIS



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AECOM
San Diego County, California
TETRP II Phase I EIR/EIS

FIGURE 2-1 - REGIONAL LOCATION

Exhibit 3: Tijuana Estuary Tidal Restoration Program II Phase 1 Final EIR/EIS

N 0 2,000 4,000 Feet

Note: The Tijuana River mouth location is not fixed. Impacts were calculated based on the inlet position when the hydraulic modeling was conducted and may shift again before the project is constructed.

Source: GoogleEarth 2021

AECOM
San Diego County, California
TETRP II Phase I EIR/EIS

FIGURE 2-2 - PROJECT LOCATION

60604588\Figure 2-2 Project Location.ai dbrady 05/17/2022

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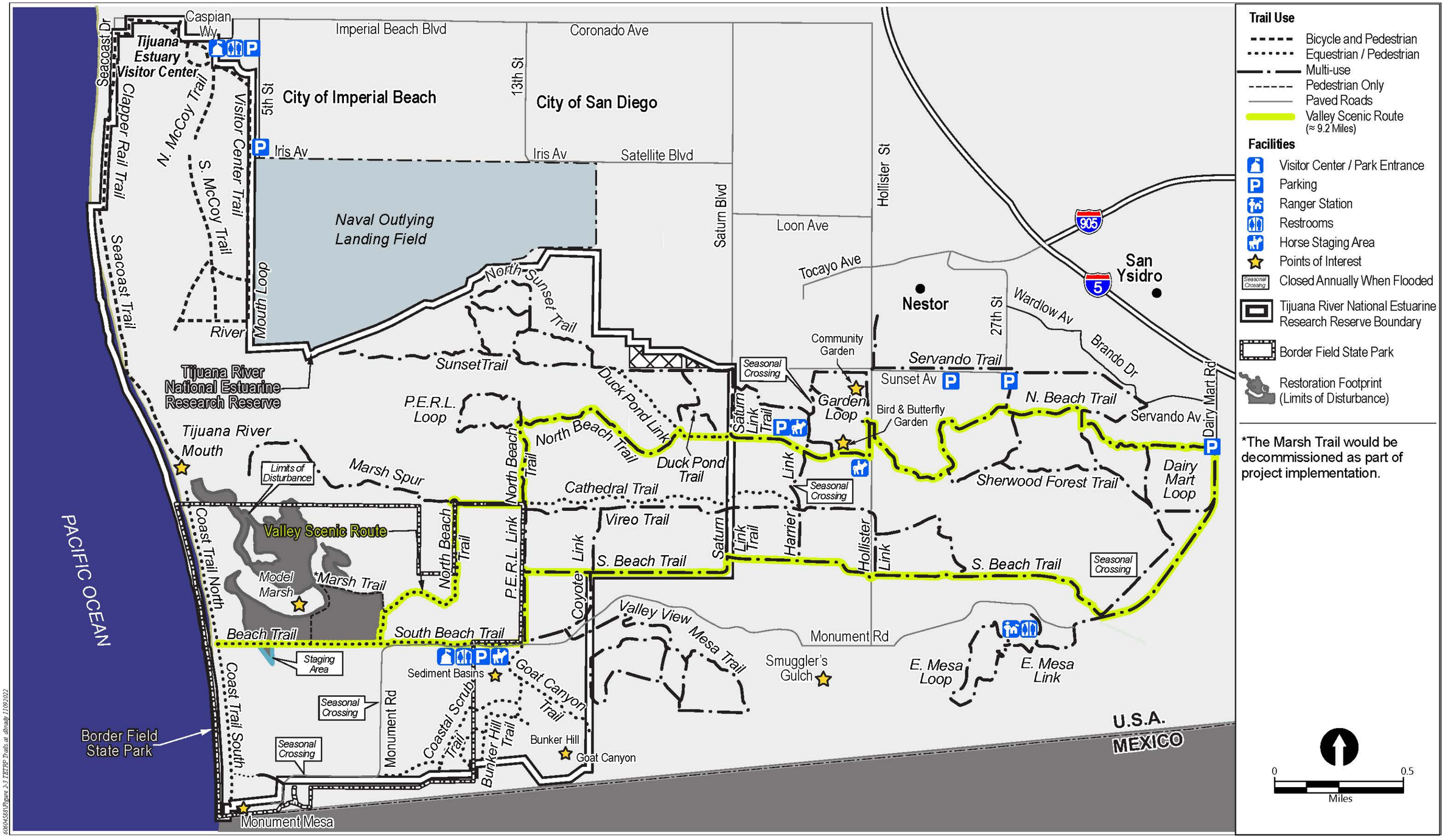

Data Source: SANDAG, US Fish & Wildlife Service, County of San Diego department of Parks and Recreation, TRNERR, Quantum Spatial, AECOM

AECOM
San Diego County, California
TETRP II Phase I EIR/EIS

FIGURE 2-3
TIJUANA RIVER NATIONAL ESTUARINE RESEARCH RESERVE TRAILS

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Environmental Services 2008). Military use of the lands north of TRNERR continues at Naval Outlying Landing Field Imperial Beach (NOLF IB), which operates under the command of Naval Base Coronado. No agricultural operations are present in the immediate vicinity of the project site.

2.2.2 Land Ownership

TRNERR, comprising approximately 2,293 acres, has a variety of local, state, and federal agency landowners (TRNERR 2010). The major landowners and associated acreages are provided in Table 2-1 and illustrated in Figure 2-4.

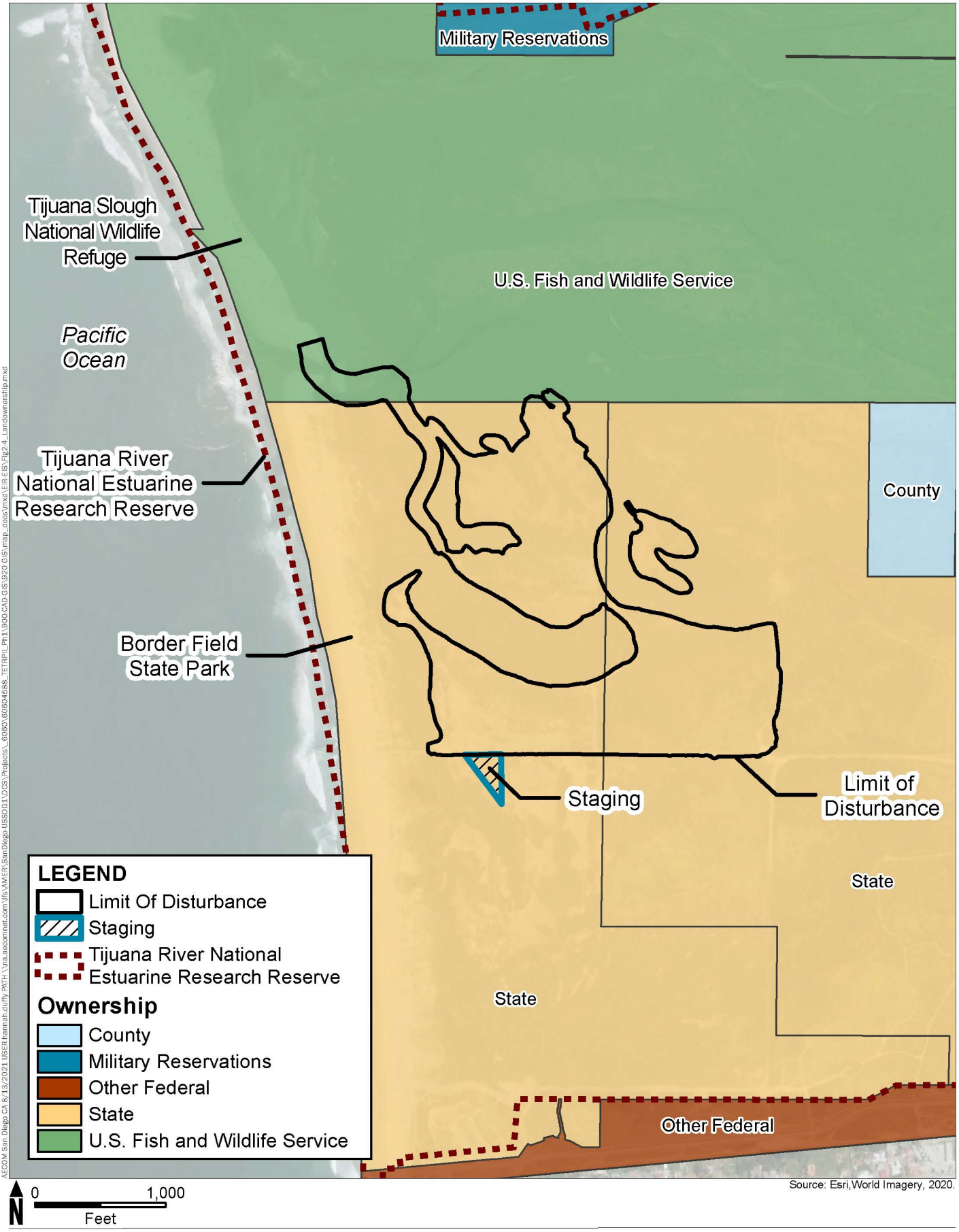
Table 2-1
Major Land Owners – Tijuana River National Estuarine Research Reserve

Park/Preserve	Landowner	Acres
Border Field State Park	California State Parks	761 acres
Tijuana Slough National Wildlife Refuge (1,023 acres)	U.S. Fish and Wildlife Service	407 acres (Fee title)
Tijuana Slough NWR	U.S. Navy under Memorandum of Understanding	551 acres (Refuge Overlay)
Tijuana Slough NWR	State of CA, State Lands Commission Lease	65 acres (Waters of the State)
Various Properties	County or City of San Diego ownership or jurisdiction	509 acres
Total	**-**	**2,293 acres**

The 124.5-acre TETRP II Phase I project site includes lands owned by the State of California and the USFWS. The majority of the project site, approximately 117.2 acres, including the majority of the restoration and enhancement areas (94.3 acres) as well as the potential beach nourishment area (22.9 acres), is owned by the State of California and included within Border Field State Park. Approximately 5.3 acres of the restoration project would be located within the boundaries of the Refuge. An additional 2 acres are tidelands proposed for beach nourishment and are sovereign lands under the jurisdiction of the State Lands Commission.

2.2.3 Surrounding Development

Dense housing and retail complexes in the City of Imperial Beach border the estuary to the north along with NOLF IB, an active airfield that provides training for the Pacific Fleet helicopter squadrons (SANDAG 2018). No access to the airfield is provided from the project site. Interstate 5 (I-5) and Interstate 805 (I-805), located to the east, provide north-south access to the project site, while Dairy Mart Road and Monument Road provide the major east-west access routes to the project site and the southern portion of the estuary, including Friendship Park at the international border. Two water



Source: Esri,World Imagery, 2020.

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FIGURE 2-4 - LAND OWNERSHIP

treatment plants are located east of the project site: the City of San Diego's South Bay Wastewater Reclamation Plant, and the U.S. International Boundary and Water Commission's (USIBWC) South Bay International Wastewater Treatment Plant. U.S. Department of Homeland Security (DHS) Imperial Beach Station is located just east of NOLF IB and DHS owns and manages a system of roads and infrastructure on the international border; no access to these facilities is provided from the project site. Increasing development has been occurring to the south of TRNERR in Tijuana, Mexico, over the past 20–30 years. This dense development to the south of the estuary has resulted in destabilization of the highly erodible soils and increased sedimentation issues within TRNERR (Tierra Environmental Services 2008).

2.2.4 Rare and Unique Environmental Resources

Coastal estuaries in San Diego provide critical functions in support of wildlife and plant species. These unique systems have undergone substantial transformations over the past centuries due to human development and influence. As coastal wetlands decline throughout California, the biological importance and uniqueness of Tijuana Estuary becomes more apparent. Despite disturbances in the recent past, including an increased volume of freshwater inputs; sedimentation; and impacts from Border Patrol, military, and agricultural uses, Tijuana Estuary provides habitat for sensitive, threatened, and endangered plants and animals, including resident and migratory wildlife (Tierra Environmental Services 2008). More than 374 bird species have been documented in the Tijuana River Valley, which can be attributed to the availability of a variety of habitats, including intertidal mudflats, coastal salt marsh, brackish marsh, coastal scrub, dunes, riparian habitats, and regionally rare native transitional habitat (Tierra Environmental Services 2008). Coastal salt marsh vegetation is very important for several rare and endangered species of birds, including the federal and state endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*) and state endangered Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*), which are dependent on this habitat for survival. The estuary is also an important stop along the Pacific Flyway providing foraging and resting areas for migratory birds traveling between breeding sites in Arctic and sub-Arctic regions and southern wintering sites (Tierra Environmental Services 2008). Tijuana Estuary provides a number of additional ecological benefits, including nursery and refugia for fish species, erosion protection for shorelines, and littoral sand delivery to the coast (Zedler 1996). These critical wetland functions have remained relatively intact in the northern arm of the estuary while the southern arm's ability to support this diversity has decreased as a result of human development and influence.

2.3 CURRENT USES IN AND SURROUNDING THE PROPOSED PROJECT SITE

The area in and around Tijuana Estuary provides recreational opportunities frequently used by the public. Land managers are therefore required to balance the recreational needs and desires of the public with the need to protect the area's natural habitats and sensitive species these habitats

support. In 1991, the Tijuana Estuary Visitor Center was constructed in the northern portion of the estuary with a USFWS easement provided to CSP (TRNERR 2010). The visitor center has provided a centralized location where the public can gather information, participate in educational opportunities, and partake in general involvement with the Reserve (TRNERR 2010). Trails at the northern arm of the estuary are designated for pedestrian or pedestrian and bike-friendly uses, as shown in Figure 2-3. Viewing areas, picnic areas, and interpretive displays are accessible to the public within the Refuge.

Within the southern portion of the estuary, Border Field State Park provides a trail system designated for pedestrian or pedestrian and equestrian uses. Amenities including a corral and hitching posts are provided for equestrian users. Existing trails that border the southern boundary of the proposed restoration area provide access to the beach and dunes (Beach and South Beach Trails). Marsh Trail is within the project site and a portion of Marsh Trail borders the proposed marsh restoration area to the east. The County of San Diego, Department of Parks and Recreation recently opened a new multi-use campground, outdoor nature education center, and day-use facilities in the spring of 2021. This new facility is located east of the project site within the Tijuana River Valley Regional Park (Coastal Conservancy 2019). Public access to the area designated for habitat restoration as part of the proposed project is not permitted except on official trails as shown in Figure 2-3. North–to-south beach access is maintained north and south of the river mouth to the international border. DHS maintains a presence near the international border through ownership and management of roads and infrastructure near the international border, with U.S. Customs and Border Protection (CBP) actively patrolling the area. Also of note, the area offshore of Tijuana Estuary was designated as a State Marine Conservation Area (SMCA) under the Marine Life Protection Act (MLPA) in 2012.

2.4 PLANNING INFLUENCES

Multiple planning networks and documents apply to the project area or portions thereof. Applicable federal, state, and local planning efforts for the proposed project are summarized below.

Tijuana River National Estuarine Research Reserve, Tijuana Slough National Wildlife Refuge, and Border Field State Park

Tijuana Estuary was designated as TRNERR by NOAA in 1982 under Section 315 of the Coastal Zone Management Act (CZMA) of 1972. TRNERR now includes both the Refuge and Border Field State Park. National Estuarine Research Reserves (NERR) are estuarine areas protected and managed through a federal-state cooperative effort for long-term research, education, and stewardship. CSP is NOAA's partner in this federal-state cooperative effort at TRNERR, with the SWIA as an additional, NOAA-funded partner (NOAA 2017).

The Refuge was established in 1980 under the authority of the FESA. NWRs are guided by the mission and goals of the National Wildlife Refuge System (NWRS) and the designated purposes for which each refuge was established. The mission of the NWRS is "to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." The Refuge forms the northern half of TRNERR and is managed by the USFWS as a unit of the NWRS. The Refuge consists of land owned by both the USFWS and the U.S. Navy. Under a 1992 Memorandum of Understanding, the USFWS manages the U.S. Navy property for Wildlife Refuge purposes (CONCUR 2000). The USFWS administers the Refuge, including both the lands of the USFWS and U.S. Navy, and adjacent state tidelands under a lease from the California State Lands Commission.

CSP owns and administers the 761-acre Border Field State Park located at the southern end of TRNERR. Under the jurisdiction of CSP, general land use policies for Border Field State Park are dictated by the Border Field State Park General Development Plan (CSP 1987) and by the unit's classification as a "State Park." California Public Resources Code (PRC) 5019.53 states: *"State parks consist of relatively spacious areas of outstanding scenic or natural character, oftentimes also containing significant historical, archaeological, ecological, geological, or other such values. The purpose of state parks shall be to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora…. Each state park shall be managed as a composite whole in order to restore, protect, and maintain its native environmental complexes to the extent compatible with the primary purpose for which the park was established.* The CSP Manager of Border Field State Park also serves as Reserve Manager and is responsible for administering NOAA funding and programs at TRNERR. A sub-unit designation of 327 acres within the total area of Border Field State Park is designated as the Tijuana Estuary Natural Preserve. As defined by California PRC 5019.71, part of the purpose of such land designations is "*to preserve such features as rare or endangered plant and animal species and their supporting ecosystems, representative examples of plant or animal communities existing in California prior to the impact of civilization, geological features illustrative of geological processes, significant fossil occurrences or geological features of cultural or economic interest, or topographic features illustrative of representative or unique biogeographical patterns*."

TRNERR Comprehensive Management Plan

In 2000, a Comprehensive Management Plan (CMP) was approved by NOAA and the USFWS, serving as a collaborative management plan between the NERR and NWRS. The 2000 CMP was developed using a consensus-based planning process including the TRNERR Advisory Council, staff members of the operating agencies (CSP and USFWS), and community members (TRNERR

2010), and will continue to serve as the primary planning tool for the Refuge until an updated management plan, a Comprehensive Conservation Plan, is prepared and approved for the Refuge.

The CMP for TRNERR was updated in 2010 to continue to guide TRNERR in its mission to protect estuarine resources. This plan outlines key guiding principles for operations in the TRNERR, including the administrative framework; resource protection, management, and restoration; research and monitoring program; and education and interpretation opportunities within the TRNERR.

California Coastal Act/Coastal Zone

The TETRP II Phase I project site is within the coastal zone as designated by the CCC, with the state lands subject to the California Coastal Act of 1976 and the federal land subject to the CZMA, as amended. Actions proposed within state lands located in the coastal zone must be found to be consistent with Chapter 3 of the Coastal Act. The western portion of the project site, including beach nourishment areas, is within the City of Imperial Beach's Local Coastal Plan (LCP) jurisdiction; however, the project site remains within the CCC's retained jurisdiction for Coastal Development Permit (CDP) issuance (Ross and Leach, personal communication, 2021). On the eastern portion of the project site within the City of San Diego, CCC jurisdiction is identified as a deferred certification area in the Tijuana River Valley LCP, meaning the CCC maintains jurisdiction over this area (City of San Diego 1999; Ross and Leach, personal communication, 2021).

City of San Diego Multiple Species Conservation Program Subarea Plan and Multi-Habitat Planning Area

The Multi-Habitat Planning Area (MHPA) is a regional habitat preserve system designated as part of the City of San Diego's Multiple Species Conservation Program (MSCP). Aside from the western corridor of the estuary within the City of Imperial Beach that includes the beach, along with the lands within the boundaries of the Refuge, the estuary east of the Imperial Beach boundary is entirely within the MHPA. The City's MHPA and MSCP requirements and guidelines are applicable to City-owned land, but do not apply to state or federally owned lands. In general, MHPA requirements are considered by CSP and applied as appropriate within Border Field State Park, but are not planning requirements. Since this land designation is not applicable to the project site, it is not further analyzed in the document and is instead provided for overall regional planning influences within TRNERR.

Tijuana River Mouth State Marine Conservation Area

The Tijuana River mouth is located at the terminus of the Tijuana River with the Pacific Ocean and is designated by CDFW as a State Marine Conservation Area (SMCA) under the MLPA. The Tijuana River Mouth SMCA includes approximately 3 square miles, including 2.3 miles of shoreline, and is bounded by the mean high tide line, and extends from approximately the southern end of Seacoast Drive south to the international border (CDFW 2016, 14 CCR § 632(b)(147)(A)). In an SMCA, it is unlawful to injure, damage, take, or possess any living, geological, or cultural marine resource for commercial or recreational purposes, or a combination of commercial and recreational purposes, that the designating entity or managing agency determines would compromise protection of the species of interest, natural community, habitat, or geological features (PRC Section 36710(c)). Within the Tijuana River Mouth SMCA, commercial and recreational fishing are allowed for coastal pelagic species, except market squid with specifications on methods and percent weight of catch (14 CCR § 632(b)(147)(B)). Beach nourishment and sediment management activities are permitted within the conservation area as approved by required regulatory agency permits, or as otherwise authorized by CSP (14 CCR § 632(b)(147)(C)).

National Natural Landmark and Ramsar Site

The importance of the biological resources present within the Tijuana Estuary was recognized by the Secretary of the Interior in 1973 when a 1,569-acre portion of the Tijuana Estuary was designated a National Natural Landmark. The landmark is referred to as the Tijuana River Estuary. Additionally, in 2005, TRNERR was designated a Ramsar site, establishing it as a wetland site of international importance under the Ramsar Convention.

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CHAPTER 3.0
ALTERNATIVES

3.1 CEQA AND NEPA ALTERNATIVE ANALYSIS REQUIREMENTS

NEPA and CEQA require the objective evaluation of a "reasonable" range of alternatives. Under NEPA, reasonable alternatives means a reasonable range of alternatives that are technically and economically feasible and meet the purpose and need for the proposed action (40 CFR § 1508.1(z). Section 15126.6 of the CEQA Guidelines requires that an EIR "describe a range of reasonable 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." Factors used to determine feasibility include site suitability, economic limitations, availability of infrastructure, consistency with local plans and policies, other plan or regulatory limitations, and jurisdictional boundaries.

3.2 ALTERNATIVES DEVELOPMENT PROCESS

As discussed in Section 1.2, Tijuana Estuary has a long history of research and restoration planning and implementation. TETRP was initiated in 1988 and documented in the 1991 TETRP EIR/EIS. Portions of the project as originally proposed were implemented (i.e., Model Marsh), while others have been refined over time and/or identified for implementation in phases. TETRP II Phase I was developed following the initial TETRP and is the first phase of a multi-phase restoration of the southern arm of Tijuana Estuary. It builds upon the conceptual restoration plan developed for the Feasibility Study (Tierra Environmental Services 2008), which proposed multi-phase restoration of approximately 250 acres of the estuary.

Various restoration options for the southern arm of the estuary have been rigorously explored through numerous studies and taken into consideration during development of the proposed alternatives. The goal and objectives for TETRP II Phase I include restoring approximately 82 to 87 acres of salt marsh, mudflat, tidal channel, transitional, and upland habitats that have been degraded over the past several decades and increasing the tidal prism of the estuary.

Based on the results of the data review, new analyses, and a constraints assessment included in the Feasibility Study, refined TETRP II Phase I restoration designs for the southern arm of the estuary were developed. These new analyses included an in-depth consideration of potential climate change impacts for the estuary and its restoration, as informed by the Climate Understanding and Resilience in the River Valley (CURRV) project (TRNERR 2014; 2016). These climate-related studies included consideration of long-term change in the Tijuana River Valley, interpretation of sea level rise modeling results, expert elicitation, and scenario planning under varying sea level

rise scenarios (Safran *et al.* 2017; Gersberg 2009; Thorne *et al.* 2016; Goodrich *et al.* 2018). The CURRV process indicated that there are broad areas of transitional habitat within the Tijuana River Valley that eventually could convert to tidal wetland with sea level rise. Additionally, elevation increases due to sedimentation within the estuary have been so extensive in critical locations, including within the project site, that it would take decades to recover lost habitats. More fundamentally, empirical evidence from observations during El Niño conditions and scenario planning exercises suggest that elevated sea levels coupled with changing wave climates can increase the frequency and/or duration of mouth closure events, thus decreasing the resilience of the system and dramatically compromising ecosystem integrity and health (Harvey *et al.* 2020).

Given this understanding of the system and consideration of constraints and opportunities, TETRP II Phase I was designed to increase tidal prism, based on its role in maintaining river mouth conditions, and to restore tidally influenced habitat for the benefit of fish and wildlife, including listed and sensitive species. The proposed project is being considered in the context of TRNERR's larger adaptive restoration program, an iterative process where lessons learned in each implementation phase are applied to the next implementation phase (ENTRIX *et al.* 1991; Nordby 2018). In particular, the proposed project design incorporates the physical constraints posed by the Tijuana River and its tributaries, and the goals and objectives of the restoration as determined by the project design team and TRNERR. Approaches for long-term maintenance and adaptive management strategies would be reviewed by the TETRP Science Advisory Team (SAT). The TETRP SAT has been involved with planning and iterative design phasing since refinement of TETRP II Phase I began, and will likely provide input as design and permitting are finalized. These efforts will be informed by continuing research, monitoring, and modeling within TRNERR.

A brief summary of the concepts and alternatives that have been considered throughout the planning and study efforts (i.e., 1991 EIR/EIS, Feasibility Study, and TETRP II Phase I initial studies) is included below. Tables 3-1, 3-2, and 3-3 indicate whether those components or alternatives were eliminated from consideration or if they have been carried forward for analysis as part of the proposed project or project alternatives.

- Program EIR/EIS (1991) for TETRP:
  - Establish approximately 495 acres of estuarine habitat and restore tidal prism to 1852 volume
  - Construct training levees (berms) along the river to protect wetlands from sedimentation
  - Reestablish dune vegetation on the barrier beach
  - Restore riparian habitats associated with the Tijuana River
- Feasibility Study (2008) for TETRP II
  - Study area of approximately 250 acres
  - Provide a river berm to protect wetlands from sediment carried by the Tijuana River
  - Establish transitional areas to protect wetlands from sediment flows moving downstream through Goat Canyon

Table 3-1
History of Potential Components and Alternatives Considered for the Program EIR/EIS for TETRP

Alternatives Evaluated	Alternatives Description	Components/Alternative Carried Forward or Eliminated
TETRP Preferred Alternative	• Consisted of components to increase salt marsh and restore tidal flushing to areas silted over in previous decades o Model Marsh Project – 20 acres of marsh; o Oneonta Slough Widening; o construction of Connector Channel to northern arm; o 495-Acre Restoration Project including river training berm	**Constructed** • Model Marsh project carried forward and constructed • Connector Channel (also referred to as Oneonta Tidal Linkage) carried forward and constructed **Eliminated due to:** • Oneonta Slough Widening not constructed due to impacts to sensitive salt marsh from the equipment that would have been required to excavate and haul 26,000 cubic yards of material (Nordby 2018) **Carried Forward** • 495-acre Restoration Project carried forward but deferred to future phases
Restoration of Wetlands in Central Estuary (Enhancement Alternative Considered)	• Restore 300 acres in central estuary, requires 4 million cubic yards (mcy) of excavation • Include river training berm (8,000 feet)	**Eliminated due to:** • Restored area would be limited in size • River training berm would deflect flows to the southern arm and increase sedimentation in wetlands • River training berm would be long and susceptible to failure • Would have impacted areas that represent opportunities for riparian restoration • Would require purchase of private land outside of Reserve
Restoration of 250 acres in Southern Arm (Enhancement Alternative Considered)	• Restore 250 acres of intertidal and high salt marsh in southern arm, required 2 mcy of excavation	**Eliminated due to:** • Extensive impacts to existing sensitive resources, which posed substantial barriers to obtaining required permits/approvals • Cost associated with removal of large amounts of soil (i.e., 2 mcy) • Change in site characteristics, such as sediment deposition, and management capabilities and conditions in the southern arm
Restoration of 500 acres in Southern Arm (Enhancement Alternative Considered)	• Phased excavation of two large areas in southern arm and limited area in northern arm to provide sufficient tidal prism to maintain open river mouth • Maximize acreage for restoration of mudflat and salt marsh habitat • Two training berms incorporated to protect restored areas from sedimentation during floods	**Eliminated due to:** • Would have impacted most of the marsh habitat in southern arm • Resulted in loss of marsh habitat within footprint of two river training berms and associated hydraulic issues such as flooding • Extensive impacts to sensitive resources in the southern arm • Cost associated with removal of large amounts of soil • Change in site characteristics, such as sediment deposition, and management capabilities and conditions in the southern arm
Minimum Dredging Alternative (Enhancement Alternative Considered)	• Restore 1852 tidal prism with minimal dredging • Restore 560 acres in three phases o I: 20-acre experimental marsh and Oneonta Slough o II: 270 acres of tidal marsh o III: 290 acres of tidal marsh • River training berm in Phase II and III	**Eliminated due to:** • Phase II river berm would have overlapped Model Marsh area • Phase III river berm would have affected floodway and base flood levels by more than 1 foot • Would have impacted most of the salt marsh and disturbed salt panne in southern arm, including Belding's Savannah sparrow habitat

Table 3-2
History of Potential Components and Alternatives Considered for the Feasibility Study for TETRP II

Alternatives Evaluated	Alternatives Description	Components/Alternative Carried Forward or Eliminated
A	• Balance preserving existing disturbed but functional habitat with establishment of high functioning estuarine habitat. Incur the least amount of impact to existing high salt marsh and disturbed salt panne habitat.	**Carried forward as part of the proposed project in this FEIR/EIS, with modifications** • An initial phase for the proposed project has been identified north of Monument Road, with refinements • Berm along Tijuana River eliminated due to potential impacts to sensitive habitats and from recommendations by regulatory agencies • Transitional area included in proposed project, but reduced to preserve sensitive species habitat • Preservation areas have since been impacted by sedimentation This alternative has been designed to avoid impacting areas that currently support relatively higher quality native plant communities, including upland and transition zone
B	• Establish maximum area of high functioning estuarine habitat.	**Carried forward as part of Alternative 1 in this FEIR/EIS, with modifications** • An initial phase for the project has been identified north of Monument Road, with refinements • River berm eliminated due to changes to floodway • Through design of this alternative, deeper intertidal habitats (e.g., mudflat) that could contribute to increasing tidal prism in the southern arm of the estuary have been maximized
C	• Balance preserving existing disturbed but functional habitat with establishment of high functioning estuarine habitat. Similar to A, but designed to impact an intermediate amount of degraded high salt marsh and disturbed salt panne habitat.	**Eliminated due to:** • Proposed habitat distribution focused on lower intertidal wetland habitats, resulting in high excavation volumes • River berm eliminated due to changes to floodway • Preservation areas have since been impacted by sedimentation

Table 3-3
History of Potential Components and Alternatives Considered for TETRP II Phase I Initial Studies (Current Proposed Project)

Alternatives Evaluated	Alternatives Description	Components/Alternative Carried Forward or Eliminated
Alternative 1	• Restore approximately 87 acres of wetlands adjacent to Model Marsh • Avoid 0.5 acre of existing transitional and native upland habitat to the north of the restoration footprint • Emphasize deeper intertidal habitats to maximize tidal prism	**Carried forward as Alternative 1 in this FEIR/EIS**
Proposed Project	• Restore approximately 82 acres of wetlands adjacent to Model Marsh • Preserve approximately 1.1 acres of existing transitional and upland habitat within the restoration footprint and avoid an additional 3.5 acres of transitional habitat located to the east of Model Marsh • Emphasize vegetated marsh areas	**Carried forward as the proposed project in this FEIR/EIS**

- TETRP II – Phase I Initial Studies (current proposed project/proposed action)
  - Restore approximately 82–87 acres encompassing Model Marsh
  - Focus on establishing high functioning estuarine habitat
  - Maintain open river mouth conditions

3.3 ALTERNATIVES DEVELOPED FOR DETAILED ANALYSIS/PROPOSED PROJECT

Based on many years of study and planning as described in Tables 3-1, 3-2, and 3-3 and the project purpose and need and objectives as described in Section 1.3, two action alternatives were ultimately developed for in-depth study, consideration, and eventual inclusion in this environmental document.

Preferred Alternative/Proposed Project

In the studies leading up to the development of the DEIR/EIS, potential alternatives had various titles; however, the two alternatives selected as feasible for inclusion in the DEIR/EIS were generally titled Alternative 1 and Alternative 2 in the technical studies. After comparing and weighing the benefits and impacts of the feasible alternatives studied, the project team has selected Alternative 2 as the preferred alternative, subject to public review and input. Final identification of the preferred alternative will occur after the public review and comment period. This designation is made for procedural purposes and does not reflect a predisposition for implementation of that alternative. For reader clarity throughout this FEIR/EIS, what was previously referenced through the alternative development process as Alternative 2 has been renamed to the "proposed project." However, when referencing the technical studies that were prepared in advance of the DEIR/EIS, the alternative remains titled as Alternative 2 in those technical reports.

While the proposed project has been identified as the preferred alternative based on information and studies completed to inform the DEIR/EIS, alternatives identified in this document (Alternative 1, proposed project, and No Project/No Action Alternative) are analyzed at an equal level of detail in compliance with NEPA and to facilitate the ultimate selection of an alternative that reflects the most overall benefit to estuary functions and services.

Common Features

Alternative 1 and the proposed project would each include some common features, including the following:

- Preparation and maintenance of access roads and a staging area

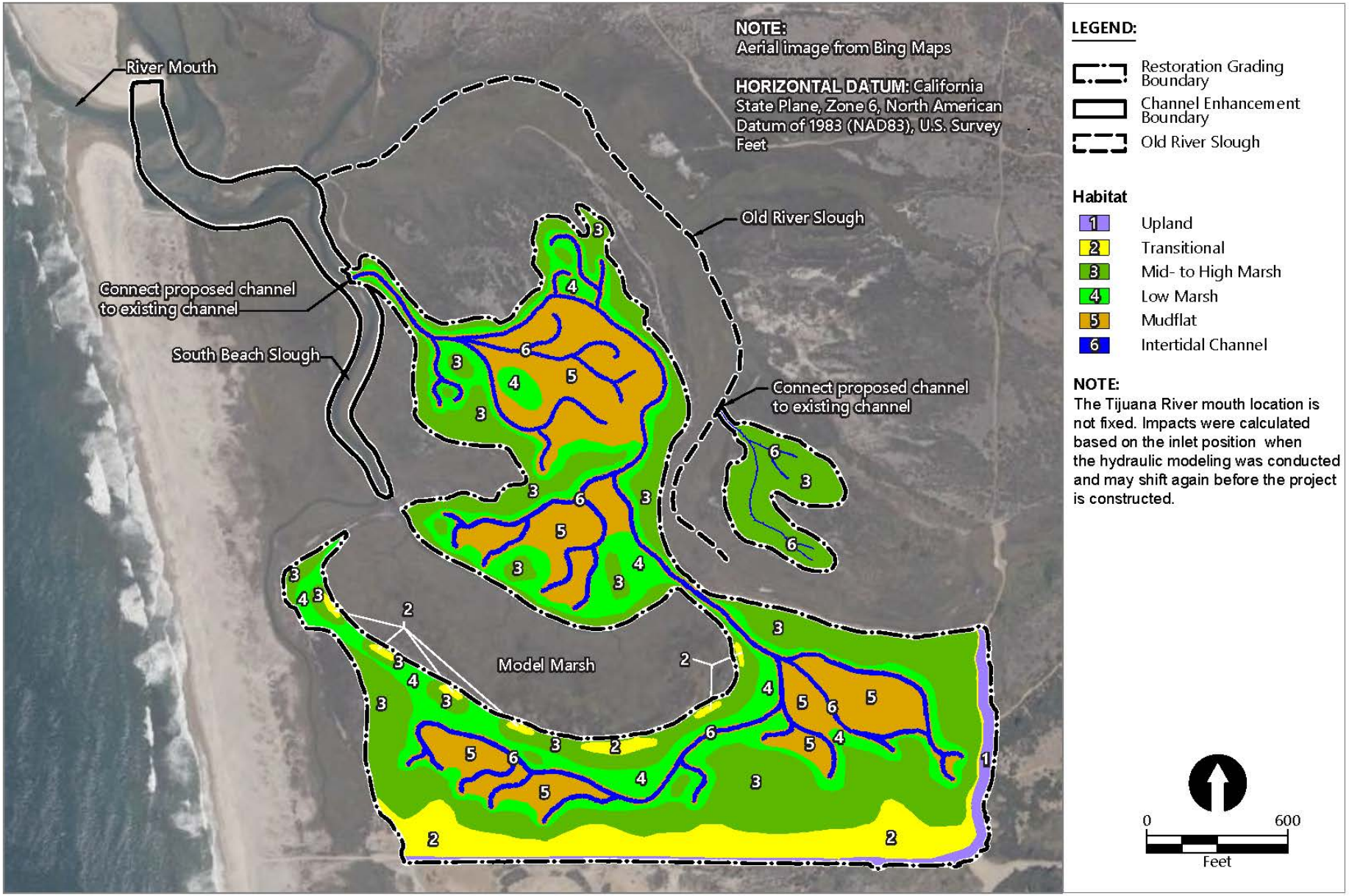
- Restoration of predominantly disturbed portions of the southern arm of Tijuana Estuary to tidal wetlands within a specific restoration footprint
- Channel enhancement to provide connections to restored wetland areas within a channel enhancement footprint, including a 20-foot temporary impact buffer to allow for access
- Development of a network of intertidal channels to convey tidal flows
- Connection of restored areas to Model Marsh
- Incorporation of transitional and native upland areas through restoration and preservation
- Consolidation of public access routes outside of restored areas
- Adaptive management of restored areas following project completion
- Excavation of accumulated sand at the river mouth, as needed, to provide tidal exchange within the estuary
- Management of soil excavated from the restoration and channel enhancement areas, emphasizing on-site beneficial reuse of material through beach nourishment within a beach placement footprint

3.3.1 Proposed Habitat Restoration/Establishment

Alternative 1

Alternative 1, which has a restoration footprint of 86.8 acres, was designed to maximize deeper intertidal habitats, such as mudflat, to increase tidal prism in the southern arm of the estuary—a primary goal of the proposed project. Alternative 1 is shown in Figure 3-1 and includes the following major features that differentiate this alternative from the proposed project:

- Restore approximately 86.8 acres, including 68.4 acres of intertidal mudflat, low salt marsh, and mid- to high salt marsh, 6.8 acres of intertidal channel, and 11.6 acres of native transitional and upland habitat;
- Establish tidal exchange within the restored wetlands by creating two connections to existing sloughs, including one to the South Beach Slough and one to the Old River Slough;
- Increase the tidal prism by approximately 1.5 million cubic feet (equivalent to approximately 34 acres covered by 1 foot of water); and
- Restore transitional habitat (wetland to upland) along the project site's southern boundary and on the south side of Model Marsh.
- Avoid 0.3 acre of transitional habitat and 0.2 acre of native upland habitat located immediately to the north of the northern project boundary; an area proposed for wetland restoration under the proposed project.



Source: Anchor QEA, 2021

606045881 3-1 Alternative 1 Proposed HabitatDistribution.ai dbrady 06/23/2022

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FIGURE 3-1
ALTERNATIVE 1 – HABITAT DISTRIBUTION

Alternative 1 would establish a network of intertidal channels to connect with existing tidal channels and the mouth of the Tijuana River. The primary tidal connection would be to the existing South Beach Slough, which feeds Model Marsh extending south of the river mouth (Figure 3-1). This connection would be deepened to increase tidal flows into the proposed restoration area and would provide adequate tidal influence for the intertidal habitat restored under this alternative. A smaller tidal connection located to the north and east of the main restoration area would connect to the existing Old River Slough to provide tidal influence for restored salt marsh habitat. To facilitate drainage of the restored wetlands during low tide, Alternative 1 would deepen the existing South Beach Slough to approximately +0.75 feet North American Vertical Datum of 1988 (NAVD 88). This work may be done using hydraulic equipment, conventional equipment, amphibious equipment, or a combination of these construction methods.

The restored wetland area would be connected to the existing Model Marsh, providing hydraulic and functional connectivity between the two areas. Alternative 1 would provide high tide refugia for roosting and nesting marsh bird species by establishing islands of mid- to high salt marsh and transition zone habitats within the low salt marsh (Figure 3-1). These would be placed in areas adjacent to channels to discourage terrestrial predators. The transitional area in the southern portion of the restoration area would provide a buffer between human/recreational uses and the wetland and would protect the wetland to some extent from sedimentation coming from upstream sources.

Research elements based on coordination with the SAT would be incorporated into Alternative 1 that (1) build off lessons learned in past modules, (2) better inform potential adaptive management of this phase, and (3) offer opportunities to learn lessons to apply to future restoration trajectories (both here and elsewhere). Such research elements include variations in slope of restored transition areas and establishment of “starter channels” incorporated into the design of Alternative 1 and the proposed project. The slopes of transition zone habitat would be varied from flatter to steeper within the restoration area to test the effects of slope on plant establishment. Starter channels would be constructed as shallow depressions as opposed to fully excavated channels to test whether, over time, erosion could yield a similar landform with lower initial cost.

Estuarine and salt marsh wetland habitats require a certain frequency of tidal inundation to establish and survive. These habitat breaks are driven by site elevations so excavation would be designed to specific elevations to establish the proposed wetland areas. Final ground elevations are based on the inundation frequency range associated with each coastal salt marsh habitat type proposed for this alternative, and considerations of tidal inundation frequency observed within nearby Model Marsh, as outlined in Table 3-4. Existing ground elevations in the project area range from approximately +2 to +20 feet NAVD 88. Generally, habitats range in decreasing elevation from upland, transitional, mid- to high salt marsh, to low salt marsh, to mudflats, and finally to intertidal channels and subtidal (submerged) lands. Reconfiguring the restoration area may be

accomplished by water-based equipment in some areas and land-based equipment (e.g., bulldozers, large backhoe, off-road rear dump trucks, amphibious excavators) in others. Limits of disturbance for Alternative 1 are shown in Figure 3-2.

Table 3-4
Habitats Restored under Alternative 1

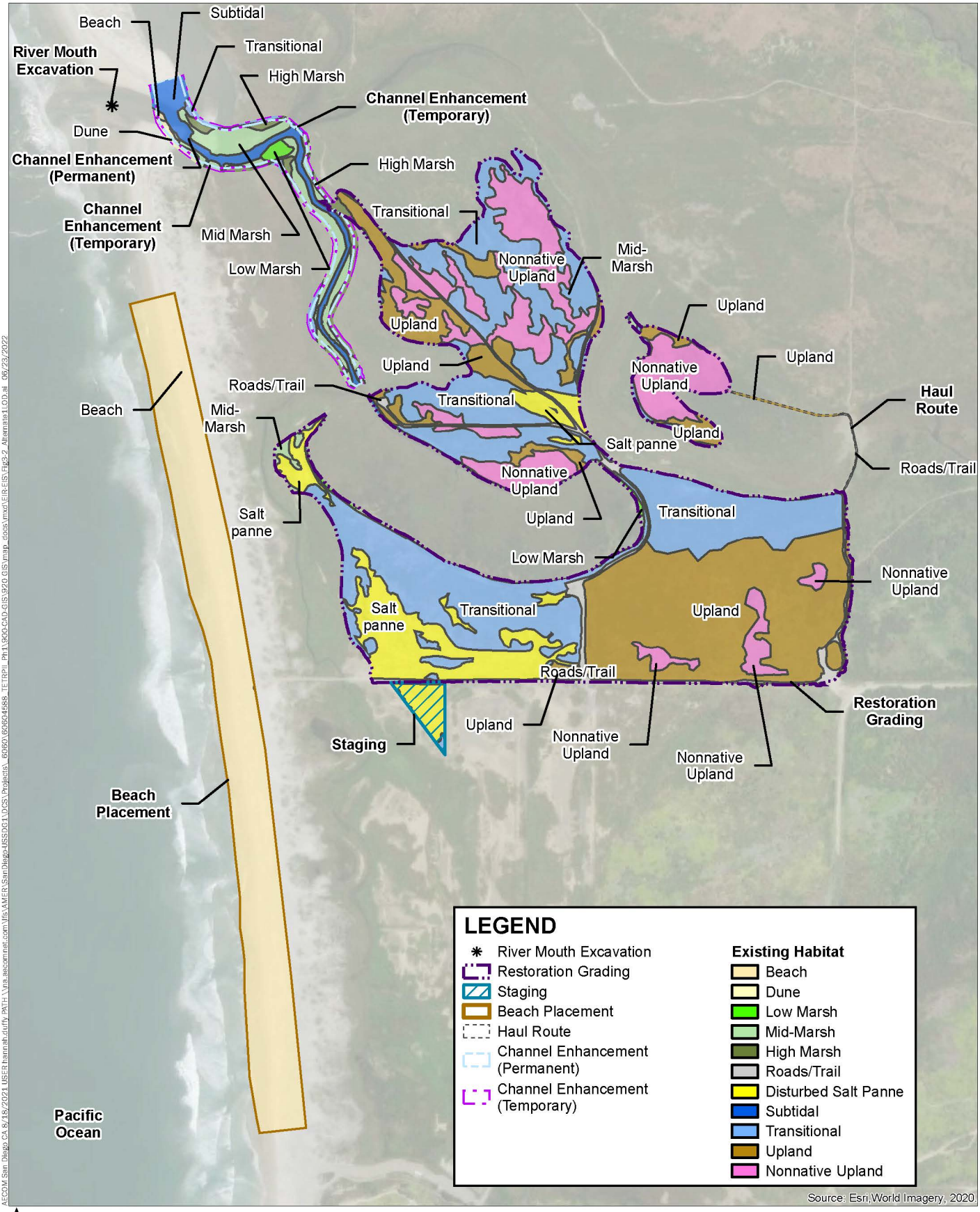
Habitat Type	Elevation Minimum (ft, NAVD 88)	Elevation Maximum (ft, NAVD 88)	Restored Habitat Distribution[1] (Acres)
Native Upland	9.0	20+	2.6
Native Transitional	7.0	9.0	9.0
Mid- to High Salt Marsh	5.0	7.0	34.8
Low Salt Marsh	4.5	5.0	15.6
Mudflat	3.5	4.5	18.0
Intertidal Channel	2.0	3.5	6.8
Total	**-**	**-**	**86.8**

[1] An additional 0.5 acre of transitional and native upland habitat located immediately to the north of the restoration footprint would be avoided under Alternative 1 but restored to wetlands under the proposed project.

Excavation to restore wetland habitats under Alternative 1 would generate approximately 585,000 cy of soil. In the process of soil removal, Alternative 1 would reuse excavated material to establish higher elevation transitional areas within the restoration footprint (approximately 5,000 cy). Depending on the characteristics of excavated material, the remainder (or portions thereof) could be used beneficially as a source of beach nourishment through beach placement. Beach nourishment would allow for nourishment of the littoral cell as well as support the development and maintenance of coastal barrier dunes, providing a protective function for the proposed restoration area to the east. While maximizing beneficial reuse of material on-site as beach nourishment is preferred, if soil quality of some excavated material is not adequate, material could be transported off-site for beneficial reuse at other project sites (i.e., Nelson Sloan Quarry) or for disposal (i.e., Otay Landfill). Soil management strategies are described further in Section 3.3.2.

Proposed Project

The proposed project, which has a smaller restoration footprint than Alternative 1, has been designed to avoid areas of transitional and native upland plant communities that would be restored to wetlands under Alternative 1. The areas to be avoided include approximately 1.1 acres of transitional to native upland habitat located within the northern portion of the project site and 3.5 acres of transitional habitat just to the southeast of the project footprint. The proposed project is shown in Figure 3-3 and includes the following major features that further differentiate the proposed project from Alternative 1:



Note: The Tijuana River mouth location is not fixed. Impacts were calculated based on the inlet position when the hydraulic modeling was conducted and may shift again before the project is constructed.

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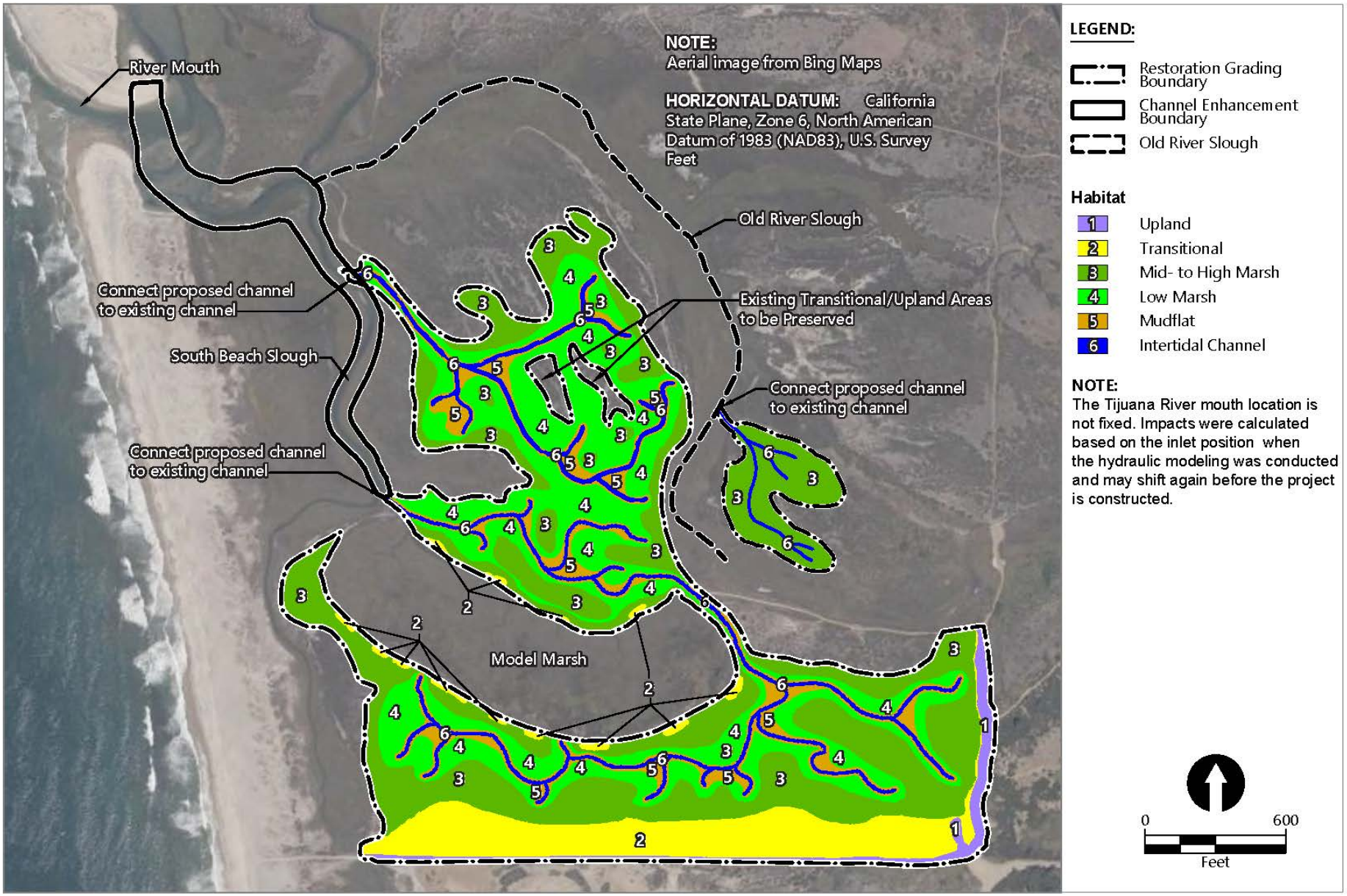
FIGURE 3-2
ALTERNATIVE 1 – LIMITS OF DISTURBANCE

- Restore approximately 82.5 acres of native habitat, including 62.8 acres of intertidal wetlands, 5.1 acres of intertidal channel, and 14.6 acres of native transitional and upland habitat;
- Emphasize the restoration of low and mid- to high salt marsh, with only limited areas restored to intertidal mudflat;
- Avoid approximately 4.6 acres of existing upland and transitional habitat located within and immediately adjacent to the restoration footprint;
- Establish tidal exchange within the restored wetlands by creating three connections to existing sloughs, including two to the South Beach Slough and one to the Old River Slough;
- Increase the tidal prism by approximately 1.9 million cubic feet (equivalent to approximately 44 acres covered by 1 foot of water); and
- Restore transitional habitat (wetland to upland) along the southern boundary of the project site and around the perimeter of Model Marsh.

The proposed project footprint, which encompasses approximately 83.6 acres of disturbed upland, transitional, and high marsh habitat, proposes to restore approximately 82.5 acres of disturbed upland habitat to intertidal wetland habitats and transitional habitat, while preserving approximately 1.1 acres of transitional and upland habitat within the project footprint (Figure 3-3). The transitional and native upland habitats to be avoided are located within the northern portion of the project site, while other areas of restored native transitional and upland habitats would generally be located in and around Model Marsh. Approximately 3.5 acres of transitional habitat located outside of the restoration footprint to the south of the Marsh Trail and east of Model Marsh would also be avoided.

Under the proposed project, a network of tidal channels would be established, with connections to existing tidal channels at three points, including two along the South Beach Slough and one at the Old River Slough (Figure 3-3). The primary tidal connection to the proposed project is the existing South Beach Slough, which would be deepened to increase tidal flows into the proposed restoration area. In addition, transition zone habitat would be restored along the southern portion of the restoration area and intermittently around the perimeter of Model Marsh. The primary differences between this alternative and Alternative 1 is a reduction of 11.6 acres in restored mudflat and an increase of 7.3 acres in low salt marsh under the proposed project; an increase in the total acreage of preserved versus restored habitats; an increase in the number of connections to existing tidal channels; and smaller excavation volumes and grading area, resulting in a larger tidal prism overall within the estuary. The elevations and acreage of each habitat proposed for restoration under the proposed project are presented in Table 3-5.



Source: Anchor QEA, 2021

60604588\Figure 3-3 Alternative 2 Proposed Habitat Distribution.ai dbrady 06/23/2022

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FIGURE 3-3
PROPOSED PROJECT – HABITAT DISTRIBUTION

Table 3-5
Habitats Restored Under the Proposed Project

Habitat Type	Elevation Minimum (ft, NAVD 88)	Elevation Maximum (ft, NAVD 88)	Restored Habitat Distribution (Acres)	Preserved Habitat within the Restoration Footprint (Acres)[1,2]
Native Upland	9.0	20+	2.8	0.1
Native Transitional	7.0	9.0	11.8	1.1
Mid- to High Salt Marsh	5.0	7.0	33.5	-
Low Salt Marsh	4.5	5.0	22.9	-
Mudflat	3.5	4.5	6.4	-
Intertidal Channel	2.3	3.5	5.1	-
Total	**-**	**-**	**82.5**	**1.1**

[1] Totals may not sum due to rounding.
[2] An additional 3.5 acres of transitional habitat located outside the restoration footprint would be avoided under the proposed project but restored to wetlands under Alternative 1.

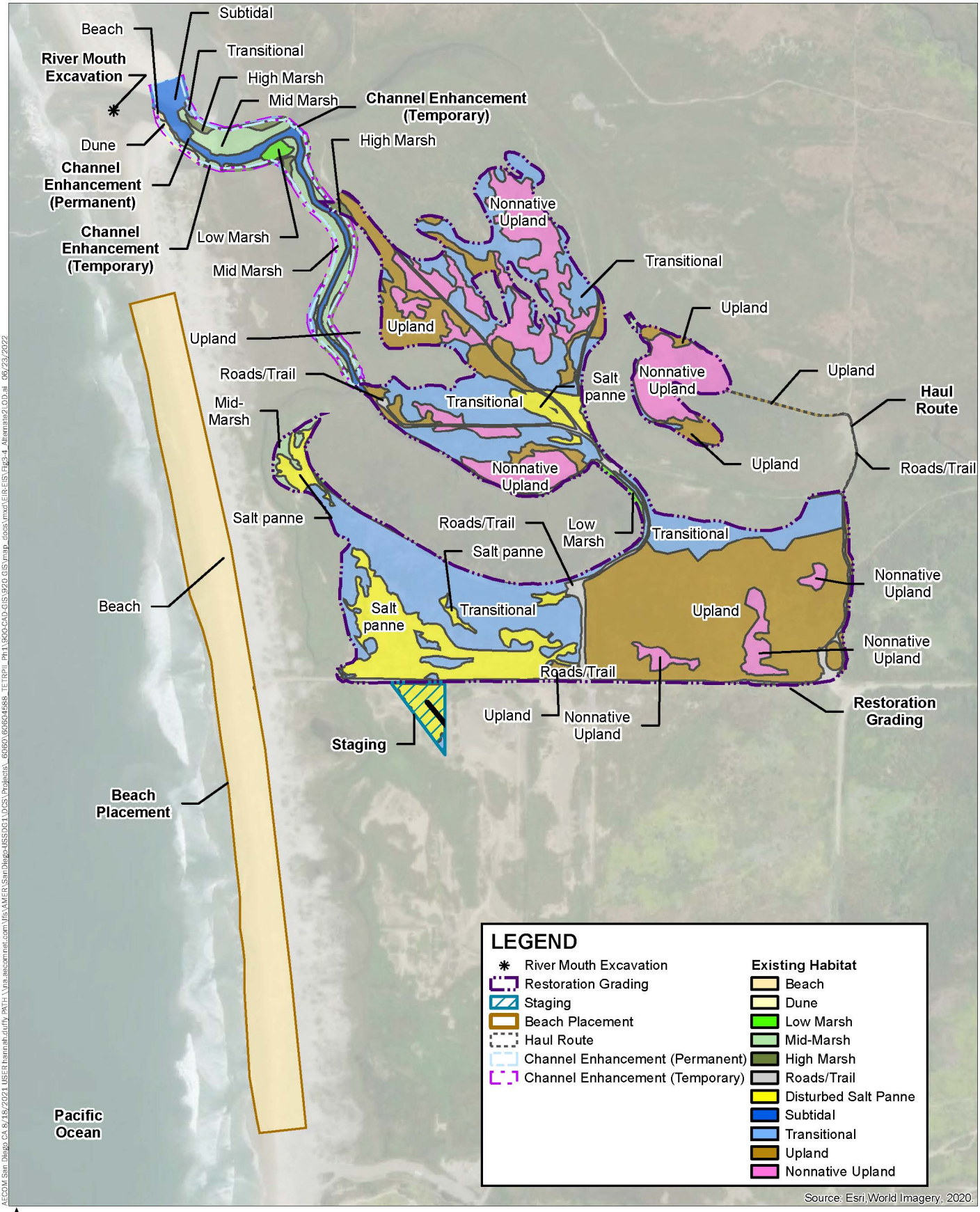
Excavation to restore native habitats under the proposed project would generate approximately 521,000 cy of soil, as shown by limits of disturbance in Figure 3-4. Approximately 7,000 cy would be used on-site to establish higher elevation transitional areas. As described for Alternative 1, the remainder of the excavated soil would either be beneficially reused on-site for beach nourishment or transported off-site for beneficial reuse at other project sites or to the landfill for disposal, as further described in Section 3.3.2.

To facilitate drainage of the restored wetlands during low tide, the proposed project would deepen the existing South Beach Slough to approximately +0.75 feet NAVD 88, similar to Alternative 1. The proposed project would also provide refugia for roosting and nesting birds by establishing islands of mid- to high salt marsh and transition zone habitats within the low salt marsh areas (Figure 3-3). Experimental manipulation of restored transitional areas and establishment of "starter" channels have also been incorporated into this alternative, as discussed under Alternative 1.

3.3.2 Project Components Common to Alternative 1 and the Proposed Project

Soil Management

As discussed, establishment of proposed habitats requires the excavation and net export of soils from the restoration footprint and channel enhancement area under both alternatives, with Alternative 1 requiring up to approximately 580,000 cy and the proposed project requiring up to approximately 514,000 cy. Soil management is therefore a large component of the project; five



Note: The Tijuana River mouth location is not fixed. Impacts were calculated based on the inlet position when the hydraulic modeling was conducted and may shift again before the project is constructed.

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FIGURE 3-4
PROPOSED PROJECT – LIMITS OF DISTURBANCE

options have been identified for potential management of excavated soils, as described below in Table 3-6 and Table 3-7. Option 1 relies on transport of soils off-site for disposal at a landfill and represents the most conservative option for impacts analysis from the perspective of trucking needs. Since the project is a restoration project, however, emphasis is placed on beneficial reuse of material in the other options. Option 2 would transport material to the Nelson Sloan Quarry or other approved project sites, and allow for placement under the currently proposed Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project, which would restore the landform and native habitat of a local abandoned sand and gravel quarry to habitat over time. The project is currently proposed and is anticipated to be approved prior to TETRP II Phase I implementation. Other projects within the vicinity may also provide an opportunity for beneficial reuse depending on their status and soil characteristics requirements. Options 3 through 5 evaluate the potential beneficial reuse of suitable excavated material for beach nourishment. These three options would also support the project objective to restore beaches adjacent to the site and reflect the historical pattern in which much of this trapped material would have likely made it to the beach when a larger tidal prism existed. Therefore, Options 3 through 5 are prioritized as most desirable and are the preferred strategy for soil management during project implementation, with Option 5 as the proposed strategy to maximize on-site beneficial reuse. Volumes associated with these three options are estimated based on what type of material would ultimately be identified as suitable for placement in those areas by regulatory agencies.

Generally, material has not been considered suitable for beach nourishment if it contains rock, cobble, or gravel with greater than 20% fine-grained sediment defined as silt and clay. Between 2008 and 2016, a number of efforts were made to facilitate increased beneficial reuse of sediment with higher proportions of fine-grained sediment. In 2008 and 2009, the Tijuana River Estuary Fate and Transport study was implemented as a pilot study on the beach adjacent to the proposed project site and was monitored for adverse environmental effects. The project placed a total of 45,000 cy (two events of 10,000 cy and 35,000 cy) in the swash zone where the waves meet the beach. No significant impacts to the environment were identified as part of the Fate and Transport study (Everest International Consultants, Inc. 2017) and indicated the average time that fine sediment remained within the swash zone and nearshore was only 3 to 4 hours (Warrick *et al.* 2012). Options 3 through 5 reflect the opportunity to use the results from the Fate and Transport study to guide beneficial reuse options under TETRP II Phase I, utilizing similar locations and placement methods for material that may have been considered unsuitable for beach nourishment in the past.

Table 3-6
Alternative 1 – Soil Management Earthwork Quantities by Option (cy)

Option	On-site: Transitional	On-site: Beach	Off-site: Nelson Sloan Quarry*	Off-site: Landfill
1	5,000	-	-	580,000
2	5,000	-	580,000	-
3	5,000	112,000	468,000	-
4	5,000	167,000	413,000	-
5	5,000	322,000	258,000	-

*or other approved project sites

Table 3-7
Proposed Project – Soil Management Earthwork Quantities by Option (cy)

Option	On-site: Transitional	On-site: Beach	Off-site: Nelson Sloan Quarry*	Off-site: Landfill
1	7,000	-	-	514,000
2	7,000	-	514,000	-
3	7,000	101,000	413,000	-
4	7,000	158,000	356,000	-
5	7,000	305,000	209,000	-

*or other approved project sites

Option 1 – Landfill Disposal

Under Option 1, excavated materials may be transported to Otay Landfill for disposal, either in combination with or independent of beneficial reuse soil management strategies. As noted in Tables 3-6 and 3-7, up to approximately 580,000 cy and 514,000 cy of material for Alternative 1 and the proposed project, respectively, may be disposed of at this location. Beach and South Beach Trails, as well as Monument Road, would be used for transport to Otay Landfill, with connections to I-5 via Hollister Street and/or Dairy Mart Road. During excavation of material from the restoration site, up to 254 truck trips per day (round trips) associated with Alternative 1 or 225 truck trips per day resulting from the proposed project are anticipated for transport. Hauling activities would occur for approximately 6 months under this option.

Option 2 – Nelson Sloan Quarry or Another Approved Project Site(s)

Under Option 2, material would be transported via dump trucks using Beach and South Beach Trails and Monument Road for delivery to Nelson Sloan Quarry, either in combination with or independent of disposal at a landfill or other beneficial reuse soil management strategies. Material would be beneficially reused within the quarry as part of the proposed Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project currently being developed by CSP. Material could also be potentially transported for beneficial reuse at other approved project sites. Volumes similar to those identified for Option 1 would be required for transport, and the number of truck

trips is assumed the same for both options. The duration for transport under Option 2 would be the same as Option 1 (approximately 6 months) but could occur over a shorter distance if the destination is the Nelson Sloan Quarry or another site located in proximity to the restoration area.

Option 3 – 5 – Beach Placement

As noted above, Options 3 through 5 would prioritize beach nourishment, and would place excavated material within the swash zone or on dry portions of the beach depending on ultimate sand content and grain size of material available for beneficial reuse. This strategy is preferred because it would support the project objective of beach restoration and would support barrier dune development as well as minimize the need for transport of material longer distances from the project site. Preliminary soil characterization studies have been used to estimate the volumes of various sediment types within proposed excavation areas associated with TETRP II Phase I. Options 3 through 5 allow for a range of possible scenarios for beneficial reuse incorporating a beach nourishment component, depending on the ultimate definition of material that is considered suitable for beach nourishment by regulatory agencies. Options 3 through 5 allow for incrementally increasing volumes of excavated material to be beneficially reused for beach nourishment. Under Option 3, material with 90% sand or more would be reused, while Option 4 would increase that volume to allow for material with more than 75% sand to be reused. Option 5 is the most inclusive and would allow for the most beneficial reuse; it would include material containing more than 51% sand to be used for beach nourishment. Material with higher sand content would be targeted for placement on the dry beach (e.g., material that contains more than 75% sand). Lower sand content material (containing between 51% and 74% sand) would be placed in the swash zone following a similar methodology as the previous Fate and Transport study. As noted during that study, the majority of fine sediment was transported far from the placement site and/or to water depths greater than 10 meters, where fine sediment represents a substantial portion of the bed material. However, it also noted that projects may want to try to take advantage of larger wave conditions during fall and winter to encourage transport even farther from the site (Warrick *et al.* 2012). Therefore, to facilitate the offshore movement of the fine-grained sediment (silt and clay) portion of material placed on the beach, beach placement activities would likely be conducted during the late fall through early spring when wave conditions are more energetic and, therefore, are more conducive to mixing. However, depending on construction constraints, placement throughout the year may also occur in areas where no nesting has been confirmed (PDF-9). The thresholds used for each option outlined in Tables 3-6 and 3-7 above include:

- Option 3 – ≥ 90% Sand – beach placement in the upper beach.
- Option 4 – ≥ 75% Sand – beach placement in the upper beach.
- Option 5 – ≥ 51% Sand – beach placement both in the swash zone (51% to 74% sand) and upper beach (≥75%).

Given these criteria, between 112,000 cy and 322,000 cy of material could be used for beach nourishment under Alternative 1, while between 101,000 cy and 305,000 cy of material could be

available for beach nourishment under the proposed project. Remaining material would be transported off-site to the landfill, Nelson Sloan Quarry, or other approved projects, as described above under Options 1 and 2, but the proposed project would require a shorter duration in hauling activities because of the decrease in material volumes. Options 3 through 5 would result in trucking operations extending from approximately 5 to 2.5 months, respectively.

For beach nourishment under these options, materials considered suitable for placement would be transported from the restoration site via dump trucks to the beach along the existing Beach Trail. For material with suitably high sand content (as described above), placement along the beach above the high tide line would occur. Trucks would bring sand to the beach and distribute it along the beach placement footprint. Material would then be spread across the beach profile, avoiding areas supporting native dune-building plant species, using bulldozers and similar equipment. For material that contains lower proportions of sand (greater than 51% sand), placement within the swash zone is anticipated similar to the Fate and Transport study. Material would be trucked to the beach, then placed just at the edge of the water line so vehicles are not required to enter the water. High tides and waves would then redistribute the material after placement.

Material removed from existing channels may also be dredged and transported via pipeline to the beach for nourishment purposes through the river mouth or along Beach Trail. Hydraulically dredged material delivered via pipeline is generally delivered in slurry form and is primarily water. To minimize turbidity during placement on the beach via a pipe, a temporary work berm would be constructed parallel to the shoreline to form a settling basin where dredged material would be discharged. Pipeline placement may work up and down the coast to fill in material throughout the beach placement footprint. Once material is placed along the beach, equipment such as bulldozers, scrapers, and graders may be used to spread material evenly throughout the beach placement footprint.

While preliminary soil testing indicates the soil management options above are feasible, additional testing to confirm soil characteristics would be required prior to placement, and may lead to refinements in the ultimate soil management strategy implemented as part of the project. Sediment testing would be conducted to confirm specific volumes of material with grain size suitable for placement on the beach. The need for any additional testing of the physical, chemical, and/or biological characteristics of material proposed for placement on the beach or in the swash zone will be determined by the permitting agencies. If the sediment is determined suitable for on-site beneficial reuse, it will be placed on the beach and/or in the swash zone. As noted above, Option 5 would maximize on-site beneficial reuse through beach nourishment, is the preferred soil management strategy, and is the proposed option for the project. Regulatory requirements during the permitting phase may limit the amount of material that can be placed on the beach, however, and some material may need to be transported off-site for beneficial reuse or disposal. A combination of the proposed soil management options would likely be implemented depending on

the suitability of materials, project phasing, and availability to dispose of soil at the locations identified in Options 1 through 5. For the purposes of the DEIR/EIS, a comprehensive conservative analysis was provided for relevant resources through evaluation of the range of options, including the off-site disposal option to Otay Landfill (e.g., Transportation, Air Quality, and Noise) and maximum beach nourishment strategies (e.g., Biological Resources and Coastal Processes).

Staging/Haul Route

A staging area would be established for the proposed project south of Beach Trail, primarily within existing disturbed salt panne habitat. Access routes such as Monument Road and Beach and South Beach Trails would be used to gain entry to the project site. Existing access road preparation and/or maintenance may be required to provide adequate and safe access for construction vehicles. Activities associated with preparation and maintenance during construction would remain within existing road edges where there is current access. Surface preparation and maintenance through construction may be required depending on road condition, but would remain within the existing roadway footprint. A 12-foot-wide road along the east side of the site would also be temporarily established to access the isolated restoration area located along Old River Slough. While this access road would be located within the restoration site and existing disturbed areas to the extent possible, it would require some temporary expansion into existing habitat. After implementation of the proposed project, staging and haul route areas would be restored to the original pre-construction conditions and/or better (e.g., planted with native species) per PDF-12. Temporary staging and haul route areas are shown in Figure 2-2.

As-Needed Removal of Sand from the River Mouth

An ongoing management activity within the estuary is the periodic as-needed removal of sand from the estuary's river mouth to provide continual tidal exchange. This activity, which is currently implemented in accordance with an existing permit from the Corps (SPL-2011-00383-RRS), is proposed to continue as a post-restoration management component of the project. Periodic excavation of the channel at the mouth of the Tijuana River may be necessary to continue in the future in response to closures or partial closures of the river mouth and to facilitate adequate tidal exchange within the estuary. Removal of sand, which would involve excavating accumulated sand and/or sediment at the mouth of the river, may occur under both Alternative 1 and the proposed project and is evaluated as part of TETRP II Phase I. Material removed from the channel is expected to consist almost exclusively of sand that enters the river mouth primarily from littoral cell transport and wave action. This material, which has been removed periodically in the past, is expected to continue to be suitable for placement on the beach. The proposed activity includes removal of up to 10,000 cy of sand, as needed, from the river mouth. The sand would be placed on adjacent unvegetated barrier dunes or along the shoreline either north or south of the mouth of the estuary above the high tide line. Access needed to implement this activity would be from the

south end of Seacoast Drive in Imperial Beach; however, access from the south side of the river mouth may be necessary depending on site conditions. If needed, this access would be via Beach/South Beach and Coast North/South Trails. Equipment would drive along the high tide line of the beach until reaching the river mouth. Land-based equipment such as excavators and front-end loaders would be used to remove and transport the material from the river mouth and deposit it along the upper reaches of the beach.

Sea Level Rise Habitat Conversion

A sea level rise analysis was conducted to estimate habitat conversion over time within the restoration area for each alternative. The Ocean Protection Council's 2018 Sea Level Rise Guidance (CNRA and OPC 2018) medium-high risk aversion scenario was used, with projections of 2.0 and 7.1 feet of sea level rise (by 2050 and 2100, respectively). These analyses consider changes in tidal hydraulics and increases in water level projected for the open coast, without concurrent increases in wetland elevation. Thus, results are best interpreted as amounts of relative sea level rise when water levels are 2.0 or 7.1 feet above the future marsh surface. This would likely occur later than the nominal 2050 and 2100 dates projected for the open coast due to processes associated with "living shorelines" (e.g., sediment trapping and accumulation of biological material).

Under both alternatives, with 2.0 feet of relative sea level rise, much of the immediate restoration area would be converted to intertidal channels, with substantial losses in vegetated marsh areas. The proposed project would increase mudflat areas and retain slightly more vegetated marsh compared to Alternative 1, but would still convert primarily to intertidal channels. Transitional area would also decrease sharply. With 7.1 feet of sea level rise, conversion to habitats favoring higher inundation frequencies would continue, with 0.5 acre of transitional habitat and less than 1 acre of vegetated marsh remaining in the restoration area under each alternative (Anchor QEA 2021b).

It is important to note that habitat estimates are focused on tidal hydraulics, and do not necessarily incorporate other potential climate drivers such as fluvial flow, wave direction and magnitude, and river mouth hydraulics.

Additionally, transitional area anticipated to convert to wetland over time has been identified outside of the immediate restoration area boundary but within the larger Tijuana River Valley. Thus, the gradual conversion of the project area to lower elevation habitats which have been substantially lost over the last 150 years (Safran *et al.* 2017), coupled with marsh transgression in adjacent areas (in which upland vegetation is replaced by salt marsh plants as sea level rises and tidal influence expands), would support the overall structure and function of the estuary as a system.

3.3.3 No Project/No Action Alternative

The No Project/No Action Alternative is the circumstance under which the proposed project does not proceed. The impacts of the No Project/No Action Alternative are analyzed by projecting what would reasonably be expected to occur in the foreseeable future if the proposed project were not approved. The purpose of describing and analyzing the No Project/No Action Alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.

Under the No Project/No Action Alternative, the proposed TETRP II Phase I restoration of the estuary would not be completed. No removal of soil or vegetation would occur to restore or establish habitat for the enhancement of biological and hydrological functions within the project site. New or widened channel connections would not be implemented. No comprehensive maintenance regime or adaptive management plan would be implemented. Inputs that cause disturbance of sensitive habitats and wetland function would remain relatively uncontrolled as under the existing condition. Periodic removal of sand from the estuary's river mouth could continue to occur under separate approvals, but activities would be restricted to the river mouth and would not extend into the estuary. It is anticipated that the estuary would continue to lose wetland habitat to sedimentation and experience further reduced tidal prism as development continues within the upper watersheds of trans-border canyons that terminate at the estuary. Tidal channels would continue to accumulate sediment and may close intermittently, resulting in potentially negative impacts to tidal habitats. The estuary would continue to be affected by periodic coastal wave action that may result in erosion or overtopping of the barrier beach that shields the wetlands from continuous wave action and impacts from sea level rise. Furthermore, the No Project/No Action Alternative would be susceptible to sea level rise, including increased frequency and/or duration of river mouth closures as excessive sedimentation from the watershed has substantially reduced the tidal prism of the estuary and, therefore, the estuary's ability to maintain an open river mouth (USFWS 2017). Subsequent impacts associated with river mouth closures may include increased flooding risk, decreased water quality, eutrophication, and loss of nesting habitat and refugia for sensitive species. In general, the No Project/No Action Alternative is not anticipated to be resilient to sea level rise, both now and under future scenarios.

3.3.4 Construction Methods, Schedule, and Project Design Features

This section provides a description of potential construction methods for the project based on the Construction Methods and Soil Management report (Anchor QEA 2021a). The first step in the sequence of construction work would be to mobilize equipment to the project site, develop access to the construction areas, and prepare the staging area. The staging area would be cleared, grubbed, and surfaced, as needed, to support the construction equipment and materials. The access/truck routes would be enhanced and strengthened, as necessary. The project site would be cleared and grubbed prior to excavation. The proposed project would likely involve dry excavation in the restoration area

and wet excavation in the existing channels. Excavation in the restoration area and disposal of excavated materials would occur simultaneously if excavated materials are dried and are suitable for beach nourishment or upland placement. Otherwise, excavated material may be temporarily stockpiled at the staging area or temporarily within the project area. Existing tidal channel excavation could occur independent of the construction schedule of the restoration area. Materials dredged from the existing channel are anticipated to be pumped to the beach for beach nourishment. If material excavated from the existing channel is not suitable and must be transported off-site for upland placement or disposal, it would be left on-site to dry out before transport. Planting would begin upon completion of earthwork.

Existing high ground at the junction of the proposed tidal channel helps to keep tidal and fluvial water from entering the restoration area. To maintain a water barrier between the project site and tidal channels during excavation, the area at the channel junction would not be cut until excavation of the restoration area is complete. Construction equipment would be demobilized from the site as a final step.

The contractor would follow local jurisdiction time restrictions for construction equipment operation. It is anticipated construction would generally take place Monday through Friday from 8 a.m. to 6 p.m. Work may or may not occur on holidays, depending on the contractor and local jurisdiction restrictions. In addition, construction activities would be likely continuous with internal phases to restrict vegetation clearing and grubbing to outside the breeding season (February 15–September 15), and to limit beach nourishment activities to outside the breeding season unless a qualified biologist has confirmed no active nesting is occurring in proximity to placement sites (PDF-9). The construction windows for specific site locations would be determined by CSP and the USFWS during final project design. In addition, the construction window schedule may change during construction depending on actual nesting activities that occur at the time of construction (i.e., construction activities phased to avoid the breeding season [February 15–September 15]). For the purpose of assessing environmental impacts, a preliminary construction schedule both with continuous work through the breeding season (a duration of approximately 11.5 months) and a two-phased schedule that avoids the breeding season (a duration of approximately 19 months) was developed for the proposed project based on the assumptions and information above. The schedule for each option is presented in Table 3-8.

Table 3-8
Preliminary Construction Phasing

Activity	Duration (continuous)	Duration (two phases to avoid breeding season)
Mobilization	1 month	1 month
Construction	8.5 months	4.5 months
Nesting Season		6.5 months
Remobilization		1 month
Construction		4 months
Demobilization	2 months	2 months

The type of equipment used to construct the proposed project and the number of various pieces of equipment would ultimately be determined by the contractor during construction. A preliminary list of construction equipment was developed to provide the information needed to evaluate potential environmental impacts. The preliminary equipment includes the following: backhoes, loaders, scrapers, bulldozers, graders, excavators, dump trucks, amphibious excavator/cutterhead dredge, and pipeline.

Due to the wetland habitat restoration nature of the project, an effort has been made to proactively incorporate measures into the project to minimize and avoid, where possible, impacts to natural resources. These project design features (PDFs) represent a commitment by the project proponent to construct the project in an environmentally sensitive way. Some PDFs are incorporated to avoid or minimize a potential significant impact proactively through design, but others are additional measures that support the overall restoration and enhancement objectives of the proposed project without being tied to a specific potential impact.

The project applicant commits to the inclusion of these features, which would be implemented by the contractor or other parties before, during, and after construction. Inclusion of these PDFs is considered in the determination of CEQA and NEPA conclusions as discussed in Chapter 4. These features are summarized in Table 3-9 and include the purpose, timing, and responsibility for implementation of each PDF.

Table 3-9
Project Design Features

PDF #	Project Design Feature	Purpose	Timing	Implementation Responsibility
PDF-1	Signage will be placed at key locations such as the Visitor Center, horse staging areas, and parking lots to inform the public of temporary construction vehicle use along trail routes and potential trail closures. Signage would include descriptions of construction equipment and duration of construction, so the public is aware of the purpose of the activities.	Provide public safety during construction; notify and prepare trail users for visual presence of construction equipment	Prior to and during construction	Contractor
PDF-2	Portions of the beach placement footprint will be closed temporarily to the public during construction and closures will shift as activities move along the shoreline.	Provide public safety during construction	During construction	Contractor
PDF-3	Pipeline segments crossing the beach will be covered at consistent intervals to facilitate access from the back beach to the water, as necessary.	Maintain public beach access	During construction	Contractor
PDF-4	Coordinate with other agencies' emergency response personnel, as applicable, to make them aware of the proposed project schedule and timeframe, and identify alternative emergency access routes throughout construction.	Minimize disruption to emergency response services	Prior to and during construction	Contractor
PDF-5	Construction equipment and vehicle engines will be maintained in good condition, properly tuned per manufacturers' specifications, and idling time would be minimized.	Minimize energy use	During construction	Contractor
PDF-6	Stake construction areas and no construction zones. Limit construction equipment and vehicles to within these limits of disturbance.	Protect sensitive habitat areas; reduce public safety hazards.	During construction/ Maintenance	Contractor
PDF-7	Equip construction equipment, fixed or mobile, with properly operating and maintained mufflers.	Minimize noise impacts.	During construction/ Maintenance	Contractor
PDF-8	House exposed engines on dredging equipment to the greatest extent possible.	Minimize noise impacts.	During construction/ Maintenance	Contractor

PDF #	Project Design Feature	Purpose	Timing	Implementation Responsibility
PDF-9	Allow for continuous construction, with construction phases timed to (1) restrict vegetation clearing and grubbing to outside the breeding season (begins February 15 for marsh species like the light-footed Ridgway's rail and Belding's Savannah sparrow through September 15) and (2) limit beach nourishment activities to outside the breeding season (begins March 15 for western snowy plover and April 15 for California least tern through September 15) unless a qualified biologist has confirmed no active nesting is occurring in proximity to placement sites, in coordination with CSP and Refuge managers.	Minimize impacts to sensitive wildlife species and their habitats.	During construction	Contractor
PDF-10	Have Biological Monitor, experienced with each of the listed species, on-site during construction; frequency may vary depending upon activity but will include weekly surveys for nesting birds during the breeding season. If active nests are observed, a fenced buffer will be established and construction activities limited in proximity of occupied nests until the nest is no longer active. While clearing and grubbing activities are occurring, walk along the impacted habitat ahead of machinery to flush resident birds and other wildlife. No project construction will occur within the fenced nest zone until the young have fledged, are no longer being fed by parents, have left the nest, and/or will no longer be impacted by the project.	Confirm implementation of biological permit conditions, design features, mitigation measures, and applicable construction specifications.	During construction	Qualified biologist
PDF-11	Prior to initiating construction, identify sensitive "no construction zones" and fence or flag those areas	Minimize impacts to sensitive habitat areas.	Prior to construction/ Maintenance	Qualified biologist/ Contractor

PDF #	Project Design Feature	Purpose	Timing	Implementation Responsibility
PDF-12	Temporary facilities used for contractor activities will be returned to either original or enhanced conditions upon completion of the project to the greatest extent possible, if not needed for future maintenance activities.	Minimize land use conflicts and access issues.	Post-construction	Contractor
PDF-13	Construct longitudinal training dikes at sand placement sites if delivered to dry beach areas through a pipeline.	Reduce nearshore turbidity.	During construction	Contractor
PDF-14	Monitor water quality per RWQCB 401 Certification; if outside parameters then implement operational controls or halt beach nourishment, as necessary.	Verify permit compliance.	During construction per RWQCB 401 Certification	Qualified biologist
PDF-15	If beach nourishment activities are scheduled during the grunion spawning period, assess habitat suitability for grunion spawning prior to placement. During the grunion spawning period of March through August, the proposed beach placement footprint will be monitored for grunion runs, unless the beach consists of 100% cobble (i.e., there is not sand on the beach). Grunion monitoring will be conducted by qualified biologists for 30 minutes prior to and 2 hours following the predicted start of each spawning event. If a grunion run consisting of more than 100 fish (i.e., >W-1 on the Walker Scale) is reported, the biologist will coordinate with the resource agencies to determine appropriate avoidance and minimization measures (e.g., relocation/rescheduling of work/equipment or specification of acceptable vehicle routes).	Minimize impacts to grunion.	March through August and per CDFW annual pamphlet *Expected Grunion Runs* (CDFW 2021)	Qualified biologist
PDF-16	Maintain horizontal access along the back beach where adjacent vertical access is not available, to the extent feasible.	Maintain public beach access.	During construction	Contractor

Construction within the proposed restoration and channel enhancement area would primarily involve removing vegetation and altering existing ground elevations. Construction methods for the project, including soil management, were developed based on project requirements and site constraints, as well as experience with similar previous projects. Standard construction practices would be utilized for the project and are described in Table 3-10.

Table 3-10
Standard Construction Practices

Implement a public information program to assist TRNERR, Border Field State Park and Tijuana Slough NWR users and the surrounding community in understanding the purpose of the proposed project and disseminate pertinent project information via a public outreach program that includes a designated webpage in languages accessible to the community that address restoration, construction schedules, and haul truck activity. Notify all residents located along selected haul routes once the routes are established. Notification would include a web address where additional information, updates, and contact information is provided.
Coordinate with utility service providers for avoiding utilities infrastructure and/or relocating infrastructure.
Have Resident Engineer or designee on-site during construction to confirm compliance with permit conditions and construction specifications.
Remove sources of impounded water resulting from construction equipment (if any) and confirm compliance with construction specifications regarding no ponding.
Restrict access to active construction areas and staging yards to maintain public safety (e.g., portions of trails).
During off working hours, secure heavy equipment and vehicles in staging areas or areas with restricted access.
Conduct equipment fueling and maintenance at designated fueling stations away from publicly accessible areas.
Prepare project Storm Water Pollution Prevention Plan (SWPPP) and implement best management practices (BMPs) and monitoring requirements identified in SWPPP (e.g., dust control measures).
Require heavy equipment operators to be trained in appropriate responses to accidental fires and fuel or fluid spills.
Provide fire suppression equipment and spill kits on board vehicles and at the worksite.
Provide emergency communication equipment for site personnel.
Have on-site workers attend a pre-construction meeting to review project design features and mitigation measures prior to the commencement of demolition, construction, and/or land disturbance activities.
Have on-site workers attend an environmental training session that will discuss the sensitive resources in the project area and the mitigation measures designated to protect them.
Minimize idling times by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage will be provided for construction workers at access points.
Prepare a “Traffic Control Plan,” approved by local agencies, as appropriate, to avoid and minimize traffic impacts along arterial roadway sections, as well as minimize impacts for residents located adjacent to haul routes. The plans will be prepared in accordance with the California Manual of Uniform Traffic Control Devices and current standards and best practices of the reviewing and approving agencies.
Implement measures to avoid the inadvertent spread of invasive species in association with equipment and other vehicles moving between various locations. Such measures may include inspection and cleaning of construction equipment. Heavy equipment will be washed and cleaned of debris prior to entering the restoration site to minimize the spread of invasive weeds.

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CHAPTER 4.0
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

A total of 18 environmental issue areas are evaluated in this chapter. Sections 4.1 through 4.18 describe the affected environment, or existing conditions, of the project study area for each topic analysis, and disclose the environmental consequences associated with implementation of the proposed project, including alternatives. The organization of each of these sections is described in more detail below.

Each individual topic analysis section is organized by (1) Affected Environment; (2) CEQA Thresholds of Significance; (3) Environmental Evaluation; and (4) Avoidance, Minimization, and Mitigation Measures.

1. Affected Environment provides a description of existing conditions before project implementation and serves as the general baseline physical conditions for analysis of project impacts. More detail regarding the baseline is provided following this overview. This section is consistent with NEPA terminology but corresponds to Existing Conditions under CEQA.

2. CEQA Thresholds of Significance defines specific criteria used to determine whether an impact is or is not considered significant under CEQA. CEQA requires that an EIR include a determination of significant effects and identification of feasible mitigation measures to minimize those effects, while NEPA does not. According to NEPA regulations, when considering whether the effects of a proposed action are significant, agencies shall analyze the potentially affected environment and the degree of the effects of the action (40 CFR § 1501.3(b). In an EIS, the magnitude of impact is evaluated, and no further judgment of its significance is required. Therefore, in this document the thresholds of significance are directly associated with the analysis under CEQA to determine the potential significant effects of the proposed project and its alternatives. Each CEQA significance threshold is identified with a letter and discussed as an independent issue with conclusions drawn specific to each threshold.

   CEQA thresholds are at the discretion of the CEQA Lead Agency. Questions listed in Appendix G of the CEQA Guidelines were considered for use as significance thresholds to characterize impacts, although different thresholds are sometimes used in Chapter 4 to reflect the unique and dynamic nature of habitat restoration and soil management activities. Thresholds not developed from Appendix G have been derived from previous lagoon enhancement projects, including the San Dieguito Lagoon W-19 Restoration

Project EIR (SCH #2014081095) and the San Elijo Lagoon Restoration Project EIR/EIS (SCH #2011111013).

3. Environmental Evaluation provides independent analyses of the proposed project and alternatives. To determine the environmental consequences, or impacts, for each issue area, the proposed project and its alternatives are compared to a baseline condition. Under CEQA, the difference between the proposed project/alternatives and the baseline is then compared to a threshold to determine if the difference is significant. Under NEPA, the environmental impacts of the proposed action and the alternatives are presented in comparative form based on the information and analysis presented in the sections on the affected environment (40 CFR § 1502.15) and the environmental consequences (40 CFR § 1502.16).

   One of the primary requirements of NEPA analyses is the evaluation of project alternatives at a level equal with that of the proposed project. For each environmental issue evaluated in Chapter 4, analyses are conducted for Alternative 1 and the proposed project, and the No Project/No Action Alternative. This allows for comparison of the alternatives under each resource area and facilitates the ultimate selection of an agency-preferred alternative for the Final EIR/EIS. Following the analysis, the level of significance is identified, as defined by CEQA. An impact may be deemed one of the following: no impact, less than significant impact, significant but mitigated impact, or significant and unavoidable impact (i.e., no feasible mitigation is available to reduce the project's impacts to a less than significant level). Effects considered significant under NEPA are also identified. The two conclusions may differ based on different approaches to impact determinations because NEPA is not specifically threshold-driven for most resources. This section is consistent with NEPA terminology but corresponds to Impact Analysis under CEQA.

4. Avoidance, Minimization, and Mitigation Measures identify the means by which impacts could be reduced or avoided in cases where the analysis determines such impacts to be significant under CEQA or NEPA. CEQA requires that all feasible mitigation be considered, even if it would not reduce the impact to below a level of significance. Where applicable, level of impact after application of mitigation measures is discussed and whether remaining impacts would or would not be considered significant under CEQA or NEPA.

CEQA and NEPA Baselines

As a joint FEIR/EIS, this impact analysis considers both the CEQA and NEPA baselines. CEQA requires a project to review its impacts relative to "change from existing conditions," while NEPA directs that agencies use the process to "succinctly describe the environment of the area(s) to be

affected or created by the alternatives under consideration, including the reasonably foreseeable environmental trends and planned actions in the area(s)" (40 CFR § 1502.15). Baseline conditions described in the original EIR/EIS finalized in 1991 have been updated throughout Chapter 4 to reflect current conditions using recent studies and best available information. Baseline conditions described in the previous EIR/EIS are considered outdated due to the amount of time since approval of this document from the proposed project, implementation of some of the Phase I projects, and the dynamic conditions at the estuary and along the coast. Conditions at the estuary are dynamic and the coastal littoral process is seasonally and annually variable, influenced by environmental circumstances such as tidal fluctuations and storm events. Therefore, defining the baseline for the proposed project must consider this fluctuation in "existing conditions" to provide more recent context against which impacts of the proposed action and its alternatives can be compared for both CEQA and NEPA. In accordance with Section 15125 of the CEQA Guidelines, the baseline condition under CEQA is typically defined by the physical environmental conditions in the vicinity of a project as they exist at the time of the NOP, which for TETRP II Phase I was May 27, 2021. Information on the origin and applicability of baseline conditions is included at the beginning of each issue area discussion.

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4.1 LAND USE

Land use across Tijuana Estuary and surrounding areas are considered as context. Regulatory requirements pertaining to specific topic areas, such as recreation and trails, noise, air quality, and water quality, are discussed in their respective following sections.

4.1.1 Affected Environment

Land Designations and Management Responsibilities within Tijuana Estuary

Multiple jurisdictions and entities have management responsibilities throughout Tijuana Estuary and the project site. The various federal, state, and local designations and authorities create a complex network related to land use management. Section 2.4, Planning Influences, includes a description of the following land use designations and management entities: TRNERR, the Refuge, Border Field State Park, coastal zone, City of San Diego MSCP Subarea Plan and MHPA, Tijuana River Mouth SCMA, City of Imperial Beach LCP, and City of San Diego Tijuana River Valley LCP (CCC retained jurisdiction). The majority of the project site is located within Border Field State Park boundaries, with some northern areas overlapping with the Refuge. The project site is within the overall TRNERR complex and within the coastal zone, where the Tijuana River mouth is designated as a SMCA.

Land Ownership

The TETRP II Phase I project site is located in the southern arm of Tijuana Estuary and is encompassed by TRNERR, which includes Border Field State Park and the Refuge. Overall ownership within TRNERR is detailed in Section 2.2.2 and Figure 2-4.

Existing Land Use

Surrounding Land Use

The Tijuana River Valley, which consists of developed and undeveloped lands, including commercial, residential, recreational, and agricultural uses, and open space and park land, extends inland east of the estuary. The estuary is bordered to the west by the Pacific Ocean and to the north, east, and south by Navy, commercial, and residential development in unincorporated County lands and lands within the cities of Imperial Beach and San Diego, and Tijuana, Mexico. Development around the estuary generally starts adjacent to the boundaries of the estuary and south of the international border. Development surrounding the estuary, especially to the north and northeast, is typically dense with Navy, residential, and commercial developments, and substantial transportation

infrastructure. Lands are generally undeveloped and/or rural to the south and east along Monument Road until the international border, where urban development begins within Mexico.

Areas of industrial and military uses are also close to the estuary, such as the now closed Nelson Sloan Quarry, City of San Diego South Bay Water Reclamation Plan, and South Bay International Wastewater Treatment Plant, located southeast of the estuary and project site. Additionally, NOLF IB is north of the estuary and operates as one of the largest helicopter training facilities on the West Coast.

Small agricultural operations are scattered throughout eastern portions of the river valley. Some of the remaining agricultural operations in the area are equestrian-based facilities. There are also some small nursery and row crop operations near Dairy Mart Road and Hollister Avenue.

Land Uses within Tijuana Estuary

Tijuana Estuary is a coastal wetland providing a substantial area of open space that supports sensitive biological and ecological resources. Within the estuary, the majority of TRNERR is open space, with expanses of habitat and various channels and drainages traversing the area. Public access within TRNERR is limited to specific park use areas and designated trails to provide protection of the sensitive wildlife and habitat species.

Scientific research and monitoring occur throughout TRNERR by authorization of special permit(s). These efforts are guided by the National Estuarine Research Reserve System plans that identify goals, priorities, and implementation strategies for these programs, as well as research and monitoring needs specific to TRNERR (TRNERR 2020).

The Tijuana Estuary Visitor Center was constructed in 1991 in the northern portion of the estuary with a USFWS easement provided to CSP. The Tijuana Estuary Visitor Center provides a centralized location where the public can gather information, participate in educational opportunities, and partake in general involvement within TRNERR. Through an easement with the USFWS, CSP has management responsibility for the visitor center complex that lies within the boundaries of the Refuge (TRNERR 2010).

Designated trails are located through portions of TRNERR to provide public access while protecting sensitive ecological resources. Trails in the northern portion of TRNERR are generally designated for pedestrian or pedestrian and bike-friendly uses, as shown in Figure 2-3. Trails in the central and southern portions of TRNERR are designed for equestrian use as well as pedestrian use. A corral, hitching posts, and trailer parking are provided along Monument Road to accommodate equestrian use. An unpaved extension of Monument Road known as Beach Trail generally serves as the southern boundary of the project site. Beach Trail is used by recreationists and equestrians and provides east-

west beach access. Trails traverse portions of the estuary as well as along the coastal beach areas. Horseback riding on the beach at this location is one of the few remaining places that equestrian use is allowed on southern California shorelines. Trails provide public access to viewing areas, picnic areas, and interpretive displays.

The Refuge forms the northern half of TRNERR and consists of land owned by both the USFWS and the U.S. Navy, as well as waters of the state (estuarine channels) that are leased from the State of California to the federal government for management as an NWR. The Visitor Center and surrounding complex provides a centralized location where the public can gather information, participate in educational opportunities, and partake in general involvement with the Reserve. The trail network throughout the Refuge provides opportunity for recreational hiking and biking, wildlife viewing, and shoreline access. Viewing areas, picnic areas, and interpretive displays are accessible to the public within the Refuge.

Border Field State Park in the southwestern-most corner of TRNERR provides restrooms, picnic areas, barbecues, horse corrals, interpretive displays, and scenic views across the beach and estuary. Monument Mesa is a picnic and parking area within Border Field State Park that provides scenic views in proximity to the international border. Border Monument Number 258 can be viewed from this location though there is no close access due to the border fence. The bunkers left from World War II can also be viewed. Friendship Park and the Binational Garden are publicly accessible on a limited basis.

Tijuana River Valley Regional Park is a County of San Diego day-use park located east of the project site, extending to I-5. The County of San Diego Department of Parks and Recreation manages the Tijuana River Valley Regional Park, consisting of over 1,800 acres. The regional park provides passive and active recreation including bird watching, little league baseball, hiking, biking, and horseback riding along 22.5 miles of designated trails; a bird and butterfly garden; and a community garden. A public campground, outdoor education center, and day-use facilities, located approximately 0.85 mile to the east of the project site, have recently been constructed on County of San Diego property, a portion of which extends into the Reserve near Monument Road (County of San Diego 2020).

Land Uses within the Project Site

Almost the entire acreage of the project site is open space without extensive human development or use as shown in Figure 4.1-1. Monument Road/Beach Trail provide east-west beach access for pedestrians and equestrians, as well as emergency access. Marsh Trail (pedestrian only, no dogs or bicycles) traverses a portion of the project site boundary and bisects the southern portion of the project site in a north-south manner, connecting to Beach Trail. At the northeastern end of the project site, Marsh Spur Trail is adjacent to areas planned for channel connection improvements.

Applicable Planning Documents and Regulations

Multiple planning regulations, documents, and guidance applicable to Tijuana Estuary and the project site are used by the jurisdictional authorities to guide land use and development. The most applicable planning documents are listed below:

- Coastal Zone Management Act
- National Estuarine Research Reserve System
- TRNERR and Tijuana Slough NWR Comprehensive Management Plan
- National Wildlife Refuge System Improvement Act
- California Coastal Act
  - City of Imperial Beach General Plan/Local Coastal Program Land Use Plan
  - City of San Diego Tijuana River Valley Local Coastal Program and Land Use Plan
- Marine Life Protection Act
- Border Field State Park General Development Plan
- City of San Diego MSCP and MHPA (within applicable lands such as those owned by the City of San Diego)

4.1.2 CEQA Thresholds of Significance

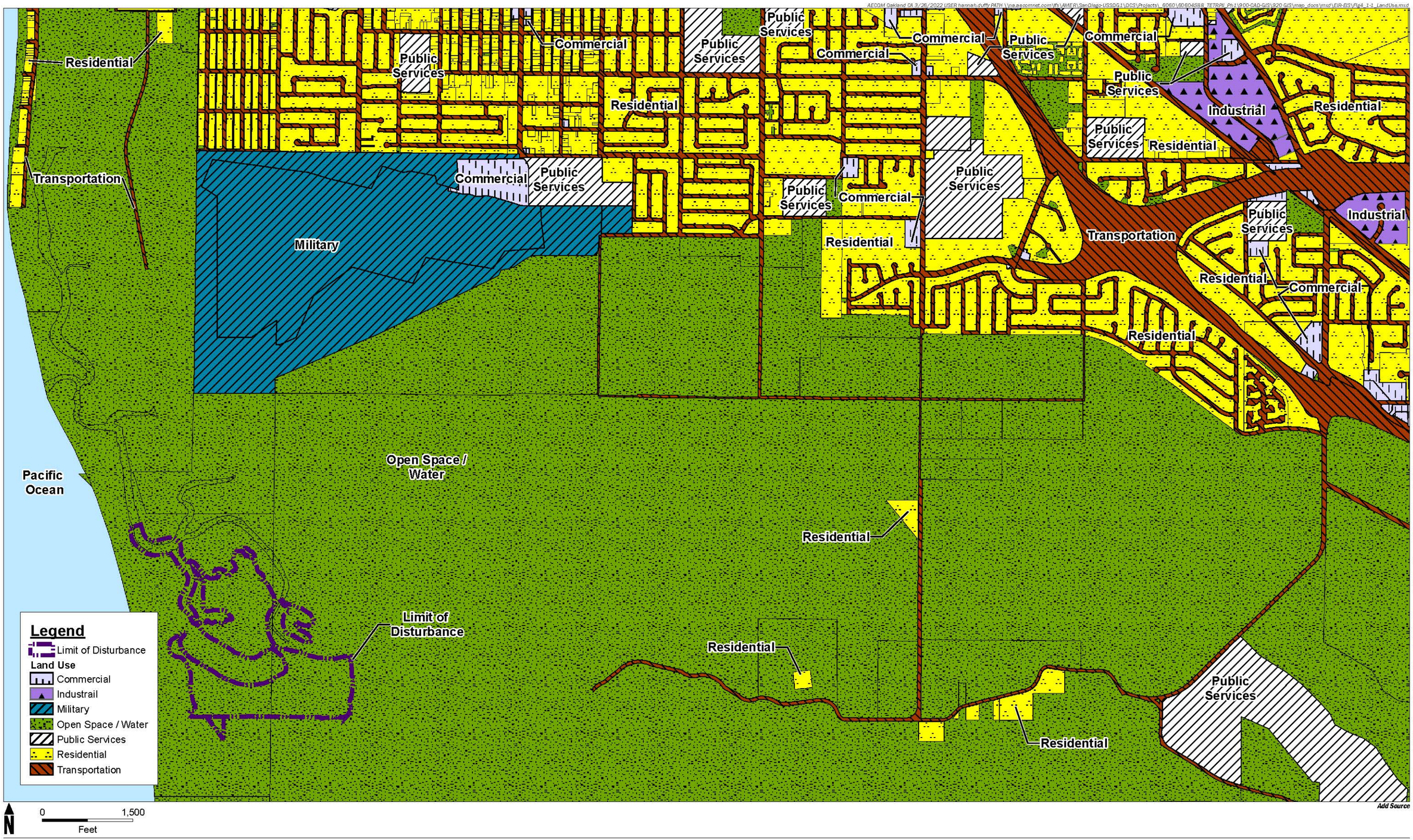
Would the project:

a) Physically divide an established community;

b) 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?

4.1.3 Environmental Evaluation

The 1991 TETRP EIR/EIS found that implementation of Model Marsh would not result in land use impacts; however, the overall restoration project could have resulted in significant impacts due to the loss of agricultural production identified at the time. TETRP II Phase I currently under evaluation in this tiered document would not result in impacts to the loss of agricultural production either directly or in the surrounding areas. The project area does not include portions that are currently in agricultural production, and restoration of the project area as proposed, including soil management, would not create indirect effects or be of the nature to cause the cessation of agricultural uses in the area (see Section 7.2.1, Agriculture for more discussion). Thus, this potential land use impact related specifically to agricultural land use identified in the 1991 TETRP EIR/EIS would not result with implementation of TETRP II Phase I.



AECOM
San Diego County, California
TETRP II Phase I EIR/EIS

FIGURE 4.1-1
LAND USES IN THE VICINITY OF THE PROJECT SITE

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4.1.3.1 Restoration/Enhancement

Alternative 1

Alternative 1 would not result in the permanent conversion of the estuary from a wetland to another land use post-restoration. The overall existing land use of the project site within the estuary would not change; it would remain a coastal wetland and protected reserve area. With restoration of the project site, the continuation of the overall estuary land uses would remain compatible with the surrounding areas and not modify land uses in nearby areas. The project site and surrounding lands would continue to provide a substantial area of open space that supports sensitive biological and ecological resources.

Construction staging and access areas shown in Figure 2-2 would be located in existing, generally disturbed areas and would primarily use existing road and trail access. At the completion of Alternative 1, the construction staging area would be restored to the original pre-construction condition or better (e.g., planted with native species) per PDF-12. This would not result in a permanent conversion of land uses.

Implementation of Alternative 1 would not result in changes or modifications to the open and natural estuary setting that would create a new barrier or physical separation of an existing community. Access to the project site is purposefully limited to protect the sensitive ecosystem and biological resources. **Thus, there would be no impact associated with the physical division of an established community under CEQA (CEQA Criterion A), and no impact pursuant to NEPA.**

The project site is identified in multiple planning documents as an area to be preserved and protected as a natural open space with goals of enhancement and restoration (see Table 4.1-1). As shown in Table 4.1-1, under Alternative 1 the overall estuary function would remain consistent with applicable objectives, goals, and policies of relevant planning documents. Many of the land use regulations applicable to the project site are geared towards the preservation and restoration of the estuary and associated resources. Alternative 1 would serve to enhance estuary function and associated flora, fauna, and other sensitive resources protected by land use regulations. While some temporary environmental impacts would result from actions necessary to implement Alternative 1, as discussed throughout the analysis sections of this FEIR/EIS, restoration consistent with Alternative 1 would not conflict with land use regulations or policies in a manner that would result in significant changes to the environment. T**hus, impacts related to a conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect would be less than significant under CEQA (CEQA Criterion B) and would not be significant pursuant to NEPA.**

Table 4.1-1
Consistency with Applicable Land Use Regulations, Plans, or Programs

Applicable Regulation, Law, Plan, or Program	Project Consistency
Coastal Zone Management Act	**Consistent:** Project activities would be regulated by the California Coastal Commission (CCC) as the project site is within areas of retained or deferred certification with permitting authority held by the CCC. Section 307(c)(1) of the Coastal Zone Management Act (CZMA) requires that federal agency activities that affect land or water use or natural resource of the coastal zone are required to be consistent with the affected state's coastal management program to the "maximum extent practicable." Section 930.32 of National Oceanic and Atmospheric Administration 's regulations implementing the CZMA (15 Code of Federal Regulations § 930) defines "consistent to the maximum extent practicable" as follows: (a)(1) The term ''consistent to the maximum extent practicable'' means fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the federal agency. Primary federal consistency determination considers consistency with the planning and management policies of Chapter 3 of the California Coastal Act (CCA). Determination of proposed project consistency with the CCA is described below in this table and more specifically in Table 4.1-2.
National Estuariane Research Reserve System	**Consistent:** Each National Estuarine Research Reserve must prepare a written Management Plan, which identifies the Reserve's short- and long-term management issues and proposed actions. TRNERR's management plan is the TRNERR Comprehensive Management Plan described below.
TRNERR Comprehensive Management Plan	**Consistent:** The TRNERR Comprehensive Management Plan specifically includes large-scale habitat restoration. Chapter 4, Section C Restoration specifically includes the TETRP as item 4 with a primary goal to restore degraded natural habitats of TRNERR and that the program is designed to increase salt marsh and intertidal mudflat habitat and restore tidal flushing. The proposed project would work towards achieving the restoration goals and objectives of the plan.
National Wildlife Refuge System (NWRS) (National Wildlife Refuge System Improvement Act 1997)	**Consistent:** The most appliacable legislation of the NWRS as it relates to this project is the conservation of fish, wildlife, and plants and their habitats within the areas of the project that affect the Tijuana Slough National Wildlife Refuge. The project, which proposes to restore or maintain habitat quality within the Refuge is consistent with this legislation.
California Coastal Act (CCA)	**Consistent:** In accordance with Section 30233 (a)(6) of the CCA, restoration activities are regulated and implemented by the CCC with retained jurisdiction authority held within the City of Imperial Beach, and deferred certification authority held by the CCC within the City of San Diego portion of the project site. A Coastal Development Permit from the CCC would be obtained by the proposed project, as required. See Table 4.1-2 for consistency dicussion specific to Chapter 3 of the CCC.
Marine Life Protection Act	**Consistent:** The Tijuana River Mouth is designated as a State Marine Conservation Area (SMCA). The permitted uses specific to the Tijuana River Mouth SMCA pursuant to California Code of Regulations Title 14 Section 632(b)(147)(C) include beach nourishment and other sediment management activities.
Border Field State Park General Development Plan	**Consistent:** The project site is within areas designated by the plan as Endangered Species Protection/Preservation Zone and Wetland/Wildlife Conservation Zone. The proposed project is consistent with management objectives of these zones to maintain a natural estuarine ecosystem that can support the endangered species dependent on this habitat, as well as maintain a relatively natural condition that can provide complementary habitat to endangered species and other estuarine wildlife.

Table 4.1-2
Coastal Act Chapter 3 Policy Consistency Summary Table

California Coastal Act	Proposed Project
ARTICLE 2 **PUBLIC ACCESS** Article 2 focuses on public access to the coast and the provision and maintenance of public access availability and opportunities.	Implementation of the proposed project would not alter or restrict public access to the coast, but one short pedestrian-only trail would be eliminated. The proposed project would not include new development of public facilities. The project site is within the protected reserve and does not include beach or shoreline access. During construction, access routes would include the use of Monument Road and beach nourishment activities may also use Beach Trail, which continues west to access the beach. As detailed in Section 4.2, Recreation and Public Access, Monument Road and Beach Trail would generally remain open to the public on weekends and holidays but may be temporarily closed during construction in order to maintain public safety. Trails would be open for use by the public post-restoration. Marsh Spur Trail would not be impacted during construction activities and would remain in place post-restoration. Marsh Trail would be eliminated with implementation of the proposed project. This 0.5-mile-long pedestrian-only trail does not provide beach access as it only makes a looping route between two other trails near the restoration site. The loss of Marsh Trail would not reduce or impede beach or shoreline access as provided by the overall trail network.
ARTICLE 3 **RECREATION** Article 3 provides protections for coastal recreation and lands that provide coastal recreation opportunities.	The proposed project does not include elements that would modify coastal recreational opportunities or access to coastal recreation opportunities. As detailed in Section 4.2, Recreation and Public Access, and above under Article 2, Marsh Trail would be removed as part of the restoration; however, this trail is pedestrian only and does not provide beach access. As described under Article 2 above, Monument Road and Beach Trail may experience temporary closures during construction to provide public safety but would generally remain open to the public for continued beach access on weekends and post-construction. Marsh Spur Trail provides recreational opportunities but does not provide beach or shoreline access within TRNERR. Construction activities would not impact Marsh Spur Trail located at the northern end of the project site, and the trail would remain open for public use once construction activities have completed. Beach nourishment and periodic river mouth excavation could result in temporary beach closures in the immediate area around an active construction area. These short-term closures in discrete locations on the beach for public safety would not preclude the continued use of the surrounding beach areas for coastal recreation. After beach nourishment, the nourished beach area would provide increased sandy beach materials to enhance the beach experience for recreationalists.
ARTICLE 4 **MARINE ENVIRONMENT** Article 4 outlines policies related to the protection of the marine environment, such as biological productivity and protection of water quality in waters, streams, and wetlands; filling or dredging; movement of sediment; and flood control.	The proposed project would support improved hydrologic function, quality of the coastal wetland habitats, and overall estuary ecological health and would not conflict with these policies.

California Coastal Act	Proposed Project
ARTICLE 5 **LAND RESOURCES** Article 5 specifically addresses environmentally sensitive habitat areas and the protection of such resources, including agricultural, archaeological, or paleontological resources.	The proposed project would result in improved habitat values and would not conflict with Article 5 policies. The continuation of coastal access and protection of land resources would not be altered or restricted in accordance with California Coastal Act requirements. As detailed in Section 7.2.1, Agriculture, agricultural and forest resources do not exist within the project site and would not be impacted by the proposed project. Section 4.8, Cultural Resources, identified potentially significant impacts to archaeological resources during restoration and enhancement activities; however, implementation of required mitigation measures would reduce project impacts to archaeological resources to less than significant. Section 4.10, Paleontological Resources, identified no potentially significant impacts.
ARTICLE 6 **DEVELOPMENT** Article 6 (Section 30251) addresses the protection of scenic resources, public assess, and coastal development.	Many of the policies contained in Article 6 do not apply to the project as there would be no development of permanent structures that could affect coastal resources, rather it would modify the estuary to restore the open and natural setting. The proposed project would not create a significant change in visual character to the scenic reserve area as described in Section 4.11, Visual Resources. As detailed in Section 4.2, the proposed project would not modify public access to the coast as the trail that would be removed with implementation does not provide beach or shoreline access. As described in the topic-specific sections throughout this document, the project would not create adverse impacts related to issues such as geologic risk, air pollution, energy consumption, or unique communities.
ARTICLE 7 **INDUSTRIAL DEVELOPMENT** Article 7 focuses on the location of coastal-dependent industrial uses.	Many of the policies contained in Article 7 do not apply to the project as there would be no development of industrial facilities, rather it would modify the estuary to restore the open and natural setting. The restoration project would not influence industrial development in the area.

Proposed Project

The proposed project is similar to Alternative 1, and restoration and other enhancement efforts that would occur under the proposed project would not alter land use effects; thus, the discussions and conclusions identified under Alternative 1 are also applicable to the proposed project. **Thus, there would be no impact associated with the physical division of an established community under CEQA (CEQA Criterion A), and no impact pursuant to NEPA.**

Under the proposed project, impacts related to a conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect would be less than significant under CEQA (CEQA Criterion B) and would not be significant pursuant to NEPA.

No Project/No Action Alternative

Under the No Project/No Action Alternative, the proposed TETRP II Phase I restoration of the estuary would not be completed. There would be no changes to existing or planned land uses within

or surrounding the project site. **Thus, there would be no impact associated with the physical division of an established community under CEQA (CEQA Criterion A), and no impact pursuant to NEPA.**

There would be no changes to the existing consistency with land use plans and policies. However, with no restoration activities or other estuary modifications, the No Project/No Action Alternative would not work to achieve the restoration and enhancement goals and objectives listed in many of the applicable planning documents. While not considered a conflict with land use policies, the resource values of the estuary would continue to decline with implementation of the No Project/No Action Alternative. **Under the No Project/No Action Alternative, impacts related to a conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect would be less than significant under CEQA (CEQA Criterion B), and there would be no impact pursuant to NEPA.**

4.1.3.2 Soil Management

Similar to restoration/enhancement, beneficial reuse of material on the adjacent beach or locations within the project site would not create a new land use condition or use, rather it would add material to the existing project area features. Additionally, placement of dredged sand on the beach south of the river mouth currently occurs as needed from excavation operations to maintain an open river mouth. Soil that may be transported off-site, such as at the Nelson Sloan Quarry, at other approved projects requiring fill, or at a local landfill, would not be of the nature to alter or change land uses or create policy conflicts. Beach nourishment, either a one-time placement of material from excavation during restoration and/or ongoing sand placements from river mouth excavations, would not cause a divide or disruption to the surrounding communities. If necessary, temporary placement of a pipeline to carry material from the site to place material would not cause a division in an existing community and would be removed at the completion of placement.

Periodic excavation of the river mouth to prevent closure would involve excavating accumulated sand and/or sediment at the mouth of the river and placing it on adjacent unvegetated beach areas or along the shoreline to either north or south of the river mouth. This occasional excavation activity within the river mouth may require short-term, temporary closures on the beach immediately surrounding the river mouth for public safety during construction activities. This occasional localized and short-term beach restriction would not divide an existing community.

Thus, beach nourishment and river mouth excavation would result in no impact associated with the physical division of an established community under CEQA (CEQA Criterion A) and would not be significant pursuant to NEPA.

Several sections of the California Coastal Act focus on shoreline construction, specifically Sections 30235, 30233, and 30706. Section 30233(b) of the California Coastal Act specifies that dredge spoils suitable for beach nourishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems. The placement of material on the beach would require the temporary restriction of public access to the immediate beach area receiving material, but would not conflict with public access policies outlined in Article 2 and Article 6 (Section 20252), or recreation policies outlined in Article 3 as access to surrounding beach areas would be maintained. Article 4 requires spoils disposal to be planned and carried out to avoid significant disruption of marine and wildlife habitats, and water circulation. As described in Section 4.6, Biological Resources, the marine environment would not be significantly impacted by beach nourishment. Beach nourishment would provide additional protection for the sensitive coastal dunes located the back of the beach along the placement site and sandy beach areas would be expanded throughout the placement site. Thus, the resulting protection of land resources would be in accordance with requirements of Chapter 3 of the California Coastal Act.

While access to active construction areas on the beach would be temporarily restricted for public safety during beach nourishment, access to surrounding beach areas would remain available and would not conflict with public access policies. Once completed, nourishment areas would have more sand to enhance the beach setting. The project would not conflict with applicable policies, environmental goals, objectives, and recommendations.

Periodic river mouth excavation that may be required to maintain the river mouth in an open condition would result in only short-term, limited access restrictions to the river mouth during excavation. Therefore, there would be no conflicts with existing planning documents as a result of this activity. Beach nourishment and other sediment management activities are a specified allowable use for the Tijuana River Mouth SMCA (CCR Title 14, Section 632 (b)(147)(C)).

Thus, impacts related to a conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect due to beach nourishment or river mouth excavation would be less than significant under CEQA (CEQA Criterion B), and no significant land use effects have been identified pursuant to NEPA.

4.1.4 Avoidance, Minimization, and Mitigation Measures

The proposed project would not result in land use impacts that are significant under CEQA or NEPA; therefore, no mitigation measures are required.

4.2 RECREATION AND PUBLIC ACCESS

This section describes existing environmental conditions related to recreation and public access in TRNERR, including the project site, river mouth, and potential beach nourishment sites. This section also identifies pertinent policies and regulations directing recreation activities in the proposed project area and evaluates the impacts associated with implementation of the proposed project.

4.2.1 Affected Environment

The natural aesthetic of the tidal marshes and wildlife of Tijuana Estuary have long attracted passive recreational users, such as birders, hikers, photographers, and nature enthusiasts. However, the ecological sensitivity of the area also requires necessary limits on the extent of public access to protect and preserve the natural setting.

Regulatory Setting

As described in Section 4.1, Land Use, multiple entities have regulatory authority within Tijuana Estuary and the project site. The following provides a brief list of those planning policies and directives that are applicable specifically to recreation and public access, many of which overlap jurisdictions.

- Tijuana River National Estuarine Research Reserve and Tijuana Slough NWR Comprehensive Management Plan
- California Coastal Act
- City of San Diego, Tijuana River Valley Local Coastal Program, Land Use Plan
- City of Imperial Beach, Local Coastal Program, Land Use Plan
- Marine Life Protection Act, Master Plan for Marine Protected Areas
- Border Field State Park General Development Plan

Public Access

Two main roads provide public vehicle access into TRNERR. At the northern end of TRNERR, Caspian Way leads to the Tijuana Estuary Visitor Center and trail system on the northern portion of Tijuana Slough NWR, and Seacoast Drive leads to the beach north of the Tijuana River Mouth. Monument Road provides access to Border Field State Park and the southern portion of Tijuana Slough NWR. The estuary can also be accessed by foot via various trailheads that start outside of the project site, especially within the Tijuana River Valley Regional Park at the eastern end of the river valley, such as North and South Beach Trail near Dairy Mart Road or Servando Trail near the Sunset Avenue parking areas.

Recreation and Public Access within Tijuana Estuary

TRNERR and the surrounding parklands offer a variety of recreational opportunities and public access to the Reserve and coastal resources. The Visitor Center offers educational programs and displays that explain the ecology of the estuary. Through an easement with the USFWS, CSP has management responsibility for the Visitor Center complex that lies within the boundaries of the Refuge within TRNERR (CSP 2010). There is an extensive trail network throughout TRNERR, including within the Refuge, and various parklands throughout the river valley; see Figure 2-3. The trail network serves a variety of recreational users including hikers, bicyclists, and equestrians as specifically designated per each trail. The designated trail network provides a way for the public to access the natural setting of the estuary as well as the coast in a manner that protects sensitive biological resources and supports interpretive programs led by TRNERR/agency staff and/or other conservation partners.

Equestrian facilities, including corrals, hitching posts, and trailer parking, are provided along Monument Road and at multiple other locations within the Tijuana River Valley Regional Park to accommodate equestrian trail use.

Border Field State Park

CSP owns and administers the 761-acre Border Field State Park located at the southern end of TRNERR. Amenities include picnic sites, restrooms, and interpretative displays, and views of the historical monument on Monument Mesa. The park is generally devoted to passive recreation such as picnicking, hiking, walking along the beach, swimming in the ocean, and horseback riding. As described under the trail network, horse-riding trails traverse through the Tijuana River Valley, into Border Field State Park via Monument Road/Beach Trail and on to the Pacific Ocean. Border Field State Park is accessed by vehicles from the east via Monument Road. Monument Road is a paved two-lane road that generally travels east-west from the eastern end of the river valley until approximately the eastern boundary of the project site where it turns south into Border Field State Park. Border Field State Park is periodically closed due to sewage spills, flooded roads and trails, or other public health and safety concerns.

Tijuana River Valley Regional Park

The County of San Diego's Tijuana River Valley Regional Park is primarily a day-use park located east of the project site, extending to I-5. The County of San Diego Department of Parks and Recreation manages the Tijuana River Valley Regional Park, consisting of over 1,800 acres. The regional park provides passive and active recreation including wildlife watching, little league baseball, hiking, biking, and horseback riding along 22.5 miles of designated trails. A public campground, outdoor education center, and day-use facilities have recently been constructed in

the western part of the valley near Monument Road, approximately 0.85 mile from the project site (County of San Diego 2020).

Recreational and Public Access Restrictions

Due to the designation as an NERR, TRNERR is a protected area established for long-term research, education, and stewardship and this requires certain restrictions to protect the ecological resources. Some restrictions include that public access is allowed only within designated trail pathways. No recreational motorized vehicles are allowed on the trails; however, some trails may be used by emergency vehicles for access purposes. No fishing is permitted within the river channel or along the Tijuana River within the Refuge boundary, and surf fishing is limited by the SMCA restrictions to only coastal pelagic species and through dip net methods. Camping is only allowed in the adjacent Tijuana River Valley Regional Park campground.

Recreation and Public Access within the Project Site

The project site provides minimal recreational opportunities. As shown in Figure 2-3, Marsh Trail travels along a portion of the southeastern boundary of the project site and then turns south through the project site, along the edge of Model Marsh. South Beach Trail and North Beach Trail converge near the southeast corner of the project site and the trail continues west to the coast (i.e., Beach Trail), parallel with the southern boundary of the project site. Public access is only allowed on these designated trails and Marsh Trail only permits pedestrian use.

Recreation near the mouth of the estuary where work would occur periodically to remove sand as needed from the river mouth, as well as locations along the shore where material may be placed for beach nourishment, is generally limited to typical beach-related recreation activities, such as sunbathing, swimming, wading, picnicking, surfing, stand-up paddle boarding, and other similar recreation. However, recreation within the Tijuana River mouth leading into the estuary is prohibited. Seacoast Trail approaches the river mouth from the north, providing pedestrian and bicycle access along the shore. Coast Trail North/South provide trail connection along the shore from south of the river mouth to the international border. This trail allows for pedestrian and equestrian use. Horseback riding on the beach at this location is one of the few remaining places that equestrian use is allowed on southern California shorelines. The beach above the high tide line north of the river mouth is partially closed during the California least tern (*Sterna antillarum browni*) and western snowy plover (*Charadrius nivosus nivosus*) nesting season. Closed areas are designated by signage and symbolic fencing placed, and sometimes relocated, in response to tides and nesting activity each season. The beach is periodically posted as closed to water contact by the San Diego County Department of Environmental Health due to sewage spills, water contamination, and other public health and safety incidents, which may require land managers to temporarily restrict public access to certain areas of the beach. No camping or fires are permitted

on the beach; when open for use, the beach is accessible from half an hour before sunrise and half an hour after sunset. Recreational fishing is allowed south of Seacoast Drive in the Pacific Ocean per 14 CCR § 632(b)(147)(B) for coastal pelagic species, except market squid, by hand-held dip net only.

4.2.2 CEQA Thresholds of Significance

Would the project:

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;

b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment; or

c) Result in temporary or permanent and critical loss of recreational use areas or conflict with recreational uses?

d) Preclude viability of recreational activities, including surfing, during construction (temporary impacts) that result in a major loss of recreational uses?

4.2.3 Environmental Evaluation

The 1991 TETRP EIR/EIS found that implementation of Model Marsh would not result in recreation impacts; however, it concluded that the overall restoration project, especially the development of tidal marsh in the southern arm, would result in significant impacts due to the elimination of several equestrian trails. Mitigation for this impact specified rerouting of equestrian and other public access trails and development of equestrian and hiking trails to maintain the greatest degree of public access possible while protecting the sensitive areas of the Reserve. Mitigation also specified that access be maintained to the beach to accommodate travel by horseback riders and hikers originating in the Tijuana River Valley, upstream of the Reserve.

TETRP II Phase I currently under evaluation in this tiered document would not contribute to the previously identified significant impact resulting from equestrian trail elimination in the 1991 TETRP EIR/EIS. As detailed below, Marsh Trail would be lost due to restoration and enhancement, but that eliminated trail does not allow equestrian use and does not provide beach or shoreline access or serve as a connector to other trails. The elimination of Marsh Trail is necessary to achieve the proposed restoration outcomes and development of a new trail alignment through the project area is not considered feasible due to the sensitive surrounding biological resources. Thus, this potential recreation impact related specifically to the loss of equestrian trails and their coastal access identified in the 1991 TETRP EIR/EIS would not result with implementation of TETRP II Phase I.

4.2.3.1 Restoration/Enhancement

Alternative 1

The restoration site has very limited recreational opportunities. While planning documents applicable to the project site and TRNERR call for public access and recreational opportunities throughout the area, there are also requirements to consider and balance recreation with protection and conservation of sensitive resources that could be affected by trails and public presence in the Reserve. For this reason, trails in the estuary are limited and most recreational opportunities have been developed along the outer edges of the estuary, near the Visitor Center, and along the coastline.

Marsh Spur Trail would generally remain open during construction, but could experience occasional closures to accommodate construction equipment. These interruptions would not occur after Alternative 1 implementation. Alternative 1 would not alter Marsh Spur Trail located adjacent to proposed channel connection improvements and would not cause or accelerate substantial deterioration of this trail, per CEQA Thresholds of Significance.

The 0.5-mile-long pedestrian-only Marsh Trail (see Figure 2-3) would require removal to achieve the desired elevations, hydrologic conditions, and habitat distribution within the project site. The elimination of this trail would be a permanent loss of a pedestrian trail as a result of Alternative 1 implementation, but the North Beach Trail to Beach Trail would continue to provide a similar trail experience. The area that currently includes Marsh Trail would be restored to salt marsh habitat and intertidal channels, habitats that do not support upland trail use. While this would be a permanent loss of a recreational facility and other recreational opportunities associated with the trail, such as wildlife viewing or photography, following restoration, these same opportunities would be provided to trail users traveling along the southern end of the North Beach Trail, as well as along the Beach Trail, as these trails would abut newly restored wetland. Additionally, the loss of this hiking only trail is not considered substantial in accordance with CEQA thresholds as the removal of the trail represents a loss of less than 2% of the total trails available throughout TRNERR and there would be approximately 21 miles of trails that would remain available throughout TRNERR and adjacent park areas, including the North Beach Trail and Beach Trail. As previously noted, the 0.5-mile-long Marsh Trail does not provide beach access, and does not serve as connector or other important element of the trail network. **Thus, the elimination of Marsh Trail would not create a condition that would substantially increase the use of other trails in the area that would accelerate their physical deterioration, and the impact would be less than significant under CEQA (CEQA Criterion A). In addition, the impact would not be significant pursuant to NEPA, as the limited change to the surrounding trail system would not disrupt access to the beach or surrounding area.**

As described above, the replacement or realignment of Marsh Trail or development of other recreational facilities or opportunities is not proposed. The placement of a trail through the newly restored areas would not be ecologically sensitive and could jeopardize the success of the restored areas and their ability to support species. **For this reason, Alternative 1 does not include or require the construction or expansion of recreational facilities with the potential to result in an adverse physical effect on the environment and the impact would be less than significant under CEQA (CEQA Criterion B) and would not be significant pursuant to NEPA.**

Within the project site, Marsh Trail is a pedestrian-only facility and does not provide or allow special trail use, such as equestrian use or provide a critical connection within the trail network. With permanent elimination of Marsh Trail, recreational trail use of these varieties would continue to be available to the public at other locations within and adjacent to TRNERR, including along North Beach Trail and the P.E.R.L. Link. Thus, the elimination of Marsh Trail due to restoration and enhancement would not cause a critical loss of recreational use areas or the viability of recreational activities, and the impact would be less than significant under CEQA (CEQA Criteria C and D) and no significant effect pursuant to NEPA would occur.

Overall, recreational enjoyment of the area may be slightly disturbed during the temporary restoration activities as recreationists in the vicinity may be able to view and/or hear construction activities. This visual and audible disruption of the area would be temporary, would cease at the end of restoration activities, and would not considerably preclude recreational uses in the area. While these effects could be considered a temporary nuisance to the recreationalists in the immediate vicinity of the restoration area, the surrounding recreational opportunities would remain available throughout construction and would not be lost or permanently impacted.

During mobilization, construction, and demobilization, Monument Road would be the main construction access from the east. Local access through areas east of the project site would also be along Hollister Street and Dairy Mart Road. The primary staging area would be located immediately south of Monument Road near the southwest corner of the project site. As shown in Figure 2-3, Monument Road currently serves as a portion of South Beach Trail alignment, which provides east-west access to the beach and is a multiuse trail that includes equestrian use. Dairy Mart Road also serves as an eastern segment of South Beach Trail. A short segment of Hollister Street is part of the North Beach Trail alignment and also provides access to a horse staging area. Both North and South Beach Trails serve as primary east-west trail alignments through the river valley and provide eventual connection to beach access.

While these local streets currently accommodate both street vehicle (e.g., automobiles, trucks) use and recreational trail use, the addition of large construction vehicles and increased traffic due to construction activities associated with the proposed restoration may create an increased safety hazard for recreational trail users. To minimize impacts to trail users, construction would be

scheduled during weekdays to the extent feasible. However, while construction equipment is operating in the area, closures of a portion of Monument Road within Border Field State Park are anticipated while active construction is ongoing. Alternative access for trail users traveling from the east to access Monument Mesa and the beach would continue to be available via the P.E.R.L. Link, Goat Canyon Trail, Coastal Scrub Trail, and the western segment of Monument Road. In addition, trails in the immediate vicinity of the project site, including Beach Trail and portions of North and South Beach Trails, could also experience temporary closures, as needed to ensure public safety. Other trails in the project vicinity would remain open, including the P.E.R.L. Link, which connects to the eastern portions of both North Beach Trail and South Beach Trail.

Trails in the vicinity of the project area, with the exception of Marsh Trail, are expected to remain open and available during most weekends when trails and the beach are more often used by recreationalists. Recreationalists would be able to use other trails and alternative routes during periods of temporary closure, and beach access would be maintained north (via Seacoast Trail) and south (via Monument Road and Coast Trails North/South) of the river mouth. Equestrian trail access to the beach would also continue to be viable during trail closures via alternative routes such as Coastal Scrub Trail, connecting to Monument Road, and then to Coastal Trail South.

Temporary closures would cease once construction activities are complete, and use of the trails (with the exception of the eliminated Marsh Trail) would remain unchanged post-restoration. A PDF has been incorporated into Alternative 1 to enhance public safety and reduce trail-users' potential inconvenience and nuisance that may result from temporary trail closures. PDF-1 requires signage to be placed at key locations such as the Visitor Center, horse staging areas, and parking lots to inform the public of temporary construction vehicle use along trail routes and potential trail closures. For public safety, the perimeter of the staging area to the south of Beach Trail would be temporarily fenced to restrict public access as part of standard construction practices included in Table 3-9. With implementation of this PDF and standard construction practices, the trails would remain available for use, when possible, and access to other trails in the areas and provision of beach access via alternative routes would not be restricted or limited. **Thus, use of local roadways for construction access that also serve as trail alignments would not cause increased use of other recreational facilities or necessitate a need for expanded recreational facilities (CEQA Criteria A and B) nor cause a critical loss of recreational use areas or the viability of recreational activities (CEQA Criteria C and D), and the impact would be less than significant under CEQA and no significant effects pursuant to NEPA would occur.**

Proposed Project

The proposed project would also remove Marsh Trail and the same access routes would be used for implementation of this alternative. Marsh Spur Trail would not be altered or impacted during construction activities, and would remain open for recreational uses post-restoration. Temporary

trail closures as described for Alternative 1 would be the same for the proposed project. The proposed project would also require the same PDF-1 and standard construction practices as included for Alternative 1. Therefore, the analysis presented under Alternative 1 would be applicable to the proposed project. **Thus, implementation of the proposed project would not cause increased use of other recreational facilities or necessitate a need for expanded recreational facilities (CEQA Criteria A and B) nor cause a critical loss of recreational use areas or the viability of recreational activities (CEQA Criteria C and D). Impacts pursuant to CEQA would be less than significant. No significant effects pursuant to NEPA would occur.**

No Project/No Action Alternative

Under the No Project/No Action Alternative, the proposed restoration of the estuary would not be completed. No construction activities would occur to remove soil or vegetation or make channel improvements. Marsh Trail would remain unmodified in its current configuration and construction access along trail alignments would not be necessary. Temporary trail closures would not be necessary. **Thus, there would be no impact associated with an increased use of other recreational facilities or necessitate a need for expanded recreational facilities (CEQA Criteria A and B) nor cause a critical loss of recreational use areas or the viability of recreational activities (CEQA Criteria C and D) under CEQA, and no significant effects pursuant to NEPA have been identified.**

4.2.3.2 Soil Management

Based on sediment characteristics, material removed during restoration and periodic excavation of material from the river mouth would be placed on the beach and swash zone or disposed of off-site at nearby approved project sites and/or the landfill, as appropriate. Transport of material from the project site to the beach would occur via trucking on the existing Beach Trail (western extent of Monument Road) and/or a pipeline system with dredged material to minimize new areas of disturbance.

Potential trail closures due to transportation of materials to the beach are evaluated under Alternative 1 and the proposed project in Section 4.2.3.1 above. During beach nourishment operations on the beach or in the swash zone, temporary beach closures would occur in the area immediately surrounding the placement activity. Temporary closure around the river mouth may also be necessary during excavations. Due to public safety concerns associated with heavy equipment operations on the beach (i.e., pipelines and dozers to distribute sand on the beaches), portions of the placement site would be closed temporarily to the public during construction (PDF-2) and closures would shift as activities move along the shoreline. If necessary, as a standard construction practice, equipment storage on or near the beach would also be temporarily fenced

for public safety (Table 3-9). These restrictions would result in a temporary redistribution of beach activities to adjacent areas.

Depending on the bacterial content of material excavated from the restoration site, there is the potential for water quality impacts during beach nourishment activities (discussed in Section 4.3) that could result in closure of the beach for water-contact activities. Soil testing would occur prior to placement, and PDF-14 would require water quality testing in compliance with the RWQCB 401 Certification to be issued for the permit, which would identify exceedances of standards, and require implementation of operational controls or halting beach nourishment, as necessary. The existing testing program in place would also identify water quality exceedances that may require temporary closure of water-based recreational activities along the beach.

While beach nourishment would require temporary closure of limited stretches of beach in the immediate vicinity of the construction activities for safety purposes, public access points to the local beaches outside of the active construction areas would not be restricted. Pipeline segments crossing the beach would be buried or covered at consistent intervals to facilitate access from the back beach to the water (PDF-3). As sand placement activities shift along the beach, those areas in which sand placement has been completed would be reopened to public use. Per PDF-16, during beach nourishment horizontal access would be maintained to the extent feasible along the back beach where adjacent vertical access is not available. Once completed, the affected beach area would be reopened to the public and have an increased sand volume for recreational beach enjoyment. In the event of closure of the beach to water-based recreational activities due to water quality exceedances, equestrian use could continue. Beaches in the vicinity of the estuary (particularly to the north of the river mouth) have been recipients of beach nourishment in the past as part of the 2001 and 2012 Regional Beach Sand Projects (RBSPs), current periodic river mouth excavation activities, or other beach nourishment programs. The area also is also currently subject to closures due to water quality contamination, and a short-term beach area closure is not uncommon to these locations. Therefore, the temporary closure of a beach area during nourishment or periodic removal of material from the river mouth, or short-term closures due to water quality exceedance, would not result in a critical loss of recreational use or conflict as similar beach use is available in the surrounding areas and beach recreation would be enhanced. **Thus, soil management activities would not cause an increased use of other recreational facilities or necessitate a need for expanded recreational facilities (CEQA Criteria A and B) nor cause a critical loss of recreational use areas or the viability of recreational activities (CEQA Criteria C and D). Impacts would be less than significant pursuant to CEQA. No significant impacts have been identified pursuant to NEPA.**

4.2.4 Avoidance, Minimization, and Mitigation Measures

The proposed project would not result in recreation impacts that are significant under CEQA or NEPA; therefore, no mitigation measures are required.

4.3 HYDROLOGY AND WATER QUALITY

Information in this section is largely derived from studies completed for this restoration effort, including the Tidal Hydraulics and Fluvial Flooding Modeling Report (Anchor QEA 2021b), Feasibility Study (Tierra Environmental Services 2008), and the 1991 EIR/EIS (ENTRIX 1991). Water quality within the estuary during restoration, as well as water quality in the ocean during soil management activities, is addressed within this section.

4.3.1 Affected Environment

Regulatory Setting

The following laws, regulations, policies, and plans are applicable to this resource area:

- 1972 Clean Water Act (CWA)
- Federal Antidegradation Policy
- Executive Order (EO) 11988 – Floodplain Management
- No-Rise Certification or approval of Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR), as applicable
- National Flood Insurance Act
- California Ocean Plan
- Construction General Permit
- Porter-Cologne Water Quality Control Act
- State Antidegradation Policy
- San Diego Municipal Storm Water Permit
- San Diego Regional Water Quality Control Board (RWQCB) Basin Plan

Tijuana Estuary Study Area

The Tijuana River is formed by the confluence of Rio de las Palmas and Rio Alamar in Mexico, then flows northwesterly for 17 miles until eventually discharging into the Pacific Ocean. The river drains about 1,700 square miles and three reservoirs (i.e., Morena and Barrett Reservoirs within the United States with combined capacity of 96,000 acre-feet and Rodriguez Dam in Mexico with capacity of 110,000 acre-feet) regulate 71% of the total drainage area. Channel flows beyond the dams and throughout the watershed travel natural and human-modified landscapes before reaching Tijuana Estuary and subsequently the Pacific Ocean. Throughout most of Tijuana, the river flows through a concrete channel where it enters an energy dissipater system immediately upon entry to the United States before reaching the estuary.

Tijuana Estuary is a dynamic system subject to natural fluctuations in rainfall, river hydrology, erosion, sedimentation, sea level, wave action, and physical modifications mentioned above. Combined, these natural influences along with anthropogenic effects have altered watershed function and result in a dynamic river channel system. Abnormal perennial flows in the lower Tijuana River have been attributed to leakage from Rodriguez Reservoir as well as sewage spills that entered the estuary primarily from north-trending tributary canyons like Goat Canyon and Smuggler's Gulch. Over the past several decades, uncontrolled development in Mexico has resulted in destabilization of highly erodible soils particularly in Goat Canyon, which is influenced by Goat Canyon Creek. Sedimentation in the south end of the estuary has degraded existing habitat values, has encouraged exotic species colonization, and has filled estuarine channels further reducing tidal influence.

Historical evidence suggests that where the Tijuana River entered the Pacific Ocean, there was a mosaic of sandy beaches and dunes and estuarine wetlands such as salt marshes, mudflats, and seasonally flooded salt flats (Safran *et al.* 2017). Sediment accumulation and changes in the hydrology of the Tijuana River and other factors have led to major shifts in habitat types within the estuary (e.g., from unvegetated intertidal flats to vegetated salt marsh) (Safran *et al.* 2017). While tidal salt marsh areas in the north are comparatively similar to today's conditions, extensive salt marsh has been lost within the southern arm with extensive conversion of wetland to upland habitat types. In 1852, the tidal prism was calculated to be 1,550 acre-feet (ENTRIX 1991). It's estimated that as much as 60–80% of wetland habitats and tidal prism at Tijuana Estuary have been lost since the mid-1800s.

Groundwater Aquifer Recharge

The Tijuana Groundwater Basin underlies the portion of the Tijuana River Valley that lies within California (DWR 2006). Recharge to the basin mainly occurs from the Tijuana River and controlled releases from the Barrett, Morena, and Rodriguez reservoirs but can also vary naturally depending on streamflow and accumulated rainfall, and between wet and dry seasons. The groundwater storage capacity is about 50,000 to 80,000 acre-feet (DWR 2006). The water table has fluctuated dramatically over time, with lows in the mid-20th century due to extensive extraction and subsequent recovery with declining agriculture in the valley in recent decades (Safran *et al.* 2017). Within the project area, groundwater salinities can also vary greatly, from 1–2 parts per thousand (ppt) in 1986–1987 (C. Nordby, unpublished data) to 38 ppt in 2002 (Tierra Environmental Services 2002).

Drainage/Circulation and Surface Runoff

The hydrologic water balance and the circulation dynamics of the estuary are dependent on the surrounding landform topography and the estuary bathymetry, as well as conditions that vary seasonally relative to the following:

- Precipitation (watershed drainage and direct rainfall to the estuary);
- Tidal prism (the total volume of water exchanging between the ocean and estuary during ebb and flood tides);
- Groundwater level and groundwater/surface flow relationships (e.g., groundwater mounding or springs and seepage);
- Dry weather runoff;
- Evaporative water loss due to combinations of temperature, humidity, and wind; and
- Aquatic and wetland plant transpiration water loss.

Tijuana Estuary is fed by two main hydrologic forces; the Tijuana River (fluvial) and the ocean/tidal inlet (littoral). As mentioned above, fluvial flows are influenced by both naturally occurring processes and alterations made to the course of the river such as channelized flows, treated effluent discharged into the river during both dry and wet weather flows, upstream dams and modifications that control flows through the Tijuana River, and changing land use (e.g., increasing hardscape). Streamflow conditions within the Tijuana River can vary dramatically. Based on river gauge data from 1937–2010, flows during wet years are over 600 times greater than flows during dry years. For example, during El Niño conditions, there is a 23% probability of annual peak flows exceeding 10,000 cubic feet per second (cfs) but only a 7% chance during non-El Niño years. Daily discharges can exceed 25,000 cfs during extreme flow events (Safran *et al.* 2017).

Water levels in the estuary fluctuate with the tidal cycle, and the estuary is normally flushed by mixed tides twice daily. Tidal circulation in the estuary is limited by the shallow depth of the river mouth/inlet channel and low hydraulic efficiency of tributary slough channels. Consequently, the actual tidal prism is considerably less than the potential tidal prism, or the volume calculated from measurements of topography. The actual tidal prism is currently estimated at 8.2 million cubic feet (Anchor QEA 2021b). Increased sedimentation, particularly within the southern arm of the estuary, has contributed to a loss of tidal prism, as channels and marsh plain have been filled with sediment, particularly from Goat Canyon and other sources. Additionally, historical landward movement of the barrier beach has contributed to reducing the tidal prism of the estuary as sand washing over the beach has filled sloughs and channels and constricted tidal flows. Since the scouring force of the tidal currents has been substantially lessened for the reasons described above, the mouth of the estuary is now susceptible to closure and slough channels are generally narrower and shallower.

The mouth of the Tijuana River, under historical conditions, was perennially open to the sea (Safran *et al.* 2017). It's now susceptible to closure due to the present reduced condition of the estuarine tidal prism and placement of imported, native sand on the beach north of the river mouth within the nearshore littoral transport cell (USFWS 2017). As such, closures have occurred in 2010 and four times throughout 2016–2017. Closure of the river mouth leads to severely degraded water quality as sewage laden influxes of freshwater can lead to hypoxic conditions in the estuary causing a fish and benthic invertebrate die-off (USFWS 2017). To resolve this issue, USFWS has been conducting periodic excavation of material from the river mouth as discussed in Section 3.3.2. These management activities consist of dredging sand that is clogging the river mouth and placing materials on the beach but at distances from and elevations above where it is unlikely for it to be transported back into the river mouth in the near term. These river mouth management activities allow for natural tidal scour to do the work of maintaining the opening. The conditions that caused these river mouth closures are expected to continue into the near future. Decades of excessive sedimentation from the watershed have substantially reduced the tidal prism of the estuary, and upstream urban development has substantially altered the flood dynamics of the watershed. These forces have therefore hindered the estuary's ability to maintain an open river mouth (USFWS 2017).

Floodplain

Tijuana Estuary is directly connected to the large river floodplain within the eastern end of the Tijuana River Valley, the majority of which is within the estimated 25-year and 100-year floodplains (TRNERR 2014). The floodplain is a mix of natural habitats along with agricultural fields, equestrian facilities, rural housing, areas of disturbed dumping, off-road activities, grading and recontouring (berming), and the effects of flooding (TRNERR 2014). Development within the watershed and Tijuana River Valley over the past 100 years has substantially altered the hydrology of the river, making flood control a major issue.

Floods in the Tijuana River are infrequent and brief but often intense, carrying high volumes of sediment. Flooding affects most of the low-lying areas within the river valley, creating potential problems, both in terms of flood inundation and riverine scour. Flow velocities are substantially affected by bridges, road crossings, and existing berms within the floodplain. As a result of major flooding in the 1980s and 1990s, berms were constructed within the floodplain to redirect floodwaters away from existing infrastructure (RWQCB 2010). In some instances, construction of berms has reduced channel capacity and may be responsible for an increase in upstream flooding (RWQCB 2010). Depending on flow, areas located behind the berms may experience minor flow or may be under water during extreme flooding event.

The USIBWC along with the County and City of San Diego are responsible for flood control within the Tijuana River Valley; with these dynamic and often destructive events, management

challenges have arisen for the federal and local agencies (RWQCB 2010). Based on the current channel configuration and condition, an approximately 5-to 10-year flood, representing a flow of between 7,000 and 14,000 cfs, can cause localized flooding along Monument Road and Hollister Street, and on private and leased properties in the Tijuana River Valley (RWQCB 2010). During these flooding events, vehicular access in and out of the valley is limited, residences and other infrastructure are impacted, and border protection operations can be impeded. Closure along Beach Trail west of Monument Road also occasionally occurs due to flooding under various storm events and flow conditions.

Inundation by Seiche, Tsunami, or Mudflow

The interior of the estuary along its western edge is currently protected from high wave energy along the beaches during the majority of beach conditions. However, during the winters of 1982–1983 and 1988–1989, storm waves washed over the beach and pushed dune sand into the estuarine channels (TRNERR 2010).

Seiches are oscillations generated in enclosed bodies of water usually as a result of earthquake-related ground shaking. A seiche wave has the potential to overflow the sides of a containing basin to inundate adjacent or downstream areas. Seiches can also occur in conjunction with a tsunami event. There is no historical precedent for large damaging seiches in the San Diego region.

Tsunamis are large ocean waves caused by sudden displacement of water that results from an underwater earthquake, landslide, or volcanic eruption. These tidal phenomena affect low-lying areas along the coastline. Seismic conditions and fault zones within the San Diego region are discussed in Section 4.7, Geology/Soils. The California Emergency Management Agency provides detailed maps showing the areas of inundation from tsunamis for the San Diego region that are used to determine whether a project footprint lies within the maximum potential limits of inundation. The western section of the estuary is currently mapped within the tsunami inundation area, including the entirety of the restoration and enhancement areas (California Emergency Management Agency 2021). The majority of the haul routes are located outside the tsunami inundation area (California Emergency Management Agency 2021).

Mudflows are shallow water-saturated landslides that travel rapidly down slopes carrying rocks, brush, and other debris. Mudflows typically occur in areas containing slopes composed of high clay-bearing soils and are often triggered by unusually heavy rains that cause the slopes to fail and mud, water, and debris to flow like a flood.

Water Quality Characteristics

Deteriorated water quality represents a substantial problem for Tijuana Estuary, particularly within the river channel and along the beach, and has necessitated periodic closures for public health and safety (TRNERR 2010). Sewage flows from Mexico provide the main pollution source. Construction of the South Bay International Wastewater Treatment Plant (SBIWTP) in the late 1990s has helped to alleviate some of the effluent discharge into the United States as the capacity of the plant (25 million gallons per day) can typically treat dry weather flows (TRNERR 2010). However, during rain events or infrastructure failures, the capacity of the plant is exceeded, and sewage (raw and partially treated) flows through the river and into the Tijuana River Valley. Tijuana Estuary is listed as a CWA 303 (d) waterbody impaired by parameters including indicator bacteria, lead, low dissolved oxygen, eutrophic, nickel, pesticides, thallium, toxicity, trash, and turbidity (CCC 2019).

The USIBWC does extensive testing of the influent to the SBIWTP to gather characteristics of the untreated wastewater from Tijuana (USIBWC 2020). Wastewater enters the Tijuana River from bypasses due to infrastructure challenges and sanitary sewer overflows as well as from Stewart's Drain, Silva Drain, Canyon del Sol, Goat Canyon, and Smuggler's Gulch from bypasses, sanitary sewer overflows, and infrastructure failures (USIBWC 2020). Sampling locations are primarily within canyons and drains upstream of the estuary with one sampling location at the river mouth. For the majority of the monitoring sites, parameters that exhibited high values were ammonia, biochemical oxygen demand (BOD), chemical oxygen demand (COD), fats, oils, and greases, phosphorous, nitrates, surfactants, and bacteria in samples taken throughout 2018–2019. Cholera was absent for all but one sampling event, and norovirus and enteric virus were present in water samples as well. The presence of these parameters are indicative of untreated wastewater entering the system. Metals present at levels of concern are copper, nickel, and zinc. Organics and pesticides were also analyzed with just a few parameters detected and with most concentrations very low and of no concern. Of these, it is noteworthy that there was no presence of pesticides of concern such as Dichlorodiphenyltrichloroethane (DDT) and Aldrin in the water samples collected.

Since water quality sampling results at the river mouth (termed the River Mouth sampling station) are most representative of water quality at the project site, results from monitoring at this station are included in table below (USIBWC 2020). Detailed soil collection and analysis occurred within the project site in March 2021 in support of the proposed project; results of this effort are summarized in Table 4.3-1 (Bodhi 2021).

Table 4.3-1
Water Quality Monitoring Results at the Tijuana River Mouth Station

Parameter	Limits[1]	Measurement
Ammonia (as Nitrogen)	Tijuana River Water Quality Objectives (WQOs): 0.025 parts per million (ppm) Ocean Plan: 6 ppm	Averages 6 ppm
Biochemical oxygen demand	Tijuana River WQOs: 10 ppm Ocean Plan: no set limit	Averages 10 ppm
Phosphorous	Tijuana River WQOs: 0.05 ppm for rivers and streams Ocean Plan: 0.1 ppm	Averages 1.5 ppm
Pathogens[3]	Tijuana River WQOs: E. coli 126 colony forming units (CFU); Enterococcus 151 CFU; Total coliform 1,000 CFU Ocean Plan: no set limits for E. coli; Enterococcus 104 CFU; Total coliform 10,000 CFU	E. coli: 24,000 CFU Enterococcus: 7,000 CFU Total coliform: > 240,000 CFU
Salinity	No set limits	Averages 20,000 ppm[2]
Bis (2-ethylhexyl) Phthalate	Tijuana River WQOs: 4 parts per billion (ppb) Ocean Plan: 3.5 ppb	Averages 3 to 5 ppb
Metals	Freshwater limits: Copper 7.5 ppb; Nickel 653 ppb; Zinc 54 ppb Ocean limits: Copper 30 ppb; Nickel 50 ppb; Zinc 200 ppb	Copper: 35.5 ppb Nickel: 21.3 ppb Zinc was not detected at the river mouth.

[1] Limits set by California's WQOs (RWQCB 2012) and the California Ocean Plan (California EPA 2005). Limits shown do not include those set by Mexican regulatory requirements.
[2] California's WQOs do not have set limits on salts in the Tijuana River given the river is not a used as a drinking water source. High salinity levels were recorded at the river mouth due to the influences of the Pacific Ocean.
[3] These results are from one sampling event in May 2019 and do not represent average concentrations of these parameters at the Tijuana River Mouth Station.

Beach Nourishment Area

Tijuana Estuary is influenced by ocean and coastal processes from the Pacific Ocean primarily through the river mouth that breaches the barrier beach located west of the estuary. The river mouth and estuary expanse remain relatively unconstrained unlike other lagoons to the north that are crossed by I-5 and Coast Highway 101, and by the railroad trestle. Coastal processes that drive beach conditions within the project site are generally common to the proposed onshore and swash zone sand placement areas. The barrier beach adjacent to the estuary is primarily sandy with fronting barrier dunes that include vegetation along the crest.

Review of the historical morphology of the estuary suggests that the estuary has been steadily decreasing in size as the landward migration of the barrier beach and encroachment of the river delta occur. More detailed information describing sediment movement and coastal processes are discussed within the following Section 4.4, Coastal Processes.

Water Quality Characteristics

Water quality at the placement site is influenced by fluvial flows, as described above, and periodic onshore littoral transport from other sources south of the international border. The beach nourishment site currently experiences water quality issues including turbidity and bacteria exceedances due to watershed flows upstream, as noted in Table 4.3-1.

With respect to turbidity, although discharges are variable, the Tijuana River has been estimated to discharge approximately 90,000 cubic meters, or over 117 thousand cubic yards (kcy), of suspended sediment to the Pacific Ocean each year. Approximately 77% of that material (91 kcy) is fine grained (Warrick *et al.* 2012). Deltares (2016) identified river sediment plumes from natural storm events as spreading the fine sediments delivered to the ocean prior to settling completely, potentially due to the freshwater carrying the sediment extending over the higher density saline ocean water as flows enter the ocean. After the sediment spreads from the river mouth, currents and waves become dominant factors in dispersing sediment in the area.

In addition to sediment, potential contaminants exit the estuary through the river mouth where they mix with the Pacific Ocean. As summarized in Table 4.3-1, ocean water at the river mouth is currently characterized by contamination, including levels of enterococcus and total coliform that exceed Ocean Plan standards (California EPA 2005). Nearshore water quality monitoring began in July 1999, and weekly (or more frequent) monitoring now occurs (Heal the Bay 2021). Annual Beach Report Cards prepared as a result of this monitoring historically indicated typically good water quality conditions on the shoreline adjacent to Tijuana Estuary during dry summer months, but very poor water quality during the winter and wet weather. Over the most recent years, however, this trend has shifted, and water quality exceedance has resulted in regular beach closures even during dry summer months because upstream discharges of untreated or partially treated water from Mexico are released into the ocean on a regular basis (Heal the Bay 2021). Additionally, sewage infrastructure failures can lead to poor water quality during the dry season, with extended periods of beach closure throughout the area (such as occurred during 2020–2021). South swell and longshore currents can also push sewage-contaminated water northward from the Punta Bandera outfall in Mexico (Southern California Coastal Ocean Observing System 2021).

4.3.2 CEQA Thresholds of Significance

Would the project:

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 that would:

i) result in a substantial erosion or siltation on- or off-site;

ii) substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site;

iii) create or contribute runoff water that 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?

4.3.3 Environmental Evaluation

The 1991 TETRP EIR/EIS found that implementation of Model Marsh would not result in hydrology or water quality impacts, and concluded that the Model Marsh project would benefit surface water hydrology by increasing the tidal volume, which would decrease periods of river mouth closures. Additionally, benefits to water quality included increased tidal flushing to help maintain proper salinity in the estuary. Conversely, the 1991 EIR/EIS concluded that the overall restoration project (495-acre project) could result in potentially significant impact to both of these resource areas. The potentially significant impact in water surface elevation was identified as a result of constructing the proposed river training structure. TETRP II Phase I currently under evaluation in this tiered document is not proposing to construct such a structure. Thus, the potential hydrology impact identified in the 1991 EIR/EIS would not result with implementation of TETRP II Phase I.

The 1991 EIR/EIS concluded that, as a result of the overall restoration project, seawater intrusion could increase surface and groundwater salinity particularly in the eastern end of TRNERR. The increase of salinity levels in the eastern end of TRNERR could result in indirect impacts from the loss of riparian habitat potentially used by the endangered least Bell's vireo. The 1991 EIR/EIS proposed mitigation for these impacts; however, because TETRP II Phase I currently under evaluation in this tiered document is not proposing to alter hydrology within existing riparian areas and, as part of design refinements, riparian habitat located to the east of the project site was specifically avoided to occupied least Bell's vireo habitat, mitigation proposed within the 1991 EIR/EIS is not applicable. Thus, the potential indirect water quality impact identified in the 1991 EIR/EIS would not result with implementation of TETRP II Phase I.

4.3.3.1 Restoration/Enhancement

Alternative 1

Construction activities associated with Alternative 1 have the potential to impact water quality through the release of sediment and pollutants such as soil stabilization residues, oil and grease, and trash and debris. Soil disturbance would expose soil to erosion from wind and water that could result in sedimentation to receiving surface waters. Increased turbidity could occur during construction activities in or adjacent to the water (i.e., dredging). Additionally, pollutants such as excessive nutrients, metals, and pesticides that become entrained within the water column as a result of sedimentation could increase the potential for eutrophic conditions to develop within the estuary.

As a standard construction practice (Table 3-9), Alternative 1 would be required to comply with applicable water quality regulations (e.g., Municipal Permit, Construction General Permit) to minimize pollutant transport during construction activities. A project Storm Water Pollution Prevention Plan (SWPPP) would be required and would identify Best Management Practices (BMPs) that would be used to protect water quality, minimize erosion and pollutant discharge, and avoid sediment transport during construction. In addition, specific BMPs may also be incorporated as conditions of the 401 Permit process with the RWQCB to manage turbidity and other indicators discussed above during construction because the estuary has been 303(d) listed for such constituents. Through development and implementation of the SWPPP, BMPs would provide protection of estuary waters. BMPs, such as silt curtains, would be implemented during excavation to control turbidity and sedimentation within the water column. Erosion- and sediment-control BMPs, such as fiber rolls, silt fences, gravel bag barriers, hydraulic mulch, soil binders, and stabilized access roads and construction entrances, would also be implemented during construction activities to minimize sediment disturbance and erosion potential. Additionally, as noted in the construction approach, the majority of grading would occur prior to connecting the restoration area to existing channels, reducing the potential for turbidity and sedimentation within the grading footprint. Design and implementation of Alternative 1 would not conflict with implementation of a water quality control plan or sustainable groundwater management plan, and temporary impacts resulting from construction activities would be controlled by the implementation of BMPs and the requirement of a project SWPPP.

Since Tijuana Estuary is listed as impaired by bacteria, lead, low dissolved oxygen, eutrophic, nickel, pesticides, thallium, toxicity, trash, and turbidity (CWA Section 303[d]), BMPs would target construction-related sources of nutrients and bacteria, while also minimizing the effects of sediment disturbance (e.g., erosion). Table 4.3-2 provides a list of typical BMPs that would be implemented during construction activities. Although Tijuana Estuary is currently listed as a

303(d) waterbody, temporary construction activities would not considerably worsen listed indicators currently identified due to the implementation of BMPs and the construction approach.

Table 4.3-2
Potential Construction-Phase Best Management Practices (BMPs)

Type of BMP	Description and Purpose
Turbidity Control	Temporary Dikes: Help to minimize the impact of dredge-related turbidity within a localized work area. Implementation would depend on contractor preference. Used for short-term control as tidal conditions allow.
Turbidity Control	Silt Curtains: Allow suspended sediment to settle out of the water column in a controlled area, to minimize the area affected by potential increased suspended sediment within the water column. Silt curtains are an impermeable barrier constructed of a flexible reinforced thermoplastic material. Provide similar temporary turbidity control where tidal surge is minimal. If used, silt curtains would likely be most effective in smaller tributary channels far from the river mouth (i.e., higher in the watershed).
Turbidity Control	Filtration Device (gunderbooms): Allows water to flow through the curtain while filtering suspended dredged sediment from the flow. Gunderbooms extend from the water surface to the bottom. Gunderbooms are permeable geotextile fabrics.
Sediment Control	Silt Fence: Detains sediment-laden water, promoting sedimentation behind the fence. Suitable for use at edge of disturbance areas; around temporary stockpiles; along the perimeter of a site; below areas where sheet flows discharge from the site; below the toe or downslope of exposed and erodible slopes.
Sediment Control	Fiber Rolls: Intercept runoff, reduce flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff (through sedimentation). Suitable for use along the perimeter of a site; downslope of exposed soil areas; around temporary stockpiles.
Sediment Control	Gravel Bag Berm/Straw Bale Barrier: Intercepts and ponds sheet flow runoff, allowing sediment to settle out. Suitable for use along the perimeter of a site; below the toe of slopes and erodible slopes; downslope of exposed soil areas; around temporary stockpiles; at the top of slopes to divert runoff away from disturbed slopes.
Sediment Control	Biofilter Bags: Detain flow and allow a slow rate of discharge through the wood media; remove suspended sediment through gravity settling of the detained water and filtration within the bag. Suitable for use along the perimeter of disturbed sites; around temporary stockpiles; below the toe of slopes and erodible slopes; downslope of exposed soil areas.
Erosion Control	Hydraulic Mulch: Sprayed onto soil surface at disposal site to provide a layer of temporary protection from wind and water erosion. Suitable for disturbed areas that require temporary stabilization to minimize erosion or prevent sediment discharges until permanent vegetation is established. Can be applied in combination with seeding/planting efforts.
Erosion Control	Soil Binders: Soil stabilizer applied to the soil surface to temporarily prevent water- and wind-induced erosion of exposed soils. Suitable for disturbed areas requiring temporary erosion and sedimentation protection until permanent vegetation is established. Can be applied in combination with seeding/planting efforts.
Erosion Control	Straw/Wood Mulch: Reduces erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff. Suitable for disturbed areas requiring temporary erosion and sedimentation protection until permanent vegetation is established. Can be applied in combination with seeding/planting efforts.

Type of BMP	Description and Purpose
Erosion Control	Hydroseeding: Seed applied to soil surface to temporarily protect exposed soils from water and wind erosion. Suitable for disturbed areas requiring temporary erosion and sedimentation protection until permanent vegetation is established. Can be used to apply permanent stabilization. Hydraulic seed should be applied with hydraulic/straw mulch for adequate erosion control.
Materials Management	Spill Prevention and Control: Prevent or reduce the discharge of pollutants to watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, and properly disposing of spill materials. Cover and berm outdoor storage/equipment areas, store spill cleanup materials in clearly marked locations, include an emergency spill kit in construction vehicles, and clean spills immediately. Limit equipment fueling to staging area as feasible, and provide secondary containment during fueling activities. Suitable for pollutants including sediment, nutrients, trash, metals, and oil and grease.
Materials Management	Stockpile Management: Limit stockpiles to within project limits of disturbance (staging area and restoration footprint). Reduce stormwater pollution from stockpiles by locating stockpiles as far away as possible from stormwater flows, watercourses, and inlets, and covering stockpiles. Protect stockpiles from stormwater runoff using temporary perimeter sediment barriers such as silt fences, fiber rolls, sandbags, gravel bags, or biofilter bags.
Materials Management	Solid Waste Management: Prevent or reduce the discharge of pollutants from solid waste by providing waste collection areas and an adequate number of containers, arranging for regular disposal, collecting site trash daily, and cleaning up spills immediately. Suitable for construction and domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes. Targeted pollutants include sediment, nutrients, bacteria, trash, oil and grease, and metals.
Materials Management	Housekeeping Practices: Maintain clean and orderly work sites; dispose of wash water, sweepings, and sediments properly; recycle or dispose of fluids properly; and train contractors in BMPs and pollution prevention. Targeted pollutants include sediment, nutrients, bacteria, trash, oil and grease, and metals.
Monitoring	Downstream Monitoring: Monitor turbidity downstream of the project site during construction activities to verify erosion control measures are effective. Evaluate need for post-construction monitoring as part of Storm Water Pollution Prevention Plan process.

As noted above, current water quality issues occur within the project site, and periodic closures of the area, including the beach, occur for public health and safety (TRNERR 2010). Tijuana Estuary is also currently listed as a CWA 303 (d) waterbody impaired by parameters including indicator bacteria, lead, low dissolved oxygen, eutrophic, nickel, pesticides, thallium, toxicity, trash, and turbidity (CCC 2019). Post-construction, the water quality within the estuary is expected to be similar to existing conditions and, during times of low sewage discharge from upstream sources, may be slightly better due to overall enhanced circulation and improved biological processes (e.g., nutrient uptake) under the proposed condition. Improved hydrologic function within the restoration areas may help to convey sediments more quickly through the southern arm of the estuary to the Pacific Ocean, thereby potentially minimizing the effects of sedimentation and enhancing natural delivery of sediment from the estuary to the nearshore. Alternative 1 would not change storm flows or the pollutant input; however, the increased tidal prism (by approximately 24% from 24.4 to 30.2 million cubic feet and 23.7 to 29.1 million cubic feet on spring flood and

ebb tides, respectively,) would increase the river mouth cross section, thereby facilitating better flow of stormwater through the estuary and out to the ocean. Therefore, Alternative 1 would not change or degrade the wet weather water quality conditions. Since Alternative 1 would reduce residence times in existing wetland areas and the river, the existing dry weather water quality conditions may be improved as compared to existing conditions (dependent on dry weather flows from upstream sources).

Construction activities and post-construction conditions would not alter the alluvial exchange between the estuary and the groundwater basin. Groundwater in the project area can reach salinities of 35 ppt currently, which is similar to sea water. Incremental increase of tidal influence to the project area would not substantially degrade groundwater quality in accordance with CEQA thresholds. Alternative 1 would increase the tidal prism and water would still continue to be present within the estuary. **As a result, implementation of Alternative 1 would not result in temporary or permanent impacts in violation, conflict with, or obstruction of water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality (CEQA Criteria A and E); thus, impacts would be less than significant under CEQA, and no significant effects have been identified pursuant to NEPA.**

The estuary is underlain by an unconfined alluvial groundwater basin that is characterized by exchange with both the overlying estuary and river and adjacent ocean waters. Hydrologic connectivity between groundwater and the estuary would not be expected to change as a result of temporary construction activities. No substantial reduction in recharge characteristics would occur during construction.

Alternative 1 would enhance the ability of the estuary to drain incoming freshwater flows currently inhibited by reduced channel capacity. Water would continue to be present in the estuary with implementation of Alternative 1. Transitional areas constructed within the restoration footprint would not impede drainage through the site. Measurable exchange between the estuary and groundwater is likely limited to the alluvial aquifer (discussed above under Groundwater Aquifer Recharge in Section 4.3.1), and increased tidal circulation within the estuary. As noted above, groundwater in the project area can reach salinities of 35 ppt currently, which is similar to sea water. Incremental increase of tidal influence to the project area would not substantially impact groundwater quality and **would not represent a substantial change to conditions that influence groundwater recharge characteristics such that the project may impede sustainable groundwater management of the basin (CEQA Criterion B), and impacts would be less than significant under CEQA. No significant effects have been identified pursuant to NEPA.**

Water levels within the estuary would not increase during construction activities relative to existing conditions, and flow regimes would remain primarily unaltered. Open water areas of the estuary would continue to be subject to existing velocities. Some increases in localized circulation

would occur due to dredge and support equipment movement but increases in erosion and flow rates would not be anticipated during construction activities. Additionally, a temporary staging area would be established adjacent to the restoration area, south of Beach Trail at a relatively unvegetated upland site, and would not require fill for use. Temporary stockpiles could also be required during construction, but would be limited to the project footprint (i.e., staging area or restoration footprint). Compliance with applicable regulations (i.e., Construction General Permit, Municipal Permit as outlined in Table 3-9, Standard Construction Practices) would be required to minimize impacts during construction activities. Erosion control would be addressed in the project SWPPP required under the Construction General Permit. Erosion-control BMPs (such as those identified in Table 4.3-2) would be developed and implemented by the contractor in compliance with existing regulations to minimize effects from erosion and sedimentation, as well as impacts on surface drainage patterns and existing drainage systems.

Alternative 1 would increase localized hydraulic efficiency of Tijuana Estuary over existing conditions by removing sediment to improve tidal prism and flow exchange, as well as flood protection. Overall, alterations to drainage patterns and circulation within the estuary would benefit hydraulic efficiency and biological resources in the estuary. Circulation would increase with channel deepening and creation within the restoration area. A greater volume of water would be able to exit the estuary during wet weather conditions and less water would be confined within the estuary, thereby reducing flooding. Alternative 1 would increase the existing spring flood tidal prism through the river mouth/tidal inlet by approximately 24%, to 30.2 mcy (Anchor QEA 2021a). The spring ebb tidal prism would increase from 23.7 mcy to 29.1 mcy. Under Alternative 1, the mean tidal prism would increase to 9.7 million cubic feet from 8.2 million cubic feet (Anchor QEA 2021a). Additionally, implementation of Alternative 1 would have a small effect on fluvial flood water levels, with nominal increased water levels confined to open space portions of the estuary (e.g., Beach Trail) that are not adjacent to human land uses (Anchor QEA 2021a).

Alternative 1 does not propose an increase of impervious area. By complying with the regulatory requirements and properly implementing appropriate BMPs, changes to surface runoff patterns within the estuary would not create substantial scour or erosion. In a post-construction setting, temporary staging areas, access routes, and other disturbed areas would be decompacted, revegetated, and restored to pre-construction conditions and/or better (e.g., planted with native species) (PDF-12) (Anchor QEA 2021a).

Thus, compliance with applicable regulatory requirements and implementation of appropriate BMPs would ensure construction and post-construction conditions of Alternative 1 would not result in a substantial alteration to existing drainage patterns that would cause substantial scour or erosion, increased runoff flow rates or volume resulting in flooding or an exceedance of drainage system capacity, or increased exposure to water-related hazards, or would impede or redirect flood flows (CEQA Criterion C). Temporary

impacts would be less than significant under CEQA, and no significant effects have been identified pursuant to NEPA.

As stated above, there is no historical precedence for large damaging seiches in the San Diego region. Seiche hazards would not increase over existing conditions because the additional wetland areas added by Alternative 1 would be relatively small in size and would not add substantial fetch (length of exposed surface) to the estuary. Mudflow typically occurs as a result of heavy rainfall on a slope that contains loose soil. Areas where construction activities are proposed to occur are not considered steep and loose slopes that would be susceptible to mudflow. The typical conditions that create geologic hazards from landslides or mudflows, such as slopes or hillsides, do not occur within the project site. Therefore, removal of materials for restoration purposes would not increase slope instability that could cause landslides or mudslides, ground failure, or other adverse geologic hazards. In addition, raised elevations such as upland and transitional slopes constructed as a part of Alternative 1 would be designed for safety under multiple conditions, including mudflows. **Increased risks of a release of pollutants from inundation by seiche, tsunami, or mudflow (CEQA Criterion D) would not result from the implementation of Alternative 1; therefore, no impacts would occur pursuant to CEQA or NEPA.**

Proposed Project

The proposed project is similar to Alternative 1, and restoration and other enhancement efforts that would occur under the proposed project would be similar to the analysis provided for Alternative 1 above. Compared to existing conditions, a greater volume of water would be able to exit the estuary during wet weather conditions and less water would be confined within the estuary, thereby reducing flooding. Similar to Alternative 1, the proposed project would increase the existing spring flood tidal prism through the river mouth/tidal inlet by approximately 24%, to 30.1 mcy (Anchor QEA 2021a). The spring ebb tidal prism would increase more than Alternative 1, from 23.7 mcy to 29.4 mcy, which would allow better drainage of tidal flows during ebb tides with implementation of the proposed project. Under the proposed project, the mean tidal prism would increase more than Alternative 1, to 10.1 million cubic feet from the current 8.2 million cubic feet (Anchor QEA 2021a). Similar to Alternative 1, the proposed project would have a small impact on fluvial floodwater levels; therefore, discussions and conclusions identified under Alternative 1 are also applicable to the proposed project. **Thus, temporary and permanent hydrology and water quality impacts, and violations to water quality standards or waste discharge requirements or activities that would otherwise substantially degrade surface or groundwater quality, resulting from implementation of the proposed project would be less than significant under CEQA (CEQA Criteria A through E) and NEPA.**

No Project/No Action Alternative

Under the No Project/No Action Alternative, tidal flows would continue to be hindered by a reduced tidal prism capacity primarily from sedimentation influences, inward migration of the barrier beach, and the subsequent loss of scouring force at the river mouth. As sea level rises in the future, these conditions could be accellerated and result in increased frequency and/or duration of closure at the river mouth, increased flood risk, and decreased water quality. Poor circulation (i.e., tidal exchange), surface water drainage, and flood protection would remain the same or continue to degrade if no alternative is implemented. There would be no change to surface runoff. No changes to groundwater interaction would occur. The No Project/No Action Alternative would maintain flood elevations and no change from existing conditions would result; therefore, no additional impact would result to the potential for exposure of people or property to water-related hazards such as flooding. There is no change from the No Project/No Action Alternative to the potential for erosion and siltation. The estuary would continue to have reduced tidal prism and decreased circulation due to the hydraulically inefficient channel system and lack of channel capacities within the estuary. In addition, maintenance would be required to remove the accumulated sediment to keep the river mouth open, as needed.

The No Project/No Action Alternative would enable existing water quality conditions to continue. Effluent from Tijuana would continue to flow downstream through the estuary and the ability of the southern arm of the estuary to drain would continue to be limited, and flooding would continue to be an issue or increase in severity. Tidal flows would continue to be reduced due to capacity loss and relatively meandering pathways towards the river mouth, resulting in continued sedimentation. No additional benefit to estuary water and sediment removal capacity would be provided. No new impacts would be anticipated by the No Project/No Action Alternative; however, the estuary environment would continue to decline. **Thus, impacts would be less than significant under CEQA (CEQA Criteria A through E), although benefits associated with the action alternatives would not be realized. No significant effects pursuant to NEPA would occur under the No Project/No Action Alternative.**

4.3.3.2 Soil Management

Construction activities and post-construction conditions involving placement of material on the beach would not alter the alluvial exchange between the estuary and the groundwater basin. Thus, impacts to the groundwater basin from soil management activities would not occur. The discussion below focuses on potential water quality impacts as a result of soil management activities.

Up to 322,000 cy of material, with ≥ 51% sand, would be placed on the beach and in the swash zone along the barrier beach to the west of the estuary. Other potential placement quantities include up to 167,000 cy and 112,000 cy with ≥ 75% and ≥ 90% sand, respectively. When depositing

material, some sediment fraction would remain suspended in the water column for various lengths of time depending on particle size and water movement. There would also be a degree of sediment resuspension in the water column of the deposition area, as well as the area of the seafloor where resident sediments would be physically disturbed and dislodged for a short period.

Sediment plumes associated with placing material within the swash zone would be subject to dispersion and dilution by ambient currents, wind, and wave action. The behavior and fate of suspended sediment plumes would vary substantially depending on the nature of the deposition operations, characteristics of the bottom sediments, and current patterns and oceanographic conditions. Regardless, the areas affected can be characterized in three ways:

- *Initial mixing zone*: the area where deposition operations dominate the process and induced currents are more important than ambient currents;
- *Near-field zone*: the area where the plume area is characterized by rapid particle settling and changes in suspended sediment concentrations with distance from the deposition; and
- *Far-field zone*: the area where the total load in the plume is slowing and diffusion is the same order of magnitude as particle settling.

In general, the initial mixing zone is associated with the area in the immediate vicinity of the point of placement (in the swash zone), whereas the transition between the near-field to the far-field zones typically occurs within several hundred feet of the point of placement. The location in the far-field zone at which the plume is no longer distinguishable from background conditions would vary in relation to the differences in turbidity and suspended sediment levels in the plume and adjacent receiving waters.

The vertical (depth-related) extent of plumes depends on the initial displacement of bottom sediments, physical characteristics and settling velocities of the sediment particles, and vertical mixing characteristics of the water column. For example, the vertical distribution of sand-sized particles disturbed when disposed material strikes the bottom may be confined to the near-bottom water layer, particularly when the bottom sediments consist of coarse-grained, rapid-settling particles and a natural density gradient is present in the water column that limits vertical mixing. In contrast, disturbed fine-grained sediments may remain suspended and distributed throughout the water column for long periods, particularly during winter (unstratified) conditions. Similarly, plumes generated by placement activities can extend throughout the water column as particles settle at varying rates depending on particle size and depth-varying current speeds.

The elevated suspended solids concentrations in turbidity plumes reduce water clarity/light transmittance, and increase discoloration. The estimated plume distance on a given day would vary according to the grain size characteristics of the material, turbulence, current speed, and to what depth in the water column the particles are resuspended. Use of the overall mean grain size

diameter indicates average plume extent. During the Fate and Transport study implemented in 2008 and 2009 along the barrier beach, nourishment was conducted using materials with a sand content of approximately 51% sand and 49% fines. While smaller quantities were placed at the barrier beach than proposed with implementation of soil management activities, the study provides context for how smaller, more fine-grained sediment would behave in the water column.

As noted above, the Tijuana River delivers a high volume of suspended sediment to the ocean, with up to 77% of that sediment consisting of fine-grained material. As a result, large turbidity plumes accompany river flows during storm events. Similar to the way smaller-grained watershed sediments are naturally added to the littoral system during storm events, the Fate and Transport study demonstrated that placement of material with approximately 50% sand directly in the swash zone allows for wave action to suspend smaller-grained material and transport it to areas farther offshore where smaller-grained material generally settles out, while larger-grained sand in the placed material remains within the littoral cell. The study found that while turbidity in the immediate area of nourishment was higher than pre-nourishment levels for the 24-hour period after placement, after several days, turbidity levels had decreased to, or close to, pre-nourishment levels. Within the swash zone and water column in the study area, residence times of approximately 1 hour were observed for fine sediments. Turbidity offshore of the swash zone was concentrated in the lower water column (Warrick *et al.* 2013). During the Fate and Transport study, numerical model simulations were conducted to compare fine-sediment plumes associated with placement of smaller-grained material with plumes resulting from natural river discharge events during storms. The study concluded that plumes of fine sediments show comparable large-scale dispersion between river outflow during storm events and beach nourishment events with finer-grained sediments (Deltares 2016). Further, monitoring confirmed that fine-sediment concentrations returned to pre-nourishment levels within 2 to 5 days (Warrick *et al.* 2013). The proposed beach placement activities would build on that Fate and Transport study and place sediment containing more than 50% sand using a similar methodology, but in larger volumes, while larger-grained material containing more than 75% sand would be placed above the mean high water mark on dry beach.

Ultimately, the study concluded that sediment plumes of fine sediments show comparable large-scale dispersion between river outflow during storm events and beach nourishment events with finer-grained sediments, fine sediment concentrations returned to prenourishment levels within 2 to 5 days, and nourishment plumes behaved comparably to river suspended sediment plumes delivered through the Tijuana River (Deltares 2016; Warrick *et al.* 2013).

Flows from the Tijuana River and other adjacent sources also currently contribute to exceedance of regulatory limits for pathogens such as enterococcus and coliform bacteria, as noted in Table 4.3-1. The Beach and Bay Water Quality Program implemented by San Diego County Department of Environmental Health and Quality tracks ocean water quality and manages beach closures when necessary. During nourishment associated with the Fate and Transport Study, fecal indicator bacteria

(enterococcus) were also monitored, and found to increase briefly (for less than 1 day) within approximately 300 meters of placement activities (Rippy *et al.* 2013). Material used for the Fate and Transport Study was removed from the Goat Canyon retention basin, which directly drains flows from Tijuana, Mexico. While material for TETRP II Phase I would be excavated from the estuary and would not directly include urban drainage from Mexico, there is the potential for bacteria to be present in the soils identified for beach nourishment. If present, bacterial levels could temporarily exceed water quality standards and degrade water quality in conflict with current standards.

The primary changes to water quality expected from soil management would include temporary and localized increases in turbidity and suspended sediment concentrations, as well as the potential for temporary exceedance of water quality standards identified in the Ocean Plan. As noted above, turbidity depends on numerous environmental factors, although it is anticipated effects would be short term and localized. PDF-13 requires that longitudinal training dikes be constructed at placement sites if material is delivered to beach areas via pipeline to reduce nearshore turbitity. Additionally, turbidity associated with placement is anticipated to remain within the natural variability currently associated with current river flows. Therefore, no long-term incremental increase in turbidity would be anticipated due to the diluting capacity of the ocean, localized nature of the turbidity plumes, dissipation once placement operations ceased, and natural variability of turbidity due to river flows. The placement of material also has the potential to result in temporary, localized exceedance of regulatory limits (e.g., bacteria). While project-related exceedance would be temporary, and the site currently experiences closures due to exceedances from watershed flows, bacteria release due to placement of material from the restoration site would contribute incrementally to existing water quality impairments along the beach. As part of compliance with the Section 401 water quality certification required from the RWQCB, water quality monitoring would be conducted to verify water quality standards are met. It is also anticipated that coordination with the Southern California Dredged Material Management Team will occur during the permitting phase of the project. **Soil management would potentially generate or release pollutants that are in violation of applicable federal or state standards; therefore, temporary impacts resulting from soil management activities would be significant pursuant to CEQA (CEQA Criteria A and E) and NEPA.**

Soil management would not alter groundwater supplies with placement of material in designated fill locations. **Thus, soil management would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin, and impacts would be less than significant under CEQA (CEQA Criterion B). No significant effects to the quality of the groundwater supplies have been identified pursuant to NEPA.**

Soil management activities would not alter the existing drainage pattern of the ocean, nor would water levels and flow velocities and regimes with the estuary be increased, relative to existing conditions during construction activities. Soil management does not propose the addition of

impervious surfaces. Thus, potential erosion or siltation, increased flooding, exceeded use of stormwater drainage systems, and impeded or redirected flood flows would not occur as a result of soil management activities. **A less than significant impact would result under CEQA (CEQA Criterion C), and impacts to existing drainage patterns would not be significant pursuant to NEPA.**

There is no historical precedent for large damaging seiches in the San Diego region, and the placement of soil at the beach would not increase seiche hazards over existing conditions. The typical conditions that create geologic hazards from landslides or mudflows, such as slopes or hillsides, do not occur within the placement area. Beach nourishment would not increase slope instability and gradually sloped contours on the beach would be designed for safety under multiple conditions. **Increased risks of a release of pollutants from inundation by seiche, tsunami, or mudflow (CEQA Criterion D) would not result from the implementation of Alternative 1; therefore, no related impacts pursuant CEQA or NEPA would occur.**

4.3.4 Avoidance, Minimization, and Mitigation Measures

Temporary impacts to water quality could potentially occur during beach nourishment activities conducted as part of soil management. These potential temporary impacts would be considered a significant impact under CEQA and NEPA. Mitigation measures Water Quality-1 and 2 would be implemented to minimize the potential for temporary water quality impacts identified pursuant to both CEQA and NEPA.

Water Quality-1: Prior to beach nourishment with material excavated from the restoration and/or channel enhancement area, soil testing will be conducted for contamination for regulated constituents (including bacteria).

a. If testing confirms contamination of soils in conflict with regulations, contaminated soils will be diverted for transport off-site to an appropriate reuse or disposal site.
b. If testing confirms soils would not conflict with regulatory limits, beach nourishment will be initiated.

Water Quality-2: During beach nourishment, twice weekly water quality monitoring will be conducted for regulated constituents within 100 feet (down current from placement). If water quality violations are identified, additional samples will be taken along the beach adjacent to the river mouth and/or other stormwater input locations to confirm violations are due to beach nourishment associated with TETRP II Phase I. If the project is confirmed responsible for water quality violations, then beach nourishment will stop and soils in the immediate area of excavation will be diverted off-site to an appropriate reuse or disposal site. Beach nourishment will be continued when excavation has moved to a location expected to have acceptable quality and testing confirms no violations are anticipated.

Twice weekly water quality monitoring will be reinitiated to identify additional violations, and provide for diversion, if necessary, as described above.

While implementation of Water Quality-1 would minimize the potential for water quality violations, testing may not identify inactive or dormant bacteria. Additionally, Water Quality-2 provides information related to water quality violations and halts the potential for continued impact but does not necessarily avoid the impact that has already occurred. **Thus, potential temporary impacts would remain significant and unavoidable under CEQA, and significant pursuant to NEPA**.

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4.4 COASTAL PROCESSES

Coasts are divided into natural compartments called littoral cells. Each cell contains a complete cycle of sediment dynamics including sources, transport paths, and sinks. The presence of sand on a particular beach depends on the transport of sand within the littoral cell. Beaches are dynamic environments subject to seasonal and annual movement of sand offshore and onshore, as well as alongshore within a generally defined littoral cell. Modification of structures or water body connections to the coast (e.g., river mouth inlets) can also influence sand movement, or transport, in a littoral cell. Restoration within the estuary would not directly affect the littoral zone or have the potential to affect coastal processes; therefore, this analysis focuses specifically on the soil management component of the proposed project that would result in beach nourishment, as well as intermittent excavation at the river mouth.

4.4.1 Affected Environment

Beach sand is a product of weathering of the land. The primary natural sources for the region's beaches are sediment carried from upcoast and inland areas by rivers and streams and, to a lesser extent, coastal bluff erosion. Sediment from the watershed historically supplied area beaches including Imperial Beach adjacent to Tijuana Estuary. Sediment would be transported down creeks and rivers to the ocean; once flows enter the ocean, larger grain size material settles out in the nearshore and enters the beach sand cycle, while smaller grain sediment remains suspended and settles farther offshore in sandy bottom areas. Through urbanization and development activities, natural sediment transport in the region has been hindered or eliminated. Much of the freshwater that naturally flowed to coastal wetlands is diverted to farms and cities or otherwise captured in detention basins or reservoirs that slow flows and capture sediment before it can reach the shoreline. Sediment entering the estuary is also more likely to settle out and not be exported to the nearshore.

Sand and sediment trapped upstream would otherwise enter the littoral cell and sand cycle and nourish coastal beaches. A littoral cell is a coastal reach bounded by physiographic features (e.g., submarine canyons, coastal headlands, harbors, etc.) where sediment cycles primarily occur. Littoral cells are generally bounded on one side by the beach, extend seaward as wave energy dissipates, and end at the depth of closure, where sand movement is minor and doesn't measurably cycle back to the shore. Sand movement within the nearshore ocean adjacent to beaches occurs continually and varies seasonally. Imperial Beach, including Tijuana Estuary and TETRP II beach nourishment site, is located within the Silver Strand Littoral Cell, which extends from south of the international border to the Zuniga Jetty at San Diego Bay. Historically, the Tijuana River has been a primary source of littoral sand delivery to the coast (Zedler 1996), as well as intermittent sand nourishment projects in the littoral cell (Warrick *et al.* 2013). Annual sediment output from the Tijuana River is highly variable, but can reach approximately 2 million cubic meters (Warrick *et al.* 2013).

Littoral sand moves in both cross-shore and longshore directions. The natural cross-shore sand cycle is a seasonal process. Sand moves on- and offshore along the beach profile, which extends from the above-water (exposed) shoreline area to the offshore depth of closure, the depth to which seasonal sand movement is detected. Typically for the San Diego region, greater sand movement from the exposed beach to the offshore portion of the profile occurs in the winter due to large storms and waves, followed by a period of sand gain to the exposed beach during the summer's more gentle conditions and surf. Thus, the exposed portion of the beach is generally wider in the summer and narrower in the winter. Adjacent to the estuary, waves are refracted and focused towards the south end, but reflect this seasonal variability (Warrick *et al.* 2013).

Sand also moves alongshore within a littoral cell; interruptions in the coastline can lead to losses in littoral sand, particularly where tidal flow enters water bodies such as estuaries, lagoons, or harbors. Moving sand is pulled into these river mouths along with the flood tide, accumulating in a flood shoal within the river mouth, resulting in less littoral sand to maintain beaches and reducing the amount of tidal influence within the adjacent water body. Since the flood shoal is composed of littoral material, it is primarily sand and has a relatively large grain size, and settles out relatively close to the river mouth location. Bypassing, in which littoral sand captured in river mouths is removed and placed on adjacent beaches downcoast to enable the sand to continue to follow longshore drift patterns, provides no permanent or long-term loss to littoral sand supply occurs. Periodic excavation of the Tijuana Estuary river mouth with placement on adjacent beaches is currently implemented by the USFWS to maintain tidal flow into the estuary, supporting continued littoral sand movement through the cell and supporting beach function.

To help offset the loss of natural sand sources no longer reaching the San Diego region shoreline, previous projects have supplemented the natural process of beach building by periodically replenishing beach sand from offshore or upland sources. Nourishment in the immediate project area includes, most notably:

- RBSPs I and II, in which placement occurred north of the Tijuana River mouth and barrier beach (2001 and 2012, respectively),
- Fate and Transport study (2008 and 2009)
- Periodic removal of material from Tijuana River mouth (four openings throughout 2016 and 2017)

Beach nourishment represents one option that can help restore the barrier beach adjacent to the site, a critical project objective, and provides an opportunity for beneficial reuse of material excavated as part of the proposed project. Beach nourishment supplements the sand supply available on the beach for dune accumulation as well as within the littoral system. Since sand is mobile and would move on and offshore as well as laterally along the shore as described below, natural processes allow gradual distribution through the system. Erosion of the coastline is not halted, but sand can provide a buffer

while on the beach in specific locations. Beneficial reuse of suitable material as beach/nearshore nourishment is one way to help buffer the effects of coastal erosion that may become even more critical in the future with potential sea level rise. Beach and littoral cell nourishment can have different objectives and therefore utilize different types of material, with differing results. Regional beach nourishment efforts north of the river mouth within Imperial Beach (RBSP I and II) were implemented for protective purposes adjacent to infrastructure and development. The projects therefore utilized large grain-sized material that is generally less mobile both along the beach profile as well as along shore to extend the protective services of the project. TETRP II Phase I has a unique opportunity to beneficially reuse material that may otherwise require disposal as littoral cell nourishment, supporting the project objective of restoring the barrier beach with the distinction that the primary objective is not to build a beach but rather to nourish the littoral cell with material that would then be available to support natural beach building processes as described above. While historically, beach nourishment efforts have been generally limited to use of material that contains at least 80% sand, the pilot study implemented in 2008 and 2009 as the Fate and Transport study showed that beach nourishment using material that has relatively low sand content (~50%) can be a successful way to add sand to the littoral cell without resulting in significant environmental effects. Although discharges are variable, the Tijuana River has been estimated to discharge approximately 90,000 cubic meters, or over 117 thousand cubic yards (kcy), of suspended sediment to the Pacific Ocean each year. Approximately 77% of that material (91 kcy) is fine grained (Warrick *et al.* 2012). Similar to the way smaller grain watershed sediments are naturally added to the littoral system during storm events, the Fate and Transport Study demonstrated that placement of material with ~50% sand directly in the swash zone allows for wave action to suspend smaller grain material and transport it to areas farther offshore where smaller grain material generally settles out, while larger-grained sand in the placed material remains within the littoral cycle. The proposed project would build on that Fate and Transport study and place material containing more than 50% sand using a similar methodology, but in larger volumes, with larger-grained material containing more than 75% sand placed above the mean high water mark on dry beach.

4.4.2 CEQA Thresholds of Significance

Would the project:

a) Disrupt the littoral system due to beach nourishment or excavation from the river mouth; or

b) Increase risks of damage to coastal structures, including inundation by wave refraction seiche, tsunami, or mudflow.

The CEQA thresholds of significance for coastal processes were derived from a combination of thresholds listed in Appendix G of the CEQA Guidelines and thresholds used in the EIR/EIS for the San Elijo Lagoon Restoration Project (SCH #2011111013) and the 2012 RBSP EA/EIR (SCH

#2020051063). Thresholds from these projects were considered in addition to those provided by CEQA Appendix G in order to consider effects specific to the littoral system, which is unique to coastal projects.

4.4.3 Environmental Evaluation

The 1991 TETRP EIR/EIS did not evaluate coastal processes; therefore, the following analysis is independent of the previous environmental document.

4.4.3.1 Soil Management

The coastal littoral process is a dynamic process, and the coastal sand cycle is both annual and seasonal; as a result, the baseline is not a static condition. Due to this cyclical nature, defining the baseline for the project must take into account this fluctuation in "existing conditions." As described above, the beach grain size envelope has been modified due to other beach nourishment projects in the vicinity. Most notably, the 2012 SANDAG Regional Beach Sand Project II placed coarse-grained sand (D50 = 0.53mm) over fine-grained (D50 = 0.25mm) sediments (Ludka *et al.* 2022), thereby creating short-term conditions that do not necessarily reflect the shoreline long-term grain size distribution. Beach placement Options 3 through 5 reflect the opportunity to use the results from the Fate and Transport study to guide beneficial reuse options under the proposed project, utilizing similar locations and placement methods for material that may have been considered unsuitable for beach nourishment in the past. Soil management options that would result in transport of material for placement at upland locations, including Nelson Sloan Quarry, other approved project sites, or disposal at Otay Landfill, would not have the potential to affect coastal processes in the Silver Strand Littoral Cell; therefore, this analysis focuses on those options that would involve beach nourishment.

Beach nourishment strategies proposed for the project (i.e., Options 3, 4, and 5) include both placement of larger-grained material on the dry beach as well as placement of smaller-grained material in the swash zone, similar to the Fate and Transport study implemented in 2008 and 2009. Preliminary soil characterization efforts indicate that Alternative 1 would generate up to 322,000 cy of material excavated from the restoration area that may be available for beach nourishment, including up to 167,000 cy of material containing more than 75% sand that could be placed on the dry beach, and up to 155,000 cy of material containing more than 51% sand but not enough sand to be considered suitable for dry beach placement that would be placed in the swash zone. The proposed project would provide slightly smaller volumes for beach nourishment (305,000 cy total, with 158,000 cy of material containing over 75% sand and 147,000 cy of material containing more than 51% sand). Material identified for placement on the beach would contain more than 75% sand and is anticipated to be gradually distributed by seasonal beach cycles across the beach profile and alongshore as described above. Some of the sand placed would also migrate up the beach profile

and support dune building processes along the barrier dune. The gradual distribution of material through the nearshore beach profile would not considerably affect littoral processes in the area, but rather provide an incremental amount to existing processes. Material with less sand (51% to 74%) would be placed in the swash zone for more rapid dispersal in the littoral cell through wave and tide action. While this material may be dispersed more rapidly, the fine-grained portion of the material would be transported farther from the site similar to outflows from the river mouth as described in Section 4.3. Larger-grained sand contained within this material would be less mobile, but would be anticipated to distribute along the beach profile and in the vicinity of the nourishment activity. Over time, longshore currents would transport the sand throughout the littoral cell. Volumes of sand transported up and down the coast would decrease with distance from the nourishment site, and are not anticipated to result in measurable changes to the beach profile adjacent to development in the City of Imperial Beach, which is located approximately 1 mile north of the nourishment footprint. Additionally, as discussed in Chapter 3, sediment testing would be required to confirm specific volumes of material with grain size suitable of materials for beach placement activities based on further discussions with permitting agencies.

Material placed as part of periodic excavation from the river mouth could total 10,000 cy annually, but would be focused on the dry beach above the high tide line. River mouth excavation to maintain tidal flow to the estuary would continue to occur under the proposed project. While sand removed from the river mouth would be used for beach nourishment on adjacent unvegetated beach areas, this sand is littoral material that has been temporarily removed from the sand cycle and trapped in the river mouth. Removing this captured sand and bypassing the river mouth can be considered as a cyclic redistribution of sand within the littoral cell and is not considered a new source of littoral sand. Additionally, excavated material would primarily be placed south of the river mouth to minimize the potential of river mouth closure. By placing material to the south of the river mouth, the predominant southerly longshore transport would be more likely to carry material away from the river mouth, thereby minimizing the potential for closure. Since it is not new sand adding incrementally to the littoral sand cycle, and placement is not anticipated to contribute to river mouth closures, it is not anticipated to result in adverse effects to littoral and coastal processes.

Material placed for beach nourishment during implementation of TETRP II Phase I would be gradually placed across a large potential beach placement footprint, and would not change the profile of the beach substantially enough to affect littoral currents or processes. **No disruption to the littoral system would occur and there would be no impact associated with beach nourishment or periodic excavation from the river mouth in accordance with CEQA (CEQA Criterion A) or NEPA.**

Within the project site, no structures are located within the beach placement footprint. Material placed for beach nourishment or periodic excavation from the river mouth would be limited to the beach placement footprint. As identified through monitoring during the Fate and Transport study,

material placed in the swash zone is anticipated to remain in the swash zone or be transported offshore, while material placed on the dry beach is anticipated to remain in place for the short term, and distributed gradually over time through the littoral cell. As it is distributed alongshore, sand volumes will become less measurable as distance from the placement site increases. Accumulation of sand on the beach adjacent to the estuary or upcoast adjacent to existing development within the City of Imperial Beach in volumes large enough to affect risk of damage to coastal structures is not anticipated. **There would be no increased risk of damage to coastal structures, and no impact would occur pursuant to CEQA (CEQA Criterion B) or NEPA.**

4.4.4 Avoidance, Minimization, and Mitigation Measures

No significant impacts related to coastal processes would result from the proposed project, and no mitigation measures are required.

4.5 HAZARDOUS MATERIALS AND PUBLIC SAFETY

This section addresses hazardous materials and public safety associated with implementation of the proposed project, focusing on topics such as hazardous materials, wildland fires, vectors, and recreational safety. Flooding and flood hazards are discussed in Section 4.3, Hydrology and Water Quality. This section discusses these issues in terms of the potential exposure of contaminants and other hazards to people and the environment.

4.5.1 Affected Environment

Regulatory Setting

The following laws, regulations, policies, and plans are applicable to this resource area:

- EO 12088 – Federal Compliance with Pollution Control Standards
- California Code of Regulations (CCR); Title 14 Division 1.5
- San Diego County Vector Control Program

Hazardous Materials Sites

The project site is not listed as a hazardous materials site on State of California Hazardous Waste and Substances lists compiled pursuant to Government Code Section 65962.5, and no known sites are located in the immediate vicinity of the project area (DTSC 2020). However, portions of TRNERR in the southern arm were used as a gunnery and practice bombing range by the military until the site was declared surplus by the Department of Defense and was transferred to the State of California in 1971.

Previous investigations were conducted by the Corps to evaluate the presence of munitions and explosives of concern (MEC), munitions debris (MD), and munitions constituents (MC) at the project site. An Inventory Project Report (INPR) was completed in 1994 and a supplemental INPR was completed in 2004. The INPR resulted in no observations of MEC and MD. The CSP Ranger with TRNERR at the time of the INPR site visit reported that .50-caliber shells had been recovered during beach surveys for scrap metal in the 1970s. In 2003, an Archive Search Report (ASR) was completed which also included evaluation of historical observations. The ASR did not note MEC detections during remote site observations and no incidents or reports of MD related to bombing activities were recorded. However, some historical responses prior to 1993 by the Explosives Ordnance Disposal team to remove .50-caliber shells were documented (Corps 2012).

A Site Inspection (SI) was also conducted by the Corps in 2007 within the southern arm of TRNERR that included site reconnaissance, collection of surface soil samples, water samples, MC,

explosives, and metals. The SI concluded there were no MEC or explosives in the soil and no visual evidence of practice bomb usage. However, small arms MD (.30- and .50-caliber) were observed in some areas and seven nonessential-nutrient MC metals (i.e., nutrients in which an organism is capable of producing in sufficient amounts, such as aluminum, barium, copper, lead, molybdenum, strontium, and zinc in this instance) were detected above background concentrations in surface soil samples collected. Based on the results of the Screening Level Ecological Risk Assessment conducted for surface water east of the project site, there is a potential for an unacceptable risk to human health from exposure to molybdenum in surface water likely from contact with skin or inhalation. The results of the Screening Level Ecological Risk Assessment conducted for surface water indicated that there were potential ecological risks due to exposure to copper, molybdenum, and strontium (Corps 2012).

Vectors

The term "vector" is used to denote a carrier of disease organisms. The vector may be purely mechanical (houseflies spreading enteric organisms), or biological, wherein the disease-causing organism multiplies or undergoes change within the vector (the development of encephalitic viruses in mosquitos). In some cases, estuaries can provide breeding conditions for vectors, specifically mosquitos, due to shallow and/or stagnant standing water. The conditions that tend to favor mosquitos are stagnant, fresh, or brackish water with minimal circulation, narrow channels or a limited circulation system, and dense vegetation. Key management strategies to control vector populations in water bodies focus on breaking the larval life cycle before they mature and become adult mosquitos. Strategies focus on increasing water circulation and wave action, varying water levels, decreasing vegetation such as cattails, decreasing nutrients and reducing water temperatures, and providing improved access for natural predators of larval and adult mosquitos (aquatic and airborne) to potential breeding areas. Aerial larvicide treatments can also become more effective if channels are extended through dense vegetation that may otherwise prevent the larvicide from reaching the water surface. Common natural predators of aquatic mosquito larvae include *Gambusia* mosquito fish), native killifish and stickleback, other small native and nonnative fish species, and the aquatic nymph stages of dragonflies and damselflies (Odonata). Predators of adult mosquitos include frogs, bats, swallows, purple martins, and many other insectivorous bird species.

Eleven species of salt marsh mosquitos are known to breed in the saline and brackish pools of the estuary. Three species (*Aedes taeniorhynchus, Anopheles hermsi,* and *Culex tarsalis*) are of particular concern because of their potential as pests and possible disease vectors. Currently, biochemical control methods (such as *Bacillus thuringienses israelensis* [BTI]) are being used to combat larvae and adults in areas where there is a high concentration of these mosquitos (TRNERR 2010). Vector control is necessary to curtail the possibility of mosquito-borne human disease, although current rates of disease transmittal within San Diego County remain relatively low. Due

to biological sensitivity, TRNERR management seeks to minimize the use of chemical treatments by primarily using biological agents instead (TRNERR 2010). The County of San Diego holds a Refuge Special Use Permit allowing the use of certain compounds and actions for the control of mosquito populations on the refuge.

Recreational Safety

The estuary is an actively used recreational amenity for the public in San Diego's south county, as described in Section 4.2, Recreation and Public Access. Various areas of the TRNERR, including Border Field State Park and the intertidal beach fronting the ocean (but excluding the back dunes), have traditionally been used for compatible coastal-related recreation (TRNERR 2010). TRNERR is available for public recreation in designated areas, with recreation generally concentrated in areas near the Visitor Center, in Border Field State Park, and along designated trails. Recreational activities throughout TRNERR include horseback riding, hiking, picnicking, wildlife viewing, and a variety of beach uses. Marsh Trail (pedestrian only, no dogs or bicycles) bisects the southern portion of the project site in a north-south manner, connecting to Beach Trail.

A primary concern specifically associated with placement of material on a beach or in the swash zone is ensuring public safety during construction. Daily or seasonal lifeguard services along the beach are not supported and towers are not present along the beach adjacent to the project site. Typical recreational safety at beach locations is provided by emergency response services by City of Imperial Beach lifeguards, State Parks lifeguard and rangers, and Refuge Federal Wildlife Officers, if available. Additionally, as discussed under Section 4.3, beach closures currently occur during times of water quality contamination. Monitoring (daily and weekly stations) is currently conducted by the County of San Diego Department of Environmental Health and Quality. The County provides water quality testing and issues advisories when beach water quality exceeds health standards and closures for water-based activities when sewage or chemical spills impact beach water quality. Placement of material during the Fate and Transport Study resulted in elevated bacteria levels in adjacent ocean waters due to placement activities.

Another recreational public safety concern at beach locations are scarps (or escarpments) that develop naturally along beach profiles and vary in height due to substantial changes in the beach profile (i.e., drastic drop in elevation). Scarp height is a function of the breaking wave height and the elevation of the existing beach berm. Large scarps that form as a result of beach nourishment may result in safety hazards due to substantial changes in the beach profile (i.e., drastic drop in elevation).

The soil management and river mouth excavation project component could place suitable dredged materials from the estuary on the beach or in the swash zone. These areas, by nature, are not

susceptible to hazards related to vectors or wildland fires and those topics are not further analyzed in association with proposed soil management.

Sediment Analysis

Detailed sediment collection and analysis occurred within the project site in March 2021 in support of the proposed project (Bodhi 2021). Fieldwork was conducted in accordance with the Sampling and Analysis Plan prepared by Anchor QEA in 2019 (Anchor QEA 2019). The objectives of the investigation were to determine the suitability of material for beneficial reuse at swash zone placement areas and to identify various soil management options. Results of this sampling effort are summarized in Table 4.5-1.

Table 4.5-1
Sediment Sampling and Analysis Results at the Project Site

Sediment Characteristics	Description
Metals	Concentrations of detected metals did not exceed the mean background levels, with the exception of arsenic. Arsenic was detected from two areas at concentrations of 3.77 and 4.04 milligrams per kilogram (mg/kg), respectively. Arsenic concentrations detected did not exceed the Department of Toxic Substances Control's recommended screening concentration (12.0 mg/kg). Based on the results of the metal analyses and comparison with screening levels, metals are not a concern for the proposed uses.
Total Organic Carbon (TOC)	TOC is a measure of the organic carbon in soil and is not a chemical contaminant that requires screening. Levels ranged from 0.27 to 1.19% in samples collected at the project site.
Pesticides	DDT, DDE, and chlordane were detected but at trace concentrations. Based on the minor detections, pesticides are not a concern for the proposed uses.
Volatile Organic Compounds (VOCs)	Six VOCs were detected: acetone, 2-butanone, benzene, carbon disulfide, ethylbenzene, and toluene. Of these, acetone is a common laboratory contaminant and may not be attributed to the site. The remaining five were detected at low concentrations. Based on the low frequency of detections at low concentrations, VOCs are not a concern for the proposed uses of materials.
Semi-volatile Organic Compounds (SVOCs)	Fourteen SVOCs were detected in trace concentrations well below respective Environmental Screening Levels. Based on low frequency of detections at low concentrations, SVOCs are not a concern for the proposed uses.

To characterize chemical suitability of the sediments sampled within the project site, numerical Sediment Quality Guidelines (SQGs) set by NOAA for aquatic sediment were used as an informal, interpretive tool that includes two SQG concentrations thresholds: "Effects Range-Low" (ERLs), where adverse effects were not likely with concentrations below this level; and "Effects Range-Median" (ERMs), concentrations above which adverse effects were more likely (NOAA 1999).

Concentrations of total petroleum hydrocarbons, polychlorinated biphenyls and congeners, and herbicides were not detected in the samples analyzed.

4.5.2 CEQA Thresholds of Significance

Would the project:

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 § 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 2 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;

g) Create a substantial public health hazard from management or disposal of dredged/excavated material; or

h) Substantially increase human exposure to vectors, such as mosquitos, that are capable of transmitting significant public health diseases (threshold considered for restoration and enhancement only)?

4.5.3 Environmental Evaluation

The 1991 TETRP EIR/EIS concluded that the implementation of Model Marsh and 495-acre restoration project would have no significant adverse impacts to human health. Thus, potential hazardous materials and public safety impacts are analyzed below as a result of implementation of the proposed project and are discussed separately from the analysis identified in the 1991 TETRP EIR/EIS.

4.5.3.1 Restoration/Enhancement

Alternative 1

As described in Section 4.5.1 above, chemical analysis conducted within the southern arm of the estuary identified seven nonessential-nutrient MC levels above background concentrations in surface soil samples taken in the southern arm of the estuary in 2012. A subsequent sediment characterization study was conducted in 2021 that found most of the soil characteristics tested for fell below their respective threshold levels, including metals, where adverse effects were not likely with concentrations below this level. It is likely that between the initial study conducted in 2012 and subsequent analysis performed in 2021, a majority of the surface soil has been washed away via natural processes (waterflows from storm and rain events, etc.). While pesticides and metal levels were detectable in estuary material, detections were at trace concentrations or below the ERL threshold concentrations where adverse effects were not likely. Thus, because concentrations levels were below the defined ERL thresholds or were detected at trace amounts, these contaminants levels would not pose an adverse effect on human health during construction activities, including transportation operations. Water quality issues include contamination of the water column within the estuary, as noted in Section 4.3. During periods when the project area is inundated by contaminated water, periodic closures of the project area, including Border Field State Park and the beach, occur for public health and safety (TRNERR 2010). **Thus, potential risk associated with contaminants in excavated or dredged material or exposure to contaminated water (CEQA Criteria A and G) would be less than significant under CEQA for Alternative 1 and would not be significant pursuant to NEPA.**

Construction equipment would require a number of petroleum products such as fuel, hydraulic fluids, and lubricants for effective operation. Fuel replenishment would be required daily for most of the heavy equipment. Consistent with standard construction practices identified in Table 3-9, fueling and/or maintenance activities would occur at the designated staging area, which would be closed to use by the public to minimize potential exposure or access to the hazardous materials associated with the construction activities. The contractor would be required to prepare a Spill Prevention Control and Containment (SPCC) plan, as included in Table 3-9, for hazardous spill containment. The SPCC plan would require that spills be cleaned up in accordance with permit conditions and that employees understand the proper procedures associated with a cleanup. As required by law (Health and Safety Code, Division 20, Chapter 6.95, Article 2, Section 25500-25520), storage, handling, transport, emission, and disposal of hazardous materials associated with construction activities would be in full compliance with local, state, and federal regulations, which provide requirements to verify proper and appropriate actions specific to minimizing hazardous risk. Additionally, as stated in Section 4.5.1, the project site is not listed as a hazardous materials site and known sites are not within the vicinity of Alternative 1 (DTSC 2020). While previous investigations have evaluated historical observations of military use remnants within the southern

arm of the estuary, based on INPR and SI investigations, it is not anticipated that MEC, MD, or MC would be encountered at the project site during construction activities. **Therefore, potential risk associated with transport, use, or disposal of hazardous materials or location near a hazardous material site would be minimized (CEQA Criteria A, B, and D), and impacts pursuant to CEQA would be less than significant under Alternative 1. No significant effects related to hazardous materials have been identified pursuant to NEPA.**

There are no schools or daycare centers within the vicinity of the project site. **Therefore, no impacts associated with hazardous emissions, materials, substances, or waste within one-quarter mile of an existing or proposed school (CEQA Criterion C) under Alternative 1 would occur. No significant impacts pursuant to CEQA or NEPA have been identified.**

No public or public use airport is within 2 miles of the project site. **Thus, a safety hazard or excessive noise for people residing or working in the project area (CEQA Criterion E) would not occur and, therefore, no significant impacts pursuant to CEQA or NEPA have been identified.**

Emergency vehicles use Monument Road and Beach and South Beach Trails to access the beach when necessary. As detailed in Section 4.2, Recreation and Public Access, Beach and South Beach Trails may be temporarily closed during construction in order to maintain public safety while the eastern segments of Monument Road would remain open. Alternative access routes would remain accessible for emergency vehicles throughout the construction period both to the project site and beach. Additionally, as required by PDF-4, the project proponent would coordinate with other emergency response personnel, as applicable, to make them aware of the proposed project schedule and timeframe and would identify alternative emergency access routes throughout temporary construction activities. Some traffic trips on local roadways would be required for various transportation needs such as worker trips and equipment delivery; however, the construction activities at the project site would not obstruct or hinder the ability of the local transportation network and designated roads to serve emergency purposes or evacuation routes if an emergency were to occur. **Therefore, Alternative 1 would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (CEQA Criterion F), and impacts would be less than significant pursuant to CEQA and NEPA.**

As described above, estuaries can provide breeding conditions for vectors, specifically mosquitos, due to shallow and/or stagnant standing water. During construction, heavy equipment, construction vehicles, and other tools/storage facilities would be present within the estuary. There is some potential for rainwater or other water sources to become impounded in small containers or wheel ruts. Given the rapid mosquito life cycle, an impoundment of 7 to 10 days can allow for successful breeding. As described in Standards Construction Practices, Table 3-9, sources of impounded water resulting from construction equipment would be removed which would minimize that new breeding conditions would not be created during construction.

In the long term, restoration and enhancement activities would modify the habitat and water areas within the project site. By its nature to establish inundation frequency that would support the desired habitat distribution and increase the tidal prism, Alternative 1 design would create unfavorable habitats for mosquitos as water circulation and tidal circulation would interrupt the mosquito reproduction process, leading to mortality of eggs, larvae, and pupae. Eggs laid on water during one point of the tide may be left exposed during the subsequent low tide. Tidal action can also result in other benefits for mosquito abatement, including increased salinity, which reduces the ability of freshwater vectors to reproduce, and the higher volume of cooler ocean water within the tidal wetland habitats would also create a poor temperature-based environment for larvae survival.

Implementation of Alternative 1 would result in a less-conducive vector breeding condition and reduce the public health and safety risk associated with mosquito-borne diseases compared to existing conditions. Substantial increases in human exposure to vectors are not anticipated during construction or after implementation of this alternative. Thus, implementation of the project would not substantially increase the public health and safety risk associated with mosquito-borne diseases. **Thus, implementation of Alternative 1 would not substantially increase human exposure to vectors, such as mosquitos, that are capable of transmitting significant public health diseases (CEQA Criterion H), and, therefore, no significant impacts pursuant to CEQA or NEPA have been identified.**

Proposed Project

The proposed project is similar to Alternative 1, and restoration and other enhancement efforts that would occur under the proposed project would not change or alter hazardous materials or public safety effects as analyzed for Alternative 1 above; thus, discussions and conclusions identified under Alternative 1 are also applicable to the proposed project. **Therefore, the proposed project would not create a significant hazard to the public or environment through routine transport or disposal of hazardous materials; interfere with emergency response services; create a substantial public health hazard from management or disposal of dredged/excavated material; or substantially increase human exposure to disease transmitting vectors (CEQA Criteria A through H), and impacts under both CEQA and NEPA would be less than significant.**

No Project/No Action Alternative

Under the No Project/No Action Alternative, impacts related to public safety and risks associated with hazardous materials would remain similar to existing conditions. Impacts would be less than significant for both of these issues. However, the condition at the estuary associated with vectors would continue to be exacerbated without implementation of the proposed project. Under the No Project/No Action Alternative, no actions would be taken to improve the tidal circulation within the

estuary and conditions would continue to accumulate stagnant waters that attract mosquitos, thereby increasing the change for exposure of vector-borne diseases in the nearby areas. While this issue is currently being addressed by the County of San Diego and other land managers within TRNERR, no long-term plan is in place, besides the proposed project, to help reduce vector-related issues. **No adverse impacts would occur under the No Project/No Action Alternative and the existing conditions would remain unchanged. Therefore, implementing the No Project/No Action Alternative would not result in any significant impacts pursuant to CEQA (CEQA Criteria A through H) or NEPA.**

4.5.3.2 Soil Management

Soil management efforts would involve similar construction operations as analyzed for Alternative 1 and the proposed project in Section 4.5.3.1, above; thus, discussions and conclusions identified under Alternative 1 and the proposed project are also applicable for transport of hazardous materials and emergency response services **(CEQA Criteria A through F and H)**, and **impacts would be less than significant under CEQA and NEPA.**

Beach nourishment with material excavated from the restoration and channel enhancement areas may result in water quality violations, as noted in Section 4.3. If water quality violations occur, the project could result in a public health hazard from soil management strategies incorporating a beach nourishment component. Exposure of the public to elevated levels of bacteria within portions of the beach open to recreational activities would be considered a significant impact (CEQA Criterion G) under CEQA and NEPA. **Therefore, soil management would create a significant hazard to the public and/or the environment through management or disposal of dredged/excavated material, representing a significant impact under CEQA and NEPA.**

4.5.4 Avoidance, Minimization, and Mitigation Measures

Impacts associated with potential exposure of the public participating in water-related recreational activities along the beach to bacteria levels that may exceed health standards would be considered significant. **Implementation of Haz Mat-1 would reduce the impact to below a level of significance under CEQA and would avoid significant effects under NEPA.**

Haz Mat-1: CSP or their authorized representative shall notify the County of San Diego Department of Environmental Health and Quality if water quality monitoring conducted for the project identifies water quality violations for constituents that may exceed health standards and require action for public safety. CSP or their authorized representative will coordinate with the County to provide advisory and/or closure signage as necessary to alert the public to exposure to potential health hazards.

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4.6 BIOLOGICAL RESOURCES

This section addresses the potential impacts to biological resources associated with the project, specifically the potential for the proposed project to impact sensitive habitats and species during project construction, as well as post-construction. Since activities associated with restoration grading/channel enhancement and beach nourishment/soil management activities would occur within areas of contiguous vegetation communities that can support similar sensitive species, a consolidated impact analysis is provided for this section. The analysis is largely based on the Biological Technical Report prepared for the project (AECOM 2021a).

4.6.1 Affected Environment

Regulatory Setting

The following laws, regulations, policies, and plans are applicable to this resource area:

- Federal Endangered Species Act
- Migratory Bird Treaty Act
- Bald and Golden Eagle Protection Act
- Magnuson-Stevens Fishery Management and Conservation Act, as amended 1996 (Public Law 104-267)
- Clean Water Act
- EO 11990, Protection of Wetlands
- EO 13112, Invasive Species
- California Endangered Species Act
- California Fish and Game Code Section 3503 and 3503.5 – Protection of Birds, Nests, and Raptors
- Fully Protected Species under the California Fish and Game Code
- California Native Plant Protection Act
- Porter-Cologne Water Quality Control Act – California Water Code Section 13000 *et seq.*

Biological Study Area

A Biological Study Area (BSA), which includes an area larger than the restoration footprints for Alternative 1 and the proposed project, was identified to assess relative impacts associated with the proposed project alternatives. The BSA is a somewhat arbitrary boundary defined to encompass the generalized construction footprint of TETRP II Phase I project components, including wetland restoration, beach nourishment, and preservation of native upland and transitional areas. It is important to note the BSA represents a relatively small portion of the estuary, and extensive open space areas are located outside of the BSA within TRNERR and along the beach. The BSA for

TETRP II Phase I primarily includes the southern arm of the estuary in the area of Model Marsh, various tidal channels in the area of the river mouth that may be important to tidal influence in the future and adjacent beach areas that could be affected by the proposed project. The western extent of the BSA includes barrier beaches that front and protect the estuary, and have historically been subjected to seasonal wave erosion (Tierra Environmental Services 2008). The southern extent of the BSA extends almost to Monument Mesa at the United States/Mexico border. The northern boundary is located just south of main stem of the Tijuana River. The eastern boundary of the BSA extends to North Beach Trail that runs along the east side of the project site.

Biological field surveys and assessments to classify biological resources within the BSA included vegetation mapping, special-status plant surveys, special-status wildlife surveys, and a jurisdictional assessment. The surveys were conducted by various consultants including AECOM and Nordby Biological Consulting, and agencies or technical specialists such as CSP, TRNERR staff, and the USFWS. In addition, during the initial phases of the Feasibility Study, updated surveys of vegetation and selected wildlife species were conducted to adequately address potential project benefits and impacts. This section describes the existing environmental setting of the BSA, including the regional context of the estuary, vegetation communities, plant species, wildlife species, rare and sensitive plant and wildlife species either known or potentially occurring in the BSA, potential jurisdictional areas, and wildlife corridors. The information is compiled from focused survey results and review of previous project studies; details regarding these surveys, their location and year, and the surveyors are included in the Biological Technical Report (AECOM 2021e). It should be noted that presence within the BSA does not equate to presence within the disturbance footprint of the project.

Vegetation Communities

Vegetation communities are assemblages of plant species that typically coexist. These vegetation communities also provide habitat for wildlife species. Within each community, the proportion of native and exotic plant species varies greatly, and most of the communities described below are either dominated by or support some nonnative species, a situation compounded by freshwater inflows and sediment deposition. A description of each vegetation community within the BSA is provided below. In addition, the acreages of each vegetation community and cover type within the BSA are provided in Table 4.6-1, and their distribution is shown in Figure 4.6-1.

Table 4.6-1
Vegetation Communities and Other Cover Types within the BSA (Acres)[1]

Vegetation Communities and Other Cover Types	BSA
Wetlands	
Subtidal/Intertidal Channel	18.4
Southern Coastal Salt Marsh	
Low Marsh	11.4
Mid-High Marsh	62.2
Mudflat	5.4
Disturbed Salt Panne	11.4
Subtotal Wetlands	***108.8***
Uplands	
Transitional	78.8
Native Upland	46.7
Nonnative Upland	17.4
Subtotal Uplands	***142.9***
Other Cover Types	
Beach	28.1
Dune	25.7
Roads/Trail	3.4
Subtotal Other Cover Types	***57.2***
TOTAL	**308.8**

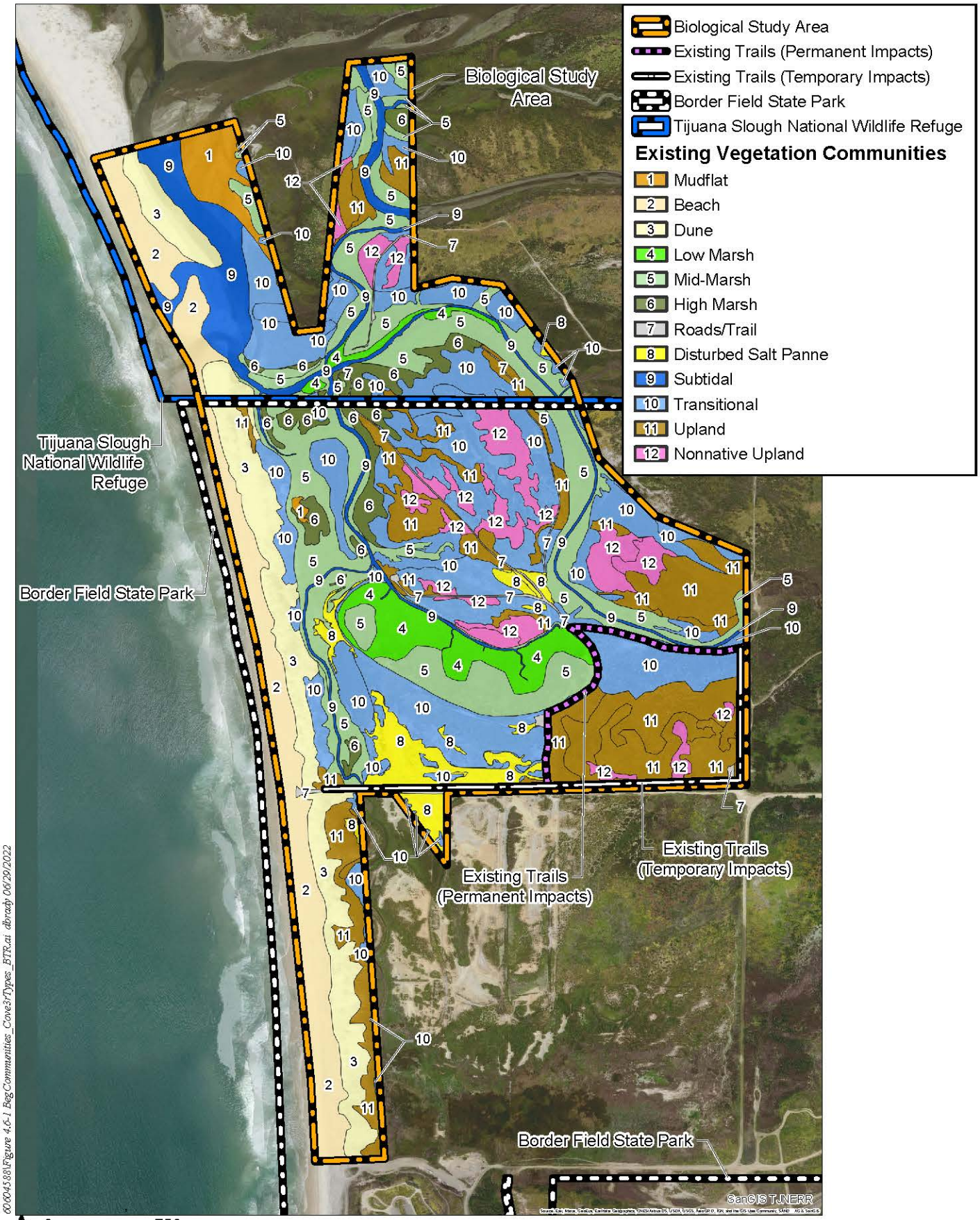
[1] Totals may not sum due to rounding.

Wetland Vegetation Communities

Wetland habitats identified within the BSA are considered sensitive due to extensive historical losses of wetlands nationwide and the value of these habitats to support sensitive species and wildlife movement.

Subtidal/Intertidal Channel

Subtidal habitat is a continuously submerged aquatic community that provides important foraging and resting areas for many bird species and also provides important fish and invertebrate habitat. Existing tidal channels are designated as subtidal, rather than intertidal, as a sill at the mouth of the estuary prevents ebb tide from fully draining the channels. Subtidal/intertidal channels are unvegetated and may be considered intertidal mudflat if exposed during the lowest tide. Intertidal channels provide important foraging and resting areas for many bird species and also provide important fish and invertebrate habitat. Subtidal areas are primarily focused at the river mouth and in main channel areas, while intertidal channels are dispersed throughout the BSA.



Note: The Tijuana River mouth location is not fixed. Impacts were calculated based on the inlet position when the hydraulic modeling was conducted and may shift again before the project is constructed.

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San Diego County, California
TETRP II Phase I EIR/EIS

FIGURE 4.6-1 EXISTING VEGETATION COMMUNITIES WITHIN THE BSA

Southern Coastal Salt Marsh

Southern coastal salt marsh is a dominant vegetation community within the BSA. While approximately 73.6 acres of salt marsh occur within the limits of the BSA, the project was designed to avoid or minimize impacts to this valuable habitat to the extent possible. Historically, this vegetation community extended over a greater area than it does today and was much more pristine. Much of the coastal salt marsh community that remains in the BSA today is remnant of the days before sedimentation impacted the area, and extensive areas of coastal salt marsh exist outside of the BSA within TRNERR, as well. The majority of this remnant community within the excavation footprint has been impacted by sediment deposition and has been converted to ruderal upland and invaded by weedy, nonnative species. As such, the function of this typically productive community has been severely compromised. For the purpose of this project, southern coastal salt marsh has been further segregated by elevational bands ranging from 4.5 feet to 7.0 feet NAVD 88. The two sub-communities are further defined by elevation, which influences the frequency of tidal inundation, as well as soil salinity with low marsh establishing in areas receiving more frequent tidal inundation at lower elevation than mid- and high marsh.

Low Marsh. Low marsh in southern California salt marshes is dominated by California cordgrass (*Spartina foliosa*), which forms a dense canopy approximately 3 feet in height. This is the preferred nesting habitat of light-footed Ridgway's rail, a federally and state-listed endangered bird. Low marsh in the project area occurs between approximately +4.5 feet to +5.0 feet NAVD 88, and is unaffected by invasive plants.

Mid-High Marsh. Although mid-high marsh is typically dominated by Pacific pickleweed (*Salicornia pacifica*), several other plant species are associated with this community, including; marsh rosemary (*Limonium californicum*), alkali heath (*Frankenia salina*), and marsh jaumea (*Jaumea carnosa*). Within the higher zone of this habitat, typical species include alkali heath, glasswort (*Arthrocnemum subterminale*), shoregrass (*Distichlis littoralis*) and saltgrass (*Distichlis spicata*). Like low marsh, the mid-high marsh has few invasive plants, especially in areas that receive regular tidal influence (Uyeda *et al.* 2013).

Generally, northern portions of the BSA include more intact coastal salt marsh habitat than the southern portion. Low and mid-high marsh exists in the BSA primarily within the Model Marsh restoration site. Coastal salt marsh is dispersed throughout areas planned for improved channel connections in the northern portion of the project site.

Mudflat

Tidal mudflats are coastal wetlands that form when mud is deposited by tides or rivers. Most of the sediment within a mudflat is within the intertidal zone, and thus the flat is submerged and

exposed approximately twice daily. Mudflats are typically important habitats for wildlife, including invertebrates and migratory birds. Tidal mudflats within the BSA are surrounded by channels and coastal salt marsh, and mostly occur towards the northern portion of the BSA.

Disturbed Salt Panne

Disturbed salt panne represents a habitat type that is often unvegetated or supports primarily nonnative plant species. Salt panne can be described as a basin or small depression that traps marine waters during the highest spring tides and rainfall during wet periods. During summer months, water in these basins rapidly evaporates, resulting in hypersaline soils devoid of vegetation. During the winter, the pannes hold water and support algae and aquatic insects (Zedler *et al.* 1992). Typically, salt pannes hold water only for a short period each year. Consequently, the productivity and complexity of the communities associated with this habitat are not well understood (Zedler *et al.* 1992). These areas can support nesting and foraging shorebirds, most notably black-necked stilts (*Himantopus mexicanus mexicanus*), American avocet (*Recurvirostra americana*), and western snowy plover. Salt panne in the project area is disturbed and includes both naturally formed habitats, but also large expanses of anthropogenic, sparsely vegetated areas caused by sediment deposition and compaction (e.g., due to former military activity). Much of the salt panne is gradually transitioning to disturbed upland community and has been invaded by nonnative grasses. Most of the disturbed salt panne habitat within the BSA is located just north and south of Beach Trail.

Upland Vegetation Communities

Many upland vegetation communities are considered sensitive because they provide valuable nesting, breeding, and/or foraging habitat for special-status wildlife species. Upland communities often form large matrices typified by a broad variety of species structure and composition. However, as mentioned above, most upland vegetation communities within the BSA are dominated by or support nonnative plant species.

Transitional

The term transitional community is used to describe vegetation associations above the highest tide elevations but still influenced by the saline soils within the salt marsh wetland. This term has been used by numerous wetland biologists to describe a community that supports a mix of high elevation coastal salt marsh plant species and upland plant species. Typically, this community occurs as a narrow band where the distribution of upland and wetland plant species overlap at or just above the elevation of the highest tides (Zedler *et al.* 1992). Within the project area, the transitional community occurs as a large area that once supported salt marsh or where grading has created transitional community from degraded marsh and salt panne. As a result of sedimentation and past agricultural practices, native shrub species have colonized these areas. Plant species observed in this community included glasswort, California desert thorn (*Lycium californicum*), spreading

goldenbush (*Isocoma menziesii* var. *menziesii*), bush seepweed (*Suaeda nigra*), big saltbush (*Atriplex lentiformis*), and alkali-heath. Invasive species include crown daisy (*Glebionis coronaria*), five-hook bassia (*Bassia hyssopifolia*), crystalline iceplant (*Mesembryanthemum crystallinum*), and black mustard (*Brassica nigra*). Transitional communities encompass most of the southern portion of the BSA with other wetland and upland habitat types interspersed throughout.

Native Upland

Upland communities in the BSA occur at elevations that are higher than transitional communities and include a mix of native and nonnative plant species. Some upland areas are dominated by native plant species while others are primarily nonnatives. Native plant species typical within these areas include big saltbush, spreading goldenbush, bush seepweed and arrow weed (*Pluchea sericea*). In addition to the native species that make up the upland communities, some nonnative species exist as well and include tree tobacco (*Nicotiana glauca*), annual beard grass (*Polypogon monspeliensis*), ripgut grass (*Bromus diandrus*), and crystalline iceplant. Broad expanses of upland areas are mapped within the eastern portion of the BSA, including a majority of the area proposed for salt marsh restoration. A small linear area of upland runs north to south directly adjacent to the barrier beach at the very southwestern portion of the estuary.

Nonnative Upland

Nonnative uplands occur at elevations similar to other upland communities but are composed primarily of nonnative plant species. Much of this community is composed of nonnative grasslands and ruderal areas (areas that are highly disturbed and may have been used for agriculture in the past). These areas support crystalline iceplant, ripgut grass, soft chess (*Bromus hordeaceus*), foxtail chess (*Bromus madritensis* ssp. *rubens*), dock (*Rumex* sp.), wild radish (*Raphanus sativus*), crown daisy, tree tobacco, and star thistle (*Centaurea* sp.). Within the nonnative upland community, some native species also found in these areas have been identified and include spreading goldenbush, broom baccharis (*Baccharis sarothroides*), and four-winged saltbush (*Atriplex canescens* ssp. c*anescens*). Nonnative upland is located throughout the BSA with clusters generally adjacent to transitional and upland communities.

<u>Other Cover Types</u>

Beach

Beaches are dynamic environments with little to no vegetation due to winds and waves, salt spray, shifting sands, high temperatures, and desiccation. Beaches have the potential to support

specialized invertebrates, as well as serve as important habitat for nesting, roosting, and foraging birds. Beach habitat is found in the far western portion of the BSA.

The beach nourishment area identified for the proposed project is a sandy beach, fronting barrier dunes with vegetation along the crest. Sandy beaches are generally dynamic environments, with sand movement and changing dry/wet conditions. Organisms living within the sand column are typically mobile and migrate up and down the beach profile depending on tide, as well as up and down coast depending on sand conditions. Sandy beaches can also be a location for California grunion spawning. Spawning generally extends from March through August and occurs at night. During spawning events, eggs are laid on the beach and incubate for approximately 10 days before hatching. Some bird species also use sandy beaches to forage for invertebrates, including western snowy plovers, and other shorebirds, gulls, and seabirds. Specific use of a beach is variable, depending on beach conditions at the time. Within Tijuana Estuary, western snowy plovers are known to utilize the beach for nesting (Patton 2020a). California least terns are also known to historically use the site for nesting (Patton 2020b). In 2020, nests on the beach were focused north of the river mouth, although a number of nests were also observed within the estuary, east of the beach, between the Beach/South Beach Trails and the parking lot. The site also is identified as western snowy plover critical habitat.

In the nearshore zone off the beach within the area of sand movement, the ocean floor is primarily sandy bottom habitat, with the closest mapped hard bottom surface cobblestone reef areas, located between the Tijuana River mouth and the Imperial Beach pier north of the beach placement footprint (Warrick *et al.* 2013; SANDAG 2011). No hard bottom reefs or vegetated intertidal or marine habitats are located in proximity to the beach nourishment site. Invertebrates and fish within sandy bottom habitats are adapted to shifting sediment and turbidity, and generally move between shallow subtidal areas and deeper depths.

Dune

The dune community is a sparsely vegetated plant community, dominated by suffrutescent plants. Plant species that are characteristic of this community include red sand-verbena (*Abronia maritima*), beach sand-verbena (*Abronia umbellata*), and beach-bur (*Ambrosia chamissonis*). Within the project area, this vegetation community is dominated by beach-bur, beach sand-verbena, beach evening-primrose (*Camissoniopsis cheiranthifolia), w*ith nonnative species such as sea rocket (*Cakile maritima*) and iceplant (*Carpobrotus edulis*). Dunes are located at the far western portion of the BSA, between the beach and other wetland/upland habitats mapped within the BSA.

Roads/Trail

The roads/trail cover type is generally unvegetated bare ground that consists of a dirt pathway. Four designated trails exist within the BSA, including the Marsh Spur, Marsh, Beach/South Beach, and Coast North/South Trails, the latter of which provides access to the beach for recreational users, land managers, and emergency response services. Designated trails are located throughout the BSA. Some informal trails also currently exist within the interior of the BSA.

Jurisdictional Waters and Wetlands

An informal assessment of wetlands and waters was conducted using a single parameter of vegetation/wetland type to estimate potential resources under the jurisdiction of the Corps, CDFW, RWQCB, and/or CCC within the BSA. Potential jurisdictional waters of the U.S. and state were classified by wetland habitat and other waters of the U.S. (in the form of wetlands or nonwetland waters/ordinary high water mark [OHWM]). Habitats considered to represent potential areas of jurisdictional wetlands and waters include intertidal channels, mudflat, low marsh, and mid-high marsh. This single parameter approach represents a conservative estimate of potential jurisdictional resources (e.g., does not take into account more restrictive parameters such as hydric soils or hydrology); therefore, state jurisdictional areas are anticipated to be inclusive of federal jurisdictional areas. Federal jurisdictional waters as regulated by the Corps also exist at the potential beach placement footprint. Federal jurisdictional waters along the coast include beach/water below the High Tide Line under Section 404 and 401 of the CWA and below the Mean High Water Line under Section 10 of the Rivers and Harbors Act.

Based on the conservative preliminary jurisdictional assessment conducted for the proposed project, a total of approximately 110.1 acres of potential jurisdictional waters and wetlands are estimated to occur within the BSA and are considered potential waters of the U.S. and/or state under the jurisdictional purview of the Corps, RWQCB, and/or CCC.

Sensitive Flora

Sensitive plant species are those that are either legally protected under the FESA or CESA or other regulations. Plant species that are not legally protected under the CESA and/or FESA may still be protected by other regulations, or considered by the scientific community to be sufficiently rare to qualify for special-status protections. California Rare Plant Rank (CRPR) (formerly California Native Plant Society [CNPS] List) List 1A, 1B, and 2 species are fully considered, as they meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (CESA) during the preparation of environmental documents relating to CEQA. Many CRPR List 3 and 4 species do not meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (CESA) but are strongly recommended for consideration under CEQA

(CNPS 2001). Based on mapping efforts and research conducted by TRNERR, 57 sensitive plant species were determined to have a general range that includes the BSA or whose habitat occurs within or near the BSA and/or vicinity (TRNERR 2019).

No federally or state-listed plant species with the potential to occur were detected within the BSA during project surveys. Based on the environmental conditions, surveyor accessibility within the site, and species' phenologies during the survey period, it is expected that these species would have been detected if present. Since these species were not detected, they are not discussed throughout the remainder of this report.

One nonlisted, special-status plant species, Nuttall's acmispon (*Acmispon prostratus*), was detected within the BSA (Tierra Environmental Services 2008). Species not detected within the BSA are not discussed throughout the remainder of this report.

Nuttall's Acmispon. Nuttall's acmispon (CRPR 1B.1) occurs throughout California and Baja California within coastal dune and scrub habitats (CNPS 2021). Nuttall's acmispon was recorded at the southwestern end of the BSA, both north and south of Monument Road along the barrier beach.

Critical Habitat and Essential Fish Habitat

The USFWS designates critical habitat for some federally threatened and endangered species. Critical habitat consists of specific geographic areas that contain features essential to the conservation of endangered or threatened species, and may require special management and protection (USFWS 2021). The areas shown on critical habitat maps are often large, but it is important to note that the entire mapped area may not be considered critical habitat. Only areas that contain the primary constituent elements (PCEs) required by the target species are considered critical habitat. PCEs are the elements of physical or biological features that, when laid out in the appropriate quantity and spatial arrangement to provide for a species' life-history processes, are essential to the conservation of the species. PCEs may include but are not limited to (1) space for individual and population growth and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing (or development) of offspring; and (5) habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species (USFWS 2021).

Of the federally listed species known to occur within Tijuana Estuary, one has critical habitat mapped within the BSA: western snowy plover. Critical habitat encompasses the beach and barrier dunes west of the estuary, and extends just north of the Tijuana River mouth. PCEs for western snowy plover include the sandy, barrier beach and dune habitats located at the very western portion of Tijuana Estuary.

Essential Fish Habitat (EFH) is identified in the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH for Pacific groundfish and coastal pelagic species includes the shoreline within the beach placement footprint, as well as in the estuary although, while fish may occur within the deeper waters of the adjacent estuary and river, they are not expected to occur within the limited shallow waters in the channel enhancement area. Historically, no eelgrass habitat occurs within the BSA.

Sensitive Fauna

A discussion of non-special-status wildlife species is provided below, followed by discussions of special-status species detected during surveys and considered resident/breeding species within the BSA. These sections in particular draw on focused surveys conducted within the BSA for the Feasibility Study and other nearby projects, as well as previous studies in Tijuana Estuary, as identified in the Biological Technical Report prepared for the project (AECOM 2021a).

Non-Special-Status Species

Habitat degradation due to mouth closure and freshwater input from trans-border sewage flows have resulted in decreased diversity of benthic invertebrate species over the last several decades (Zedler and Nordby 1986). Sampling from 2017 through 2018 identified 22 species of invertebrates within the BSA (TRNERR 2019), with the majority of identified species native.

Historically, Tijuana Estuary has supported a diverse fish assemblage, with dominant fish species and diversity fluctuating over time. Fifteen species of fish were captured during sampling conducted in 2017 and 2018 (TRNERR 2019), with dominant fish species including arrow goby (*Clevelandia ios*), topsmelt (*Atherinops affinis*), and California killifish (*Fundulus parvipinnis*). Average fish species richness per station within the BSA were slightly higher than averages in the northern arm of the estuary, although density of fish tended to be lower in the southern arm compared to the north (TRNERR 2019). Overall, areas most impacted by sediment deposition had lower species richness compared to areas less impacted by cross-border flows.

California grunion (*Leuresthes tenuis*) are a managed game species by CDFW and are therefore included in this discussion. Grunion spawning generally extends from March through August, with their peak season falling between late March and early June. Within the BSA, beach conditions are generally sandy and provide suitable spawning conditions for California grunion. Historically, grunion have spawned on beaches within Imperial Beach.

Insects play an important role within many native habitats, acting as pollinators for specific plants, an important source of prey, and predators that aid in management of potentially detrimental species (Atkins 2021; Daly 1978). Surveys identified 11 orders of arthropods in areas of

pickleweed-dominated mid-marsh habitat (Williams *et al.* 1989). Additionally, insects, including Gabb's tiger beetle (*Cicindela gabbi*), mudflat tiger beetle (*C. trifasciata sigmoidea*), sandy beach tiger beetle (*C. hirticollis gravida*), and sand dune tiger beetle (*C. latesignata latesignata*), are known to occur at Tijuana Estuary (Nagano 1982).

Sampling for reptiles and amphibians was conducted within the BSA beginning in March of 1997 through spring of 2001 (Fisher *et al.* 2000). Reptile species observed during surveys included: California legless lizard (*Anniella pulchra*), southern alligator lizard (*Elgaria multicarinatus*), western skink (*Eumeces skiltonianus*), western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), coast horned lizard (*Phrynosoma coronatum*), western blind snake (*Leptotyphlops humilis*), coastal rosy boa (*Charina trivirgata*), night snake (*Hypsiglena torquata*), California king snake (*Lampropeltis getula*), Baja California coachwhip (*Masticophis flagellum*), California whipsnake (*Masticophis lateralis*), San Diego gopher snake (*Pituophis melanoleucus*), and Southern Pacific rattlesnake (*Crotalus oreganus helleri*). One amphibian species, recorded during surveys, was the Pacific treefrog (*Hyla regilla*).

More than 374 bird species have been documented in the Tijuana River Valley, which can be attributed to the availability of a variety of habitats including salt marsh, brackish marsh, intertidal mudflats, coastal scrub, dunes, and riparian habitats (Tierra Environmental Services 2008). The estuary is an important stop along the Pacific Flyway and serves as a foraging and resting area for species traveling between breeding sites in the Arctic and sub-Arctic regions and southern wintering sites (Tierra Environmental Services 2008). Avian species detected within the BSA fall within the following taxonomic groups: grebes and pelicans, waterfowl, herons and egrets, small waders, large waders, gulls and terns, raptors, and landbirds (Kus and Ashfield 1989). Avian species documented during these surveys included California brown pelican (*Pelecanus occidentalis californicus*), snowy egret (*Egretta thula*), house finch (*Carpodacus mexicanus*), mallard (*Anas platyrhynchos*), great egret (*Ardea alba*), double-crested cormorant (*Phalacrocorax auratus*), willet (*Catoptrophorus semipalmatus*), song sparrow (*Melospiza melodia*), black phoebe (*Sayornis nigricans*), American wigeon (*Anas americana*), great blue heron (*Ardea herodias*), American coot (*Fulica americana*), northern mockingbird (*Mimus polyglottos*), and northern shoveler (*Anas clypeata*), among others.

Several species of mammals use the estuary and have been recorded during focused surveys and predator control efforts. Based on this information, the following native mammal species have been observed within the estuary: California jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*), agile kangaroo rat (*Dipodomys agilis*), deer mouse (*Peromyscus maniculatus*), cactus mouse (*Peromyscus eremicus*), brush mouse (*Peromyscus boyli*), dusky-footed woodrat (*Neotoma fuscipes*), western harvest mouse (*Reithrodontomys megalotis longicaudus*), California vole (*Microtus californicus*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), long-tailed weasel (*Mustela frenata*), and gray fox (*Urocyon cinereoargenteus*). Bobcats (*Lynx rufus*) have also been observed within the vicinity

of the BSA by Tierra Environmental Services as well as CSP staff personnel (Tierra Environmental Services 2008). Non-native mammals include Virginia opossum (*Didelphis virginianus*), feral cats (*Felis catus*), feral dogs (*Canis familiaris*), house mouse (*Mus musculus*), Norway rat (*Ratus norvegicus*), and black rat (*Rattus rattus*).

Special-Status Species

Special-status species that were detected in the BSA during focused surveys or known to occur in the estuary from previous project studies, with potential to occur in the BSA, are discussed below.

Federally Listed Species

Three species, listed as federally threatened or endangered, were detected on-site during previous studies, and are considered resident/breeding within the BSA. One additional species, least Bell's vireo, is included because it is located east of the BSA along the materials transport route:

- Least Bell's vireo
- Light-footed Ridgway's rail
- Western snowy plover
- California least tern

Least Bell's Vireo. The least Bell's vireo was federally listed as endangered in 1986 (51 FR 16474) and listed as endangered by the State of California in 1980. The least Bell's vireo breeding season extends from March through September. During the breeding season, the least Bell's vireo is restricted to riparian woodland and riparian scrub, mainly in the coastal lowlands. Early to mid-successional riparian habitat is typically used for nesting by the vireo as this habitat supports the dense shrub cover required for nest concealment, as well as a structurally diverse canopy for foraging (Kus 2002). While least Bell's vireo were historically not found in the Tijuana River Valley because of lack of appropriate habitat (Safran *et al.* 2017), some of the existing riparian zones of the valley now support this bird. The nearest least Bell's vireo habitat is located in the alluvial delta associated with Goat Canyon east of the BSA. While the species is located outside of the BSA it is included because territories are located in proximity of the southeast portion of the BSA and directly adjacent and along Monument Road within TRNERR that is identified as part of the material transport route under the soil management options for the project. In 2019, protocol least Bell's vireo surveys detected 12 pairs with definitive evidence of nesting observed within 7 locations (Blackhawk 2019).

Light-footed Ridgway's Rail. The light-footed Ridgway's rail was federally listed as endangered on October 13, 1970 (35 FR 16047) and is also listed as endangered by the State of California. The light-footed Ridgway's rail breeding season extends from February 15 through September 15. The species is restricted to coastal salt marshes in southern California where vegetation is dominated

by cordgrass and pickleweed. It can also be found in brackish and freshwater marshes with cattails (*Typha* sp.) and bulrushes (*Schoenoplectus* sp.). Light-footed Ridgway's rails forage in higher marsh vegetation and along tidal creeks and at the interface between vegetation and adjacent mudflats. Light-footed Ridgway's rail is a reclusive species that nests and utilizes relatively small patches of preferred habitat when isolated from external anthropogenic disturbances (Zembal *et al.* 2011; Zembal and Hoffman 2012). Within Tijuana Estuary, the light-footed Ridgway's rail is a rare, year-round resident that can be heard calling, particularly in the early morning and evening. Breeding territories are usually focused in established coastal salt marsh habitats, such as in Model Marsh and the northern arm of the estuary. Since 1980, the light-footed Ridgway's rail population of Tijuana Estuary has been monitored with numbers of nesting pairs gradually increasing over that period of time. However, much fluctuation also has been observed from year to year (Tierra Environmental Services 2008). Approximately 94 pairs of light-footed Ridgway's rails were detected during a census conducted at the Tijuana Slough National Wildlife Refuge in 2020 (Zembal *et al.* 2020). In 2016, protocol light-footed Ridgway's rail surveys were completed for the Border Field State Park Monument Road Project in appropriate breeding habitat. During these surveys, 20 individual light-footed Ridgway's rails were detected within salt marsh and transitional habitats (Blackhawk 2016), including within northern portions of the BSA.

Western Snowy Plover. The western snowy plover is listed as federally threatened and is identified by the State of California as a state species of special concern. The western snowy plover was listed by the USFWS on March 5, 1993 (58 FR 12874) and a recovery plan was adopted for this species in 2007 (USFWS 2007). Critical habitat was designated on September 29, 2005 (USFWS 2005). Western snowy plovers occur along the Pacific coast from southern Washington to Baja California. It nests on undisturbed, flat areas with loose substrate such as sandy beaches and dried mudflats along the California coast, and forage primarily on the wet sand at the beach-surf interface where they feed on small crustaceans, marine worms, insects, and amphipods. Nesting generally occurs between April 1 and September 15. Within the BSA, the beach, sandy dunes, and mudflats provide breeding and foraging habitat. Monthly monitoring from early March through October 2020 was conducted at Border Field State Park and the Refuge in potential western snowy plover nesting areas (Patton 2020a). Approximately 57 individuals were observed on March 5 with post-breeding roosting flocks reaching a high of 97 individuals on September 7.

California Least Tern. The California least tern is federally and state- listed as endangered. This tern was listed by the USFWS on October 13, 1970 (35 FR 16047). The California least tern breeding season extends from April 15 through September 15. The species breeds from San Francisco Bay south to Baja California. In San Diego County, it is a fairly common summer resident from early April to the end of September (Unitt 2004). Important nesting sites in the county include Mission Bay, Aliso Creek, Batiquitos Lagoon, mouth of Tijuana Estuary, Chula Vista, North Island Naval Air Station, San Elijo Lagoon, and Lindbergh Field. The species historically nested colonially on beaches that are undisturbed, sparsely vegetated, flat areas with

loose, sandy substrate. Few beach nesting areas remain, and least terns are now found in varied habitats ranging from mudflats to airports. The species typically forage in areas with water less than 60 feet in depth and within 2 miles of roosting sites, although considered opportunistic and will often shift their behavior in response to local prey patterns (Atwood and Minsky 1983). Within the BSA, California least terns have been observed breeding and foraging in available beach, dune, and intertidal habitats. Weekly monitoring within the BSA in 2020 documented at least 203 nests initiated by 128 to 145 pairs between May 15 and July 16 (Patton 2020b). Sixty-two to 67 estimated pairs established 97 nests on the upper beach immediately north of the mouth of the estuary, south of the barrier dunes, while 66 to 78 pairs established 106 nests between the beach parking lot and Beach Trail at Border Field State Park.

State-Listed Species

Three species listed as state threatened or endangered, were detected during previous studies and are considered resident/breeding within the BSA. As previously noted, least Bell's vireo is also included due to presence east of the BSA and along the material transport route:

- Least Bell's vireo
- Light-footed Ridgway's rail
- California least tern
- Belding's Savannah sparrow

Least Bell's vireo, the light-footed Ridgway's rail, and California least tern are federally listed and were discussed above. Belding's Savannah sparrow is described in detail below.

Belding's Savannah Sparrow. The Belding's Savannah sparrow is a state-listed endangered species known to occur from Santa Barbara County to northern Baja California. In San Diego County, populations have been recorded from Tijuana Estuary, San Diego Bay, Mission Bay, San Dieguito Lagoon, Peñasquitos Lagoon, San Elijo Lagoon, Batiquitos Lagoon, Agua Hedionda Lagoon, Santa Margarita River mouth, and Aliso Creek mouth (Unitt 2004). Appropriate habitat for this species, including salt marsh, mudflats, and beach, occurs throughout much of the BSA. The Belding's Savannah sparrow breeding season extends from February 15 through September 15. Surveys conducted in 2004 in the southern arm of the estuary estimated approximately 116 to 179 pairs of Belding's Savannah sparrow (Tierra Environmental Services 2008). A portion of this survey area, south of Monument Road, accounted for approximately 75% of these observations. The BSA is considered north of Monument Road and therefore accounts for 25% of the total observations observed in 2004 (approximately 29 to 45 pairs). Surveys were also conducted in April 2016 in support of the Border Field State Park Renovation Project. Approximately 107 to 118 Belding's Savannah sparrow territories were recorded in 2016 (Patton *et al.* 2016). Overall, surveys detected an increase in territories both north and south of Monument Road from 2015 to 2016, including territories within the BSA and extending east along Monument Road.

Nonlisted Special-Status Species

In addition to the federally and state-listed species discussed above, four nonlisted wildlife species of special concern by CDFW were detected during historical studies and, are therefore, conservatively assumed to be present within the BSA. Nonlisted special-status wildlife species detected during previous studies include wandering skipper (*Panoquina errans*), Baja California coachwhip (*Colubur fuliginosus*), coast horned lizard (*Phrynosoma blainvillii)*, and northern harrier (*Circus cyaneus*). These species are discussed below.

Wandering Skipper. The wandering skipper (*Panoquina errans*) is restricted to estuarine and tideland habitats where adults are often associated with saltgrass. The species has been historically detected within the BSA (Williams *et al.* 1989). Suitable breeding and foraging habitat is present throughout the BSA in areas where widespread coastal salt marsh exists.

Baja California Coachwhip. The Baja California coachwhip generally occurs throughout Baja California, mainly in coastal sand dunes, shrubland, and grassland habitats. This species was historically detected within the estuary (Fisher *et al.* 2000, Mitrovich *et al.* 2009) and suitable coastal sand dune habitat occurs within the BSA.

Coast Horned Lizard. The coast horned lizard inhabits a wide variety of habitats including coastal sage scrub, chaparral, grassland, coniferous forest, oak woodland, and riparian forest. This species has been historically detected in the dunes along the western portion of the BSA (Fisher *et al.* 2000). Suitable habitat for the species occurs in sandy or friable soils within open habitat areas.

Northern Harrier. San Diego County lies at the southwest edge of the harrier's breeding range in North America (Johnsgard 1988). Harriers breed in marshes and grasslands, and forage in grasslands, agricultural fields, wetlands, and open coastal sage scrub. Much of the BSA provides suitable nesting and foraging habitat for northern harriers. At Tijuana Estuary, at least three nests were documented within the BSA during Belding's Savannah sparrow surveys conducted in 2004 (Tierra Environmental Services 2008).

Wildlife Movement

Connectivity, or the ability of organisms to move through a landscape, is essential in heterogeneous landscapes, especially in increasingly urban settings, for the persistence of healthy and genetically diverse animal communities. Corridors can facilitate connectivity on different temporal and spatial scales, and help species populations distributed in and among habitat patches, to persist over time. Local corridors allow resident animals to access critical resources (food, water, and cover) in other areas that might otherwise be isolated. Tijuana Estuary is important for wildlife

movement in that it provides a large area of habitat for core populations of sensitive wildlife and plant species. In general, wildlife species are likely to use habitat in the BSA for movements related to home range activities (foraging for food or water, defending territories, searching for mates, breeding areas or cover). While Tijuana Estuary is considered a local corridor, it is not considered a functioning regional corridor.

4.6.2 CEQA Thresholds of Significance

Would the project:

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 CDFW or USFWS;

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 CDFW or USFWS;

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) 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

g) Result in an introduction of invasive species of plants into a natural open space area?

4.6.3 Environmental Evaluation

The 1991 TETRP EIR/EIS concluded that implementation of the Model Project and project-related activities would result in the short-term loss of intertidal pickleweed marsh, high marsh, cordgrass, and marsh vegetation, but that areas impacted by construction-related activities would be rehabilitated after construction. Additionally, based on the original project design, the EIR/EIS also found there would be losses of nesting and foraging habitat for Belding's Savannah sparrow, foraging habitat for clapper rails, and habitat for the wandering skipper butterfly and tiger beetles, and that foraging of the California least tern and brown pelican would be adversely affected. Based on the proposed project design, while short-term impacts would occur to existing habitat, these impacts would be localized and within relatively disturbed areas, and restoration would increase the quality of habitat in the long term. Additionally, post-restoration, habitat for sensitive species would increase.

This section addresses project-related impacts, as well as benefits, to vegetation communities and plant and wildlife species that may occur during and after construction of the restoration project. Both direct and indirect impacts may occur during or within different project components, including restoration grading, haul routes and staging areas, channel improvements, beach placement, and periodic excavation of material from the river mouth. In addition to direct and indirect impacts, both temporary and permanent impacts would occur in the different vegetation communities for both alternatives.

Much of the BSA is historic wetlands that have converted over time through sediment accumulation during storm flows originating from Mexico. Vegetation communities within the BSA are characterized by relatively disturbed conditions and interspersed with nonnative species, with the exception of Model Marsh, which was recently restored. This impact analysis incorporates the quality of the vegetation communities and their ability to support sensitive species. Additionally, the BSA is a relatively arbitrary boundary defined to encompass the generalized construction footprint of TETRP II Phase I project components. It is important to note extensive vegetation communities are contiguous with the BSA, and impacts within the project limits do not necessarily reflect the availability of adjacent and contiguous areas within the remainder of the estuary or beach available to species both during and after construction of the project. Similarly, it should be noted that presence within the BSA does not equate to presence within the disturbance footprint of the project.

4.6.3.1 Restoration/Enhancement and Soil Management

Alternative 1

Restoration grading and channel enhancements would occur within the footprint identified in Figure 3-2. Temporary impact areas include the staging area and access routes, as well as the channel enhancement buffer area. Lastly, soil management options would involve transport of material to other project sites for beneficial reuse or a landfill along Monument Road through TRNERR, with Options 3 through 5 including shorter durations of truck transport and emphasizing beach nourishment using various volumes of suitable material. Trucking from the restoration site east through TRNERR and placement associated with beach nourishment during soil management and/or periodic excavation from the river mouth are also considered impacts with respect to species present along the road and at the beach, respectively.

Vegetation Communities

Short Term

Table 4.6-2 summarizes the potential impacts to vegetation communities associated with implementation of Alternative 1 and the proposed project of TETRP II Phase I. Restoration grading associated with Alternative 1 and the proposed project would impact primarily nonnative upland and transitional areas. Under Alternative 1, approximately 0.3 acre of transitional habitat and 0.2 acre of native upland habitat, located immediately adjacent to the northern boundary of the restoration footprint and situated between South Beach Slough and Old River Slough, would be avoided, while this area would be converted to wetlands under the proposed project. Also proposed under Alternative 1 is the conversion of 3.5 acres of transitional habitat located to the east of Model Marsh and south of Marsh Trail to coastal wetlands. This area would be avoided under the proposed project.

Table 4.6-2
Potential Impacts to Vegetation Communities (Acres)

Habitat Type	Alternative 1 – Restoration Grading (Permanent)	Proposed Project – Restoration Grading (Permanent)	Channel Enhancement (Permanent)[1]	Channel Enhancement (Temporary)[1]	Haul Routes and Staging (Temporary)[1]	Soil and River Mouth Management-Beach Nourishment (Temporary)[1]
Beach	-	-	0.0	0.0	-	24.6
Dune	-	-	0.2	0.2	-	-
High Marsh	0.2	0.2	0.6	0.7	-	-
Low Marsh	0.2	0.2	0.3	0.0	-	-
Mid Marsh	0.9	1.1	3.1	0.6	-	-
Mudflat	-	-	-	-	-	-
Nonnative Upland	14.4	14.3	-	-	0.0	-
Roads/Trail	2.8	2.8	-	-	0.1	0.0
Salt panne	8.7	9.0	-	-	1.1	-
Subtidal	0.1	0.2	2.4	0.2	-	-
Transitional	33.2	28.0	0.2	0.5	0.1	-
Native Upland	26.4	26.9	0.0	0.0	0.2	-
Total	**86.9**	**82.7**	**6.8**	**2.2**	**1.5**	**24.6**

[1] These impacts are the same across Alternative 1 and the proposed project.

Some impacts to disturbed salt panne would also occur under either alternative, as well as localized impacts to vegetated marsh and tidal channel areas within each of the proposed restoration footprints. As noted above, much of the upland and transitional area within the BSA has converted

from historic wetlands due to sedimentation during storm events, and remains relatively disturbed. As a result, these vegetation communities within the BSA do not support large numbers of sensitive species.

After restoration is complete, higher quality vegetation communities would replace these disturbed areas. Due to the low quality of the vegetation communities to be impacted and replaced with higher quality communities, and the relatively large area remaining outside of the BSA within the TRNERR**, impacts anticipated under Alternative 1 would be less than significant (CEQA Criterion B) and would not result in adverse effects to sensitive natural communities in accordance with CEQA. No significant impacts have been identified pursuant to NEPA.**

During soil management, sensitive beach or aquatic habitats, such as beach areas identified within the beach footprint, may be temporarily affected by turbidity. Prolonged turbidity could temporarily impede these communities and the species they support. As discussed in Section 4.3.3.2, as beach nourishment material is redistributed by the waves and finer-grained material is suspended in the water column and transported, turbidity would increase. However, the immediate area of waves actively breaking is typically turbid, and generally stormwater runoff from coastal rivers and streams adds freshwater that can cause large turbidity plumes up to several miles from shore before smaller-grained material settles out of the water column. The proposed project would place higher volumes of material compared to the Fate and Transport study, but placement would occur at rates slow enough to allow for potential surface turbidity to remain localized similar to the pilot study. As a result of the relatively slow and sporadic placement, similar impacts are anticipated with placement of material under the proposed project as were identified through the Fate and Transport study. In addition, Alternative 1 would avoid placement of sand within areas that contain native dune-building plant species. Therefore, the proposed project is not anticipated to significantly affect sensitive beach or aquatic habitats.

Channel enhancement would be focused within and adjacent to existing channels extending from the river mouth to the restoration site. Some impacts to encroaching vegetated marsh along the channel perimeters would occur, but is necessary to provide sufficient tidal exchange with the restoration areas to support proposed vegetation communities within the restoration footprint.

Temporary impacts associated with the staging area and access to the restoration sites, as well as temporary impacts associated with equipment access along the channel enhancement area, would primarily affect disturbed salt panne, as well as mid-high marsh and transitional vegetation communities. These areas would be restored to pre-construction conditions and/or better (e.g., planted with native species) after restoration is complete (PDF-12), and currently represent a small proportion of available habitat within the immediate area. **Therefore, temporary impacts would be less than significant under CEQA (CEQA Criterion B) and NEPA.**

Long Term

Post-restoration, vegetation communities within the BSA would reflect a salt marsh system with an increase of over 45 acres of vegetated marsh, as well as additional subtidal and mudflat. Upland, including nonnative upland, disturbed salt panne, and transitional vegetation communities, would be converted to salt marsh and mudflat, with intertidal channel connections, and the emphasis would be shifted to salt marsh compared to existing conditions. Restoration planting would include a native plant palette, and maintenance to control weeds and invasive species during native plant establishment would occur. **Alternative 1 would not result in the introduction of invasive species into the BSA (CEQA Criterion G); therefore, no impacts pursuant to CEQA or NEPA would occur.**

Jurisdictional Waters and Wetlands

A total of 20.5 acres of potential jurisdictional waters and wetlands would be impacted by Alternative 1 (Table 4.6-3). This includes up to 12.7 acres of beach that may be used for beach nourishment during soil management or periodic excavation of material from the river mouth. As noted above, this estimate is conservative, using a single parameter methodology, and therefore encompasses both potential state and federal jurisdictional areas.

Table 4.6-3
Potential Impacts to Waters of the U.S. and/or State

Potential Jurisdictional Waters of the U.S. and State	Community or Cover Type	Alternative 1 (acres)	Proposed Project (acres)
Wetland	Low Marsh	0.5	0.5
Wetland	Mid-High Marsh	4.8	5.0
Wetland	Mudflat	0	0
Other Waters	Subtidal	2.5	2.6
Beach (below the high tideline[1])	Beach	12.7	12.7
Total Estimated Impacts to Potential Jurisdictional Waters		**20.5**	**20.8**

[1] The acreage of impacts within the beach nourishment area is estimated to encompass 12.7 acres below the high tide line. Above the high tide line approximately 12.2 acres of beach would remain available within the footprint for nourishment. The acreage represented here also includes 0.06 acre of impacts associated with channel enhancements.

Post-restoration, no changes to beach condition would result. The beach is dynamic and the addition of material to the system below the high tide line would not impact the area of jurisdictional waters. Within the restoration grading footprint, jurisdictional acreage would increase to 75.2 acres, resulting in a net increase of 67.4 acres of potential jurisdictional waters and wetlands within the restoration grading footprint and providing an overall benefit to the estuary. **Alternative 1 would increase jurisdictional waters and wetlands and would not result**

in a substantial adverse effect on state or federally protected wetlands within the BSA or the estuary (CEQA Criterion C); therefore, impacts pursuant to CEQA would be less than significant and no significant impacts would occur pursuant to NEPA.

Sensitive Species

Flora

Within the BSA, no federally or state-listed plant species were identified. One nonlisted special-status species, Nuttall's acmispon, was observed within the BSA. This species is present within the barrier beach dune area within the southern portion of the BSA but is not located within the restoration grading or staging and access footprint. As part of soil management Options 3 through 5 and periodic removal of sand from the tidal river mouth, the beach placement footprint would avoid placement of sand within areas that contain native dune-building plant species. Since no sand nourishment would occur within areas of the beach and/or dune containing native dune-building plant species, no impact would occur to sensitive plant species during these activities.

Fauna

Non-Special -Status Species

Dredging or excavation within existing intertidal channels would temporarily impact macroinvertebrates located within the channel enhancement footprint, with minor impacts also located inside the restoration grading footprint, as identified in Table 4.6-2. The diversity of benthic macroinvertebrates within the estuary has decreased over time, particularly in areas of trans-border sewage flows within the BSA, although some macroinvertebrates continue to survive in areas that would be impacted as part of channel work. Some species of invertebrates are relatively mobile and would be expected to avoid equipment; however, overall, populations in areas with excavation would decrease immediately after excavation depending on the depth of soil removed. This decrease would be temporary and localized, and diversity is anticipated to increase over time with increased tidal flushing in the enhanced channels. Areas available to support invertebrates would also increase with restoration, due to the additional intertidal channel and mudflat areas established under Alternative 1.

Beach nourishment with material containing more than 75% sand, including river mouth excavation, is anticipated to be placed on the dry beach. Within the beach placement footprint direct burial of invertebrates would occur. Delivery of material using either trucks or a small dredge using a pipe would result in a relatively consistent placement of either thin layers or localized piles of sand. While some loss of invertebrates may occur, invertebrates are mobile and can move within the sand column. It is assumed the majority of invertebrates would be able to

move as needed, and populations within the remainder of the beach would remain unaffected and would recolonize the nourished beach relatively quickly. While a temporary depression in invertebrate availability at the surface may occur within these localized areas, invertebrates within the remaining beach area would not be affected and invertebrates are expected to be able to move to the surface within a short time. In addition, the Fate and Transport study conducted a Before-After Control-Impact study on the effects of the project on selected invertebrates and shorebird foraging, and the results of the monitoring indicated no effect on these resources (Everest International Consultants, Inc. 2017).

Impacts to fish could occur during channel enhancement; however, fish are mobile and are anticipated to avoid equipment. Habitat supporting fish does not currently exist within the restoration grading footprint; therefore, no impacts are anticipated. California grunion eggs laid on the beach between March and April have the potential to be affected by sand placement, construction activities, and vehicles if beach nourishment occurs during the spawning season. Beach nourishment activities would be restricted to outside the special-status bird breeding season, unless a qualified biologist, in coordination with CSP and Refuge managers, confirms no active nesting is occurring. If beach nourishment activities are scheduled during the grunion spawning period, a habitat suitability assessment and monitoring, as appropriate, for grunion spawning would occur prior to placement, as outlined in PDF-15. If a grunion run consisting of more than 100 fish is reported (i.e., >W-1 on the Walker Scale), the biologist would coordinate with the resource agencies to determine appropriate avoidance and minimization measures.

Insects and arthropods exist within the BSA in various vegetation communities, including low marsh, mid-marsh, and the barrier beach dunes. Impacts to insects and arthropods are not anticipated to be substantial due to minimal suitable habitat within the restoration grading footprint and channel enhancement area and availability of adjacent habitat for refugia. In addition, beach nourishment would be limited to areas of the barrier beach that do not contain native dune-building plant species. After restoration, additional habitat would be made available for increased populations and diversity.

Reptiles and amphibians are primarily located within the barrier dunes in the western portion of the BSA, where beach nourishment during soil management or periodic excavation of material from the tidal inlet may occur. During construction, reptiles and amphibians are generally anticipated to avoid equipment and utilize adjacent areas, although some individuals may seek cover within the site and/or under equipment. Beach nourishment would be limited to parts of the beach that do not contain native dune-building plant species. In particular, Baja California coachwhip and coast horned lizard are special-status species that may inhabit various parts of the BSA and restoration grading footprint. While there may be some impact to individuals within the direct grading footprint, impacts would be localized and adjacent suitable habitat would remain available through construction. Additionally, the project does not anticipate conditions that would

lead to entrapment; however, if pre-construction surveys indicate that entrapment could be an issue, the on-site restoration biologist would be available to monitor any areas of potential entrapment concern.

Birds within the BSA include a variety of species, including migratory birds utilizing the estuary as a stop along the Pacific Flyway. Construction would be scheduled outside of the special-status bird breeding season as feasible, but may continue during that time. Removal of vegetation would be limited to outside of the breeding season, and, prior to vegetation clearing, a pre-construction survey by a qualified biologist would be required as noted above in the project design features. During construction, indirect impacts to migratory birds due to degraded water quality in the channel enhancement area may occur. These activities may increase turbidity, resulting in lowered visibility. Turbidity would remain relatively localized, and most construction would be done with land-based equipment, with minimal grading within or adjacent to channels. Additionally, BMPs would be required as part of Alternative 1 implementation and would minimize turbidity and water quality impacts within existing channels.

Birds utilizing the beach nourishment area for foraging opportunities are not anticipated to substantially change, as lower availability of invertebrates would be localized and short term. As mentioned previously, the Before-After Control-Impact monitoring conducted as part of the Fate and Transport study indicated no effect to foraging shorebirds (Everest International Consultants, Inc. 2017). Additionally, because construction would be limited to outside the breeding season and/or after no active nesting has been confirmed in coordination with CSP and Refuge staff, sand nourishment activities on the beach are not anticipated to adversely affect nesting birds.

Indirect impacts to migratory birds may also occur due to noise during construction if it extends into the breeding season. Construction adjacent to habitat supporting special-status birds that may be nesting in proximity to the restoration footprint and/or beach nourishment envelope may interfere with the ability of species to breed. Earth-moving and/or dredge equipment would be used for Alternative 1 and typically involves bulldozers, excavators, dump trucks, front-end loaders, graders, and potentially a dredge. Noise generated by project construction would be temporary and vary dependent on the work phase, and equipment would require appropriate mufflers and housing. Removal of vegetation outside of the breeding season, as described in the project design features, would limit nesting and species occurrences within the site during noise-generating construction activities. During excavation and construction, noise generated by earth-moving equipment is mobile and would continually move throughout the site. The dynamic nature of the noise-generating construction equipment throughout the project site would limit the length of time a certain area is exposed to increased noise levels. Additionally, construction noise levels are typically not constant due to times when equipment is not functioning at full engine power, such as worker breaks, change in construction activities, and maintenance. Overall, noise would

increase in adjacent habitats supporting nesting birds, however. As such, adverse noise impacts on migratory bird species would occur and would be significant.

Mammals are widespread throughout the estuary, but are mobile and utilize areas inside and outside the BSA. No nonlisted special-status mammal species were detected during previous studies, but mammals are anticipated to utilize portions of the BSA. During construction, mammals are generally anticipated to avoid the footprint and utilize adjacent areas, although some individuals may seek cover within the site and/or under equipment. While some species may be temporarily displaced from the construction footprint during Alternative 1 implementation, the BSA does not represent the only area in which the non-special-status species above are located within the estuary. While there may be some impact to individual mammals within the direct grading footprint, impacts would be localized and adjacent suitable habitat would remain available through construction.

Indirect impacts due to noise would be significant to non-special-status species if construction continues through the breeding season pursuant to CEQA (CEQA Criterion A) and NEPA.

Federally Listed Species

Least Bell's Vireo

Least Bell's vireo habitat is not located within the BSA; therefore, direct and indirect impacts to the species associated with construction in the restoration grading footprint or during beach nourishment activities are not anticipated. Territories for the species have been mapped adjacent to the portion of Monument Road within TRNERR that is proposed as the material transport route under the various soil management options. Indirect impacts to least Bell's vireo may occur due to noise during construction if material is transported off-site to Nelson Sloan Quarry, other projects in the area, or the landfill during the breeding season. Dump trucks could raise noise levels to approximately 61 dBA, Community Noise Equivalent Level (CNEL) along the roadway (estimated at 30 feet from the edge of road), which could interfere with breeding activities occurring directly adjacent to the road (AECOM 2021d). Noise generated by trucks along the road would be temporary and vary dependent on the work phase.

Light-footed Ridgway's rail

During construction, up to 0.5 acre of low marsh, the preferred vegetation community for light-footed Ridgway's rail, would be directly impacted within the restoration grading footprint and channel enhancement area. Up to 4.6 additional acres of mid-marsh would also be directly affected during implementation of Alternative 1. Areas adjacent to the footprint and within the BSA may also support light-footed Ridgway's rail, including Model Marsh. During construction, traffic speeds adjacent to Ridgway's rail habitat would be maintained at 10 miles per hour (mph), and

areas may be fenced if it is determined necessary to reduce the ability of rails to enter active construction zones PDF-11.

As noted above for migratory birds, construction would be scheduled outside of the special-status bird breeding season as feasible, but may continue during that time. Removal of vegetation would be limited to outside of the breeding season, and prior to vegetation clearing a pre-construction survey by a qualified biologist would be required (PDF-9 and 10). If active nests are observed, a fenced buffer will be established. Additionally, construction activities will be limited in proximity of occupied nests until the nest is no longer active. Buffers will be established by the biological monitor to avoid impacts to nesting behavior and as determined through consultations with the USFWS and CDFW, as required. No project construction will occur within the fenced nest zone until the young have fledged, are no longer being fed by parents, have left the nest, and/or will no longer be impacted by the project.

Indirect impacts to light-footed Ridgway's rail may also occur due to noise during construction if it extends into the breeding season, as noted above for migratory birds. Construction adjacent to suitable nesting habitat such as Model Marsh may affect the species. Noise generated by project construction would be temporary and vary dependent on the work phase. Removal of vegetation outside of the breeding season, as described in PDF-9, would limit nesting and species occurrences within the site during noise-generating construction activities, but light-footed Ridgway's rail are known to be present in adjacent habitat areas. During excavation and construction, noise generated by earth-moving equipment is mobile and would continually move throughout the site. The dynamic nature of the noise-generating construction equipment throughout the project site would limit the length of time a certain area is exposed to increased noise levels. Additionally, construction noise levels are typically not constant due to times when equipment is not functioning at full engine power, such as worker breaks, change in construction activities, and maintenance. PDF-7 and 8 require equipment to have proper mufflers and enclose exposed dredge engines to minimize noise levels.

After construction, Alternative 1 would establish additional areas that could support light-footed Ridgway's rail, including 15.1 additional acres of low marsh and 30 additional acres of mid-high marsh. Additionally, 18 acres of mudflat would be established as part of Alternative 1, providing additional foraging opportunities for the species. Overall, the species would benefit from Alternative 1 implementation once restored habitats establish.

Western snowy plover

Within the BSA, the beach and sandy dunes provide breeding and foraging habitat for the western snowy plover. Beach nourishment as part of soil management and/or periodic excavation of material from the tidal inlet may occur within the beach and sandy dune area along the shoreline,

but no mudflats would be impacted as part of Alternative 1. Construction would be limited to outside the breeding season and/or when a qualified biologist has confirmed no active nesting is occurring (in coordination with CSP and Refuge managers) (PDF-9 and 10), although overwintering populations of snowy plover may continue to forage on the beach through the year. Outside the breeding season, snowy plover are mobile and are anticipated to avoid equipment on the beach. Traffic speeds would be maintained at less than 10 mph on the beach when placing or spreading material as well.

After construction is complete, the restoration area may provide additional foraging opportunities for snowy plover in 18 acres of mudflat established by Alternative 1. Beach nourishment activities would enhance sandy beach conditions for the breeding season and would provide an overall benefit to the species.

California least tern

During the breeding season, California least tern are present within the BSA, primarily nesting along the beach. The species is migratory, and construction would be limited to outside the breeding season and/or when a qualified biologist has confirmed no active nesting is occurring (in coordination with CSP and Refuge managers) (PDF-9 and 10).

In the long term, sand nourishment conducted as part of soil management and/or periodic excavation of material from the tidal inlet has the potential to enhance beach conditions for tern nesting.

State-Listed Species

Belding's Savannah sparrow

Historically, Belding's Savannah sparrow has been present within the BSA, although at lower concentrations than outside of the BSA in areas that would remain intact. While approximately 4.6 acres of mid-marsh would be impacted during implementation of Alternative 1, remaining adjacent habitat would be available both inside and outside of the BSA. As noted above, construction would be scheduled outside of the special-status bird breeding season as feasible, but may continue during that time. Removal of vegetation would be limited to outside of the breeding season, and, prior to vegetation clearing, a pre-construction survey by a qualified biologist would be required (PDFs-9 and 10). Indirect impacts to Belding's Savannah sparrow may also occur due to noise during construction if it extends into the breeding season, as noted above for light-footed Ridgway's rail.

After implementation of Alternative 1, there would be a net increase of 30 acres of mid- to high marsh that may be suitable to support Belding's Savannah sparrow. Mudflat increases of 18 acres

within the restoration footprint would also support additional foraging opportunities for the species, and an overall benefit is anticipated.

Nonlisted Special-Status Species

Insects

The restoration grading footprint and channel enhancement areas do not currently support expanses of salt grass, and no impact is anticipated to wandering skipper. After restoration is complete, additional areas of vegetated marsh would be available to the species.

Reptiles and Amphibians

The Baja California coachwhip may exist within the BSA in coastal sand dunes along the barrier beach. The coast horned lizard may utilize the barrier beach as well as other coastal salt marsh areas within the BSA. While these species are mobile and generally anticipated to avoid equipment, there may be some impact to individuals within the direct grading footprint. However, impacts would be localized and adjacent suitable habitat would remain available through construction.

Birds

The northern harrier is located within the BSA and could utilize areas within the restoration grading footprint; however, foraging areas would remain available to the species through construction.

Indirect impacts due to noise would be significant to federally and state-listed special-status bird species if construction continues through the breeding season, representing a significant impact pursuant to CEQA (CEQA Criterion A) and NEPA.

Wildlife Movement

The BSA provides for localized wildlife movement and is a critical part of the larger area of habitat Tijuana Estuary provides for core populations of sensitive species. The BSA is a small portion of the estuary and beach, and is contiguous with existing habitat areas, allowing movement around active construction areas to continue during restoration. PDF-6 requires defined construction areas that would limit the extent of construction activities. After completion of construction, movement through the area would be restored or enhanced compared to pre-restoration conditions due to enhanced habitat connectivity and quality. **Alternative 1 would not interfere substantially with the movement of 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, and no impact to wildlife movement would occur (CEQA Criterion D); therefore, no significant effects to movement of fish or wildlife species have been identified pursuant to CEQA or NEPA.

Local Ordinances/Policies/Adopted Plans

There are multiple jurisdictions and entities with biological resource management plans and polices throughout Tijuana Estuary and the project site. The various federal, state, and local designations and authorities create an overlapping network related to biological resource protection and conservation, with various regulations applying to the BSA as listed at the beginning of this section.

Tijuana Estuary and the project site are generally identified in applicable planning documents as an area to be preserved and protected as open space with specific policies and goals related to estuary function and conservation. Restoration and enhancement activities would not alter the estuary's current biological value, habitats, or function in a manner inconsistent with applicable biological resource protection regulations and policies. Restoration, maintenance, and monitoring efforts for Alternative 1 would be prepared in accordance with the goals of applicable biological resource plans and policies, and in consultation with the wildlife agencies. The potential temporary impact on sensitive habitats is necessary and unavoidable in the process to modify elevations and replace lower quality habitat with higher value and functioning estuary habitats to achieve the restoration and enhancement habitat goals. Alternative 1 would be consistent with the applicable goals and policies related to the maintenance and preservation of open space lands and the protection and enhancement of sensitive ecological and natural resources and has been designed to comply with the applicable restrictions and requirements related to biological resources. **No conflict with local policies or ordinances protecting biological resources (CEQA Criterion E) would occur; therefore, no impacts related to policies, ordinances, and plans for protecting biological resources would occur pursuant to CEQA or NEPA.**

As noted in Section 2.4, the City of San Diego's MHPA and MSCP requirements and guidelines are applicable to City-owned land, but do not apply to state or federally owned lands, including the project site. MHPA requirements are considered by CSP and applied as appropriate within Border Field State Park but are not planning requirements. The overarching goal of the MSCP is to maintain and enhance biological diversity in the region and conserve viable populations of endangered, threatened, and key sensitive species and their habitats. As Alternative 1 is a restoration project and would restore estuarine habitats, riparian corridors, and other sensitive natural communities and habitat for wildlife, Alternative 1, while not under jurisdiction of the MHPA, would be consistent with the goals and objectives of the MHPA and would not conflict with the provisions of the MSCP. **No conflict with the provisions of an adopted habitat**

conservation plan (CEQA Criterion F) would occur; therefore, no significant biological impacts related to conservation planning would occur pursuant to CEQA or NEPA.

Critical Habitat and Essential Fish Habitat

Critical habitat for western snowy plover has been designated within the BSA, and PCEs are present in the sandy barrier beach and dune habitats as noted in Section 4.6.1. Alternative 1 would potentially include sand nourishment on the sandy barrier beach as part of soil management and/or periodic excavation of material from the river mouth. Nourishment would involve sand placement on areas of the beach that do not contain native dune-building species and construction would be limited to times when no active nesting is occurring within the beach placement footprint. When no active nesting is occurring, placement occurring as part of nourishment on the dry beach where plover may be foraging would be localized, with remaining beach areas kept open for use. After placement activities are completed, PCEs would remain similar to existing conditions; therefore, no permanent loss or substantial degradation would occur to designated critical habitat, and no impact would occur.

Construction of Alternative 1 would result in temporary and short-term impacts to EFH associated with grading and/or dredging operations in the channel enhancement area, as well as beach placement footprint (e.g., excavation, turbidity, sediment disruption). Channel excavation and beach nourishment would be localized, retaining adjacent areas to act as refugia during construction. In addition, the estuary and beach do not support rocky reefs or eelgrass habitat; therefore, construction impacts would only occur to soft-bottom habitat, which is known to recover quickly. **A permanent loss or substantial degradation of Critical Habitat and/or EFH would not occur due to implementation of Alternative 1 and no substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS would occur (CEQA Criterion B). Therefore, no related biological impacts pursuant to CEQA or NEPA are anticipated.**

Proposed Project

Restoration grading would occur within the footprint identified in Figure 3-4. Similar to Alternative 1, temporary impact areas include the staging area and access routes, as well as the channel enhancement buffer area. Lastly soil management options would involve transport of material to other project sites for beneficial reuse or a landfill along Monument Road through TRNERR, with Options 3 through 5 including shorter durations of truck transport and emphasizing beach nourishment using various volumes of suitable material. Trucking from the restoration site east through TRNERR and placement associated with beach nourishment during soil management and/or periodic inlet excavation are also considered impacts with respect to species present along the road and at the beach, respectively.

Vegetation Communities

Short Term

The proposed project would have a restoration grading footprint similar to Alternative 1, as shown in Figure 3-4, although the restoration grading under the proposed project would be slightly refined to avoid relatively higher quality areas of transitional and upland within the BSA, including 3.5 acres located to the east of Model Marsh and south of Marsh Trail. Two additional areas of transitional habitat, totally approximately 1.1 acres, would be avoided within the northern portion of the restoration footprint. These areas would be restored to wetlands under Alternative 1. Alternative 1 proposed to avoid approximately 0.5 acre of native upland and transitional habitat immediately to the north of the restoration footprint, areas that would be restored to wetlands under the proposed project.

Overall, impacts would primarily occur within upland (including nonnative upland) and transitional areas, although at slightly lower total areas than Alternative 1. Impact areas are summarized in Table 4.6-2. The analysis provided under Alternative 1 also applies to the proposed project. **Impacts to sensitive natural communities (CEQA Criterion B) would be less than significant pursuant to CEQA and NEPA.**

Long Term

Similar to Alternative 1, post-restoration vegetation communities within the BSA would reflect a salt marsh system, with an increase of approximately 51 acres of vegetated marsh, as well as additional intertidal channels and mudflat. Upland, including nonnative upland, disturbed salt panne, and transitional vegetation communities would be converted to salt marsh and mudflat, with intertidal channel connections, and the emphasis would be shifted to salt marsh compared to existing conditions. Restoration planting would include a native plant palette, and maintenance to control weeds and invasive species during native plant establishment would occur. **The project would not result in the introduction of invasive species into the BSA (CEQA Criterion G) and no impacts pursuant to CEQA or NEPA would occur.**

Jurisdictional Waters and Wetlands

A total of 20.8 acres of potential jurisdictional waters and wetlands would be impacted by the proposed project (Table 4.6-3). Similar to Alternative 1, this includes up to 12.7 acres of beach that may be used for beach nourishment during soil management or periodic excavation of material

from the tidal inlet. As noted above, this estimate is conservative, using a single parameter methodology, and therefore encompasses both potential state and federal jurisdictional areas.

Post-restoration, no changes to beach condition would result. The beach is dynamic and the addition of material to the system under the high tide line would not impact wetland areas. Within the restoration grading footprint, potential jurisdictional acreage would increase to 67.9 acres, resulting in a net increase of 59.8 acres of potential jurisdictional waters and wetlands within the restoration grading footprint and providing an overall benefit to the estuary. **The project would increase jurisdictional waters and wetlands and would not result in a permanent loss of wetlands or reduce aquatic functions and values within the BSA or the estuary. Impacts under CEQA (CEQA Criterion C) and NEPA would be less than significant.**

Sensitive Species

The proposed project would create similar impacts to both flora and fauna as Alternative 1.

Flora

Similar to Alternative 1, no sand nourishment would occur within areas of the beach and/or dune containing native dune-building plant species as part of soil management options that include beach nourishment or periodic excavation or sand from the tidal inlet; therefore, **no impact pursuant to CEQA (CEQA Criterion A) or NEPA would occur to sensitive plant species.**

Fauna

Non-Special-Status Species

Under the proposed project, impacts to non-special-status species would be similar to Alternative 1. **Indirect noise impacts to migratory birds would be significant pursuant to both CEQA (CEQA Criterion A) and NEPA if construction occurs during the breeding season.**

Federally Listed Species

Least Bell's Vireo

As noted under Alternative 1, least Bell's vireo habitat is not located within the BSA; therefore, direct and indirect impacts to the species associated with construction in the restoration grading footprint or during beach nourishment activities are generally not anticipated. Noise impacts associated with truck trips transporting excavated soil from the site and construction in the

southeast corner of the restoration area have the potential to significantly impact adjacent nesting birds if construction occurs during the breeding season.

Light-footed Ridgway's rail

During construction of the proposed project, up to 0.5 acre of low marsh, the preferred vegetation community for light-footed Ridgway's rail, would be directly impacted within the restoration grading footprint and channel enhancement area. Up to 4.8 additional acres of mid-marsh would also be directly affected during implementation of this alternative, a slight increase over Alternative 1. As noted under the analysis for Alternative 1, areas adjacent to the footprint and within the BSA may also support light-footed Ridgway's rail, including Model Marsh. During vegetation clearing in suitable habitat, biologists would be on-site to clear the area ahead of equipment (PDF-10). During construction, traffic speeds adjacent to Ridgway's rail habitat would be maintained at 10 mph, and areas may be fenced if it is determined necessary to reduce the ability of rails to enter active construction zones.

While construction would be scheduled outside of the special-status bird breeding season as feasible, it may continue through the year. Removal of vegetation would be limited to outside of the breeding season, and, prior to vegetation clearing, a pre-construction survey by a qualified biologist would be required as identified above in the project design features (PDF-9 and 10). Despite these measures, indirect impacts to light-footed Ridgway's rail may occur due to noise during construction if it extends into the breeding season, as noted above under Alternative 1.

After construction, the proposed project would establish additional areas that could support light-footed Ridgway's rail, including 22.4 additional acres of low marsh and 28.5 additional acres of mid-high marsh. Similar to Alternative 1, 6.4 acres of additional mudflat would be established as part of the project, providing additional foraging opportunities for the species. Overall, the species would benefit from project implementation.

Western snowy plover

Within the BSA, the beach and sandy dunes provide breeding and foraging habitat for the western snowy plover. Beach nourishment as part of soil management and/or periodic excavation of material from the tidal inlet may occur within the beach and sandy dune area along the shoreline; however, similar to Alternative 1, no mudflats would be impacted as part of the proposed project implementation.

After construction is complete, the restoration area may provide additional foraging opportunities for snowy plover in 6.4 acres of mudflat established by the proposed project. Beach nourishment

activities would enhance sandy beach conditions for the breeding season and would provide an overall benefit to the species.

California least tern

Similar to Alternative 1, during the breeding season, California least tern primarily nest along the beach within the BSA. The species is migratory, and construction would be limited to outside the breeding season and/or when a qualified biologist has confirmed no active nesting is occurring (in coordination with CSP and Refuge managers) (PDF-9 and 10).

In the long term, sand nourishment conducted as part of soil management and/or periodic excavation of material from the tidal inlet has the potential to enhance beach conditions for tern nesting.

State-Listed Species

Belding's Savannah sparrow

As noted for Alternative 1, the preferred habitat for Belding's Savannah sparrow is pickleweed-dominated coastal salt marsh associations, although it also utilizes mudflats and beaches for foraging. Historically, the species has been present within the BSA, although at lower concentrations than outside of the BSA in areas that would remain intact. While approximately 4.8 acres of mid-marsh would be impacted during implementation of the project, remaining adjacent habitat would be available both inside and outside of the BSA and impacts due to habitat impacts would be less than significant.

Project design features would be implemented as described under Alternative 1, but indirect impacts to Belding's Savannah sparrow may also occur due to noise if construction extends into the breeding season.

After implementation of the proposed project, there would be a net increase of 28.5 acres of mid- to high marsh that may be suitable to support Belding's Savannah sparrow. Mudflat increases of 6.4 acres within the restoration footprint would also support additional foraging opportunities for the species, and an overall benefit is anticipated.

Nonlisted Special-Status Species

Under the proposed project, impacts to nonlisted special-status species would be similar to Alternative 1. Less than significant impacts to insects, reptiles and amphibians, and birds are anticipated, and long-term benefits would occur.

Similar to Alternative 1, adverse noise impacts to federally and state-listed special-status bird species could occur, and impacts would be significant pursuant to CEQA (CEQA Criterion A) and NEPA.

Wildlife Movement

Similar to discussion under Alternative 1, the BSA provides for localized wildlife movement, represents a small portion of the estuary and beach, and is contiguous with existing habitat areas. Wildlife movement around active construction areas would continue during restoration, and after completion of construction, movement through the area would continue. **No impact to wildlife movement, as evaluated pursuant to CEQA (CEQA Criterion D) and NEPA, is anticipated due to implementation of the proposed project.**

Local Ordinances/Policies/Adopted Plans

Similar to the discussion under Alternative 1, the proposed project would also comply with local ordinances, plans, and policies applicable to the project site that have been adopted for the protection of biological resources. As the proposed project is a restoration project and would restore estuary habitats, enhance riparian corridors, and increase the quality of other sensitive natural communities and habitat for wildlife, **no conflict with biological resource protection plans would occur due to implementation of the proposed project, and no impact pursuant to CEQA (CEQA Criterion F) or NEPA would occur.**

Critical Habitat and Essential Fish Habitat

Soil management and periodic excavation of material from the tidal inlet under the proposed project would be the same as discussed under Alternative 1.

Construction of the proposed project would be similar to Alternative 1 and would result in temporary and short-term impacts to EFH associated with grading and/or dredging operations in the channel enhancement area, as well as beach nourishment envelope (e.g., excavation, turbidity, sediment disruption). Construction impacts would only occur to soft-bottom habitat and adjacent areas would remain available as refugia during construction; **therefore, short-term impacts to**

EFH (CEQA Criterion B) are considered less than significant, and no impact would occur to critical habitat pursuant to CEQA and NEPA.

No Project/No Action Alternative

Under the No Project Alternative, no restoration grading or channel enhancement would occur within Tijuana Estuary. Periodic removal of sand from the river mouth could continue to occur under separate approvals, but beach nourishment associated with soil management of excavated soils from the restoration grading footprint would not be completed.

Vegetation Communities

No impacts to sensitive vegetation communities would occur under the No Project Alternative. There is the potential for continued conversion of areas subject to recent sedimentation to disturbed upland vegetation communities, but much of the area currently converting is disturbed and is not considered sensitive. **Therefore, no impacts to sensitive vegetation communities would occur pursuant to CEQA (CEQA Criterion B) or NEPA.**

Jurisdictional Waters and Wetlands

Under the No Project Alternative, no construction would occur, and **no impacts to existing jurisdictional waters pursuant to CEQA (CEQA Criterion C) or NEPA would result.** Additionally, no increase in overall jurisdictional waters or wetlands would be realized.

Sensitive Species

Under the No Project Alternative, no construction would occur to restore the area around Model Marsh within Tijuana Estuary. **No impacts to rare, threatened, or endangered animal species would occur pursuant to CEQA (CEQA Criterion A) or NEPA, although the benefits associated with proposed restoration under TETRP II Phase 1 would not be realized, and disturbed vegetation cover would continue to dominate the site.**

Wildlife Movement

No construction would occur under the No Project Alternative; therefore, **no impact to current wildlife movement through the BSA would occur pursuant to CEQA (CEQA Criterion D) or NEPA.**

Local Ordinances/Policies/Adopted Plans

The No Project Alternative would maintain the existing condition of the BSA and would not require construction in Tijuana Estuary. While the natural communities of Tijuana Estuary would continue to provide open space within TRNERR, increased functions and values of the site would not occur as proposed under TETRP II Phase I. **The No Project Alternative would be consistent with local plans and policies (CEQA Criteria E and F), and no impact would occur pursuant to CEQA or NEPA.**

4.6.4 Avoidance, Minimization, and Mitigation Measures

The proposed project is designed to enhance the restoration site and contribute to the ecological function of Tijuana Estuary. Although impacts would occur as identified in the Impact Analysis, they would increase the overall habitat value of the site and increase wetlands within Tijuana Estuary as a whole. Habitat conversion as part of the proposed project would be focused on nonnative and disturbed native upland and transitional, and would be intentionally completed to increase higher value/functioning habitat at the expense of lower quality habitat currently existing on-site. Many of the impacts would also be temporary as a result of construction or less than significant, and due to the nature of the project, an effort has been made to proactively incorporate PDFs to limit impacts to resources whenever possible. Mitigation measures to reduce temporary significant impacts to biological resources were considered and found potentially infeasible as described below. Temporary impacts to migratory and federally and state-listed bird species would remain significant and unavoidable under CEQA and significant under NEPA.

Significant adverse biological impacts identified for the proposed project are temporary and a result of noise associated with construction if it occurs during the breeding season. PDFs have been included in the project to minimize construction equipment noise (PDF-7 and 8). Mitigation measures, including noise walls and restriction of construction activities to outside the breeding season, were considered to further reduce adverse indirect noise impacts, which would occur during initial project construction activities, including restoration grading, channel enhancement, and soil management (trucking along Monument Road within TRNERR). In a typical construction project, temporary noise walls are often required as mitigation, and are constructed between the construction site and adjacent habitat. These walls are typically 6 feet high and constructed of plywood with strong footings to support the wall over the life of construction. This physical buffer can lower noise levels to below a level of significance.

Within the restoration grading and channel enhancement footprint, equipment would be moving through the BSA throughout construction, and the habitat of concern includes adjacent marsh. An intervening noise wall within the restoration grading footprint would have to be continually mobile or constructed in unstable soil conditions along the wetland and/or channel edge. Construction of

walls with either sufficient mobility or footings in a vegetated wet environment and strength to persist for the duration of the project would result in direct impacts to adjacent habitat. The impacts associated with construction of the noise walls and the introduced barrier would reduce or eliminate the value of this mitigation measure. Noise walls are considered an infeasible mitigation measure, and temporary indirect noise impacts remain significant and unmitigated under CEQA and NEPA.

Similarly, noise impacts to adjacent nesting least Bell's vireo could occur along Monument Road within TRNERR if trucking associated with soil management occurs during the breeding season. It may be feasible to construct temporary noise walls along the roadway if work extends into the breeding season, but this would be dependent on the specific location of territories and conditions along the specific segment of Monument Road. For example, construction of a noise wall would require adequate area for the structure, and adequate shoulder/roadway width or availability of adjacent disturbed area may not exist. Additionally, noise walls may restrict movement of other species across the road depending on other adjacent habitat types. Upon determination of the need to construct during the breeding season, a detailed feasibility analysis of noise wall construction would be conducted. Since the project cannot commit to construction of a noise wall that would adequately reduce noise levels of trucking during the breeding season, and the measure may be found infeasible, temporary indirect noise impacts remain significant and unavoidable under CEQA, and significant under NEPA.

While proposed project construction would be scheduled outside of the breeding season as feasible, there may be work that extends through the breeding season depending on construction needs. Project construction may therefore be allowed to continue through the breeding season. A project schedule requiring work to be completely conducted outside of the bird nesting season was considered. This would completely halt construction between February 15 and September 1. Depending on the start date for construction, the stop and start schedule could extend the overall construction duration substantially and the longer construction period could result in additional time of disruption to birds. A longer duration would potentially result in greater impacts than temporary construction noise during the breeding season, in part because the construction equipment would be mobile and only a portion of nesting habitat would be within the range of the construction noise at a given time. While the schedule would focus activities outside the breeding season as feasible, a mitigation measure requiring work to occur completely outside of the nesting season was determined infeasible.

4.7 GEOLOGY/SOILS

The project study area is located within the Coastal Plain region of the Peninsular Ranges Geomorphic Province, which is characterized by a series of mountain ranges separated by northwest-trending valleys. The proposed project would include habitat restoration activities at the project site, maintaining an open river mouth, and nourishment at beach locations. As such, the project study area includes the estuary and nearby beach area, as described below. Information referenced within this section includes the Sampling and Analysis Report and Construction Methods Report prepared for the proposed project (Bodhi 2021; Anchor QEA 2021a).

4.7.1 Affected Environment

Regulatory Setting

The following laws, regulations, policies, and plans are applicable to this resource area:

- U.S. Geological Survey Landslide Hazard Program
- Alquist-Priolo Earthquake Fault Zoning Act
- Building Codes
- Construction General Permit
- Seismic Hazards Mapping Act of 1990

Geologic Setting

The principal geological formations prevailing in the estuary are quaternary and recent alluvial and slopewash deposits reaching depths of 130 feet. Sandstones, shales, and limestones underlie the unconsolidated deposits. Recent beach sand deposits occur along the shoreward length of the estuary. The lower valley is bound to the north, east, and south by sandstone and conglomerates that account for the mesa topography. The mudflats at the mouth and lower parts of the estuary are occasionally covered by sands transported during storms from the beach. The saline Chino silt loams, considered highly erodible but suitable for agriculture, occur upstream from the flats. To the south, the fine sandy loams blanketing the mesas and terraces are also considered highly erodible and are contributing substantially to downstream sedimentation. Marsh loss due to the massive sediment loads represents one of the major threats to the health of the estuary.

Characterization of Soils

The project site has been heavily impacted by human land use activities. For example, the channels of the southern estuary have been filled with sediment from Goat Canyon and other sources and have lost much of their tidal prism. Areas that were formerly seasonal wetlands and salt pannes have been buried by sediment, and are now succeeding to disturbed upland habitats. As discussed

in Section 4.5, Hazardous Materials and Public Safety, a detailed soil collection and analysis occurred within the project site in March 2021 (Bodhi 2021). The study evaluated both chemical soil characteristics as discussed in Section 4.5, Hazardous Materials and Public Safety as well as physical soil characteristics. The study physically characterized soils within the project site as follows: 47% silt (ML), clay (CL) or a mixture of silt and clay (CL-ML), 28% silty sand (SM) or clayey sand (SC), and 25% sand (SP or SP-SM).

Faulting and Seismicity

The southern California region is a seismically active area with a large number of known faults traversing the region. However, no active faults are known to underlie the project site that could cause the potential for ground rupture. The project site is not located within a Fault-Rupture Hazard Zone or the Alquist-Priolo Earthquake Study Zone, as delineated by the California Geological Survey under the Alquist-Priolo Earthquake Fault Zoning Act (California Department of Conservation 2000).

Liquefaction

Liquefaction occurs primarily in saturated, loose, fine- to medium-grained soils in areas where the groundwater table is generally 50 feet or less below the surface. When these sediments are shaken during an earthquake, a sudden increase in pore water pressure causes the soils to lose strength and behave as a liquid. The project site is located within an area identified by the County as having a potential liquefaction risk (SANDAG 2007).

4.7.2 CEQA Thresholds of Significance

Would the project:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of 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; or
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

4.7.3 Environmental Evaluation

The 1991 TETRP EIR/EIS found that the implementation of Model Marsh would not result in geological impacts. However, it concluded that implementation of the 496-acre restoration project could result in potentially significant long-term impacts to topography with construction of an erodible berm or levee at 25 feet and 10 feet from the ground surface elevation, respectively. Since TETRP II Phase I evaluated in this tiered document is not proposing such contours, the potentially significant impact identified in the 1991 TETRP EIR/EIS would not result with implementation of TETRP II Phase I.

4.7.3.1 Restoration/Enhancement

The project site is not within a Fault-Rupture Hazard Zone or the Alquist-Priolo Earthquake Study Zone (California Department of Conservation 2000). Additionally, no active faults that could cause the potential for ground rupture are known to underlie the project site. Restoration and enhancement of the project site would not result in an increased risk to people or structures from fault rupture nor increase the potential for fault rupture to occur. **Therefore, impacts related to fault rupture would be less than significant under each of the alternatives, and no significant impacts have been identified pursuant to CEQA (CEQA Criterion A [i]) or NEPA.**

Alternative 1

The project site is located within the seismically active southern California region and is subject to strong seismic ground shaking. Alternative 1 would not increase the potential for seismic activity to occur on or near the project site, and built structures are not proposed nor are they located near the project site. Fault rupture on the project site is not considered likely as there are no known active faults that cross the site.

As previously discussed, the project site is located in an area identified as being susceptible to liquefaction. Since Alternative 1 does not include construction of new structures and is not located near existing structures, Alternative 1 would not increase the risks associated with liquefaction.

Project-related ground disturbance under Alternative 1 would occur during excavation and dredging activities within portions of the estuary that are generally underlain by alluvial deposits and are generally flat. Alternative 1 would not remove or disturb substantial slopes or other ground

supporting features that could create unstable geologic conditions and would not have the potential to induce or increase the risk of landslides. **Therefore, impacts resulting from strong seismic ground shaking, liquefaction, and landslides would be less than significant under Alternative 1 pursuant to CEQA (CEQA Criterion A [ii, iii, iv]), and no significant impacts have been identified pursuant to NEPA.**

Erosion control from construction activities would be addressed in the SWPPP prepared for Alternative 1. The SWPPP would include BMPs to minimize scour and impacts on surface drainage patterns, and would be developed and implemented by the contractor in compliance with existing regulations. Potential BMPs would include the use of erosion control products and/or vegetated material to minimize erosion or scour potential by protecting susceptible soil. These BMPs would be implemented on manufactured slopes included as part of project design to minimize erosion of slopes both temporarily and in the long term through revegetation with appropriate native vegetation. Over the long term, erosion could occur in and around the channels during large storm events under Alternative 1. However, areas identified as having the potential for erosion, such as within channel cross sections, would be protected with erosion control measures and would generally be vegetated. Thus, no substantial long-term erosion would result from implementation of Alternative 1. **Therefore, neither construction nor long-term maintenance under Alternative 1 would result in substantial soil erosion or loss of topsoil, and impacts would be less than significant under CEQA (CEQA Criterion B) and NEPA.**

Slopes are susceptible to the impacts of liquefaction and lateral spreading and may become unstable during a substantial seismic event. Impacts related to liquefaction and landslides are discussed above; therefore, this discussion focuses on potential impacts related to slope stability and lateral spreading. Restoration activities under Alternative 1 would require removal of approximately 585,000 cy of soil. Manufactured slopes along the edges of wetland and transitional habitats would be properly engineered and designed to maintain geologic stability. Lateral spreading may occur with construction of intertidal channels and improvements to existing tidal connections; however, scour would naturally occur until the system reaches equilibrium as part of the natural, dynamic processes of an estuary. Overall, ground alteration would occur within the generally flat portions of the estuary floor, and instability throughout the project site would be similar to existing conditions and would not pose an increased risk of slope instability**. Alternative 1 would not create geologic conditions or build structures or other features that would be at risk or put people at risk from geologic instability; therefore, impacts related to hazards as a result of geologic instability under Alternative 1 would be less than significant under CEQA (CEQA Criterion C), and no significant impacts related to geological instability have been identified pursuant to NEPA.**

Expansive soils are clay-based soils that tend to expand (increase in volume) as they absorb water and shrink (lessen in volume) as water is drawn away. While such soils exist within the project

site, grading and excavation activities under Alternative 1 would not increase the risk from expansive soils. **Therefore, Alternative 1 would not result in impacts from expansive soils pursuant to CEQA (CEQA Criterion D) or NEPA.**

No septic tanks or alternative waste disposal systems are required or proposed for construction as part of Alternative 1. **Therefore, no related impacts would occur under Alternative 1 pursuant to CEQA (CEQA Criterion E) or NEPA.**

Proposed Project

The proposed project would include similar excavation activities to Alternative 1 with slightly less excavation required to achieve the proposed habitat distribution (approximately 521,000 cy). Thus, discussions and conclusions identified under Alternative 1 are also applicable to the proposed project. **Therefore, impacts resulting from strong seismic ground shaking, liquefaction, and landslides would be less than significant under the proposed project pursuant to both CEQA (CEQA Criterion A [ii, iii, iv]) and NEPA.**

Similar to Alternative 1, erosion control from construction activities under the proposed project would be addressed in the SWPPP prepared for the proposed project. **Therefore, neither construction nor long-term maintenance under the proposed project would result in substantial soil erosion or loss of topsoil. Therefore, impacts would be less than significant pursuant to CEQA (CEQA Criterion B), and no significant impacts related to soil erosion have been identified pursuant to NEPA.**

The proposed project would include similar excavation activities to Alternative 1 with slightly less excavation quantities proposed to achieve the desired habitat elevations. **Thus, the proposed project would not create geologic conditions or build structures or other features that would be at risk or put people at risk from geologic instability; therefore, impacts would be less than significant pursuant to CEQA (CEQA Criterion C), and no related significant effects have been identified pursuant to NEPA.**

As described for Alternative 1, the soils in the vicinity of the project site are not considered to be expansive. **Thus, no impact related to expansive soils would occur pursuant to CEQA (CEQA Criteria D and E) or NEPA.**

No Project/No Action Alternative

Under the No Project/No Action Alternative, the proposed restoration of the estuary would not be completed and construction activities that may increase the risks related to geology and soils would not occur. Under the No Project/No Action Alternative, the project site would be subject to the

same seismic phenomena as existing conditions, and would not increase risks associated with such phenomena. **Therefore, no impacts to geology and soils pursuant to CEQA (CEQA Criteria A through E) or NEPA would occur under the No Project/No Action Alternative.**

4.7.3.2 Soil Management

Beach nourishment areas are not located over an earthquake fault nor are they within an Alquist-Priolo Earthquake Fault Zone. No structures would be constructed during on-site or off-site soil management options, and proposed soil management would not increase the potential for seismic activity or resulting geologic hazards. Activities associated with beach and swash zone placement may create sloping terrain to accommodate placement needs but would not create or modify steep slopes that would be susceptible to landslides or increase the risk for soil instability. Nourishment would supplement existing beach and natural processes would integrate material into the gradually sloped topography of the beach. Beach nourishment would not increase risks associated with seismic ground shaking, liquefaction, lateral spreading, landslides, or soil stability. Design of nourishment would be required to adhere to applicable codes and regulations relative to seismic safety and erosion. **Therefore, a less than significant impact related to geologic hazards would result pursuant to CEQA (CEQA Criteria A and C), and no significant effects would occur pursuant to NEPA.**

Excavated materials may have the potential to expand at the beach nourishment site once exposed to moisture from the ocean. Expansion and shrinkage of materials would not pose a geologic risk as the beach and nearshore areas are subjected to regular wetting and drying as tides change throughout the day. **Therefore, soil management would not result in significant impacts related to expansive soils pursuant to CEQA (CEQA Criterion D) or NEPA.**

The proposed project does not include construction of septic tanks or alternative waste disposal systems. **Therefore, no impacts would occur pursuant to CEQA (CEQA Criterion E) or NEPA.**

4.7.4 <u>Avoidance, Minimization, and Mitigation Measures</u>

Impacts to geology and soils as a result of Alternative 1 and the proposed project are less than significant. No significant impacts to geology and soils have been identified; therefore, no mitigation measures are required.

4.8 CULTURAL RESOURCES

Cultural resources consist of sites, buildings, structures, objects, and districts or other places of human activity that are considered significant to a community, culture, or ethnic group. These resources may be historic or prehistoric in age, or a combination of both. The cultural study area refers to the entire boundary of TRNERR. The proposed project area of potential effects (APE) is the extent of physical disturbance for the undertaking as shown in Figures 3-2 and 3-4 for Alternative 1 and the proposed project, respectively. The Regional Prehistory and History section below is based primarily on information from the Cultural Resources Technical Report (ASM 2021a).

4.8.1 Affected Environment

Regulatory Setting

Requirements for federal agencies to identify, evaluate, and protect cultural resources are outlined in several federal regulations, including the NHPA, the Antiquities Act of 1906, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990. The requirement for consultation with Tribal Governments is addressed in the presidential "Memorandum on Government-to Government Relations with Native American Tribal Governments" (April 29, 1994), EO 13175 (2000) Consultation with Indian Tribal Governments, and USFWS Native American Policy (510 FW1). The USFWS policy provides a framework for government-to-government relationships, which furthers the United States' and the Department of the Interior's trust responsibility to federally recognized Tribes to protect, conserve, and use Tribal reserved, treaty guaranteed, or statutorily identified resources.

The NHPA (16 U.S.C. 470 *et seq.*) establishes the nation's policy for historic preservation and sets in place a program for the preservation of historic properties by requiring federal agencies to consider effects to significant cultural resources (e.g., historic properties) prior to undertakings. The NHPA established the National Register of Historic Places (NRHP) and the President's Advisory Council on Historic Preservation, and provided that states may establish State Historic Preservation Offices to carry out some of the functions of the NHPA. Most significantly, the NHPA established that federal agencies be responsible for managing cultural resources. Section 106 of the NHPA directs that federal agencies take into account the effect of an undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP. Further, it defines the steps necessary to identify historic properties, including consultation with federally recognized Native American Tribes to identify resources with important cultural values; to determine whether they may be adversely affected by a proposed undertaking; and to outline the process for eliminating, reducing, or mitigating adverse effects.

EO 13175 firmly establishes the policy for regular and meaningful consultation with Tribes, directing each Agency to develop a consultation process. Executive Memorandum, Government-to-Government Relationship with Tribal Governments, (September 2004), recognizes the unique legal and political relationship of Tribes, and reaffirms that each executive department and Agency fully respect the rights of self-government and self-determination in their working relationships with federally recognized Tribal governments.

The following California laws and regulations are also applicable to this resource area:

- California Code of Regulations; Title 14, Section 4308
- California Health and Safety Code Sections 7050.5, 7051, and 7052
- California Penal Code, Title 14, Section 622.5
- California Public Resources Code Sections 5024, 5024.5, 5097.5, 5097.9, and 622.5

Regional Prehistory and History

This section provides a brief overview of the current understanding of human occupation of the California coast and estuaries like Tijuana Estuary from at least 10,000 years ago to the more recent history of the 20th century. The Kumeyaay, the original native inhabitants of what is now called San Diego County, have roots that extend thousands of years in this area, as well as in northern Baja California.

Several cultural chronologies have been developed to address the variability in archaeological assemblages over this broad time frame; some are based on geologic time, most are based on temporal trends in archaeological assemblages, and others are interpretive reconstructions. Generalized terms used to describe chronological trends in assemblage composition include Paleoindian (11,500–8,500 years before present [B.P.]), Archaic (8,000–1,500 B.P.), Late Prehistoric (AD 500–1769 or 1,500–252 B.P.), and Ethnohistoric (post-AD 1769) (CSP 2021).

The Paleoindian period in San Diego County is considered to date to the terminal Pleistocene and the early Holocene, from approximately 11,500 B.P. to 8500 B.P. (Moratto 1984; Warren *et al.* 1993). The range of possible economic adaptations during the Paleoindian period to the paleoenvironment in San Diego County are poorly understood at present, but it is typically assumed that these groups followed lifeways similar to other Paleoindian groups in North America (Garcia-Herbst and Ghabhláin 2008).

During the Early Archaic period (sites dated between approximately 8000 and 1500 B.P.), represents a shift from the earlier Paleoindian period to a more generalized economy and increased focus on use of grinding and seed processing technology (Tierra Environmental Services 2008). Increased use of groundstone artifacts, atlatl dart points, and a mixed core-based tool assemblage

identifies a range of adaptations to a more diversified set of plant and animal resources (Tierra Environmental Services 2008).

Around 8,000 years ago, it appears that the rise in sea level began to slow, allowing the formation of productive bay, lagoon, and estuary habitats at many locations along the San Diego County coastline (Carbone 1991; Masters and Gallegos 1997), including at what is known today as Tijuana Estuary. These habitats seem to have supported a substantial coastal population during the early Archaic. Data suggests that some of the southern California coastal lagoons were closed to tidal circulation between about 3,500 and 1,000 years ago (Masters and Gallegos 1997; Byrd *et al.* 2004; York *et al.* 2001) and may have resulted in a population movement inland and southward in response to siltation and declining productivity of coastal lagoons in the northern portion of the county.

The period following the Early Archaic period is commonly referred to as the Late Prehistoric (AD 500–AD 1769) (Rogers 1945; Wallace 1955; Warren *et al.* 2004). However, several other subdivisions continue to be used to describe various shifts in assemblage composition, including the addition of ceramics and cremation practices. In northern San Diego County, the post-AD 1450 period is called the San Luis Rey Complex (True 1966), while the same period in southern San Diego County is called the Cuyamaca Complex and is thought to extend from AD 500 until Ethnohistoric times (Meighan 1959). Rogers (1929) also subdivided the last 1,000 years into the Yuman II and III cultures, based on the distribution of ceramics. Despite these regional complexes, each is defined by the addition of arrow points and ceramics and the widespread use of bedrock mortars. Vagaries in the appearance of the bow and arrow and ceramics make the temporal resolution of the San Luis Rey and Cuyamaca Complexes difficult. For this reason, the term Late Prehistoric is well suited to describe the last 1,500 years of prehistory in the San Diego region (CSP 2021).

European activity in the region began as early as AD 1542, when Juan Rodríguez Cabrillo landed in San Diego Bay. Sebastián Vizcaíno returned in 1602, and it is possible that there were subsequent contacts that went unrecorded. These brief encounters made the local native people aware of the existence of other cultures. Epidemic diseases may also have been introduced into the region at an early date, by direct contacts with the infrequent European visitors or through waves of diffusion emanating from native peoples farther to the east or south (Preston 2002).

The Ethnohistoric period is described as post-AD 1769. The history of the Native American communities prior to the mid-1700s has largely been reconstructed through later mission-period and early ethnographic accounts. The first records of the Native American inhabitants of the San Diego region come predominantly from European merchants, missionaries, military personnel, and explorers. These brief, and generally peripheral, accounts were prepared with the intent of furthering respective colonial and economic aims and were combined with observations of the

landscape. They were not intended to be unbiased accounts regarding the cultural structures and community practices of the newly encountered cultural groups (CSP 2021). In 1769, the Kumeyaay national territory started at the coast about 100 miles south of the Mexican border (below Santo Tomas) and stretched north to the coast at the drainage divide south of the San Luis Rey River, including its tributaries (CSP 2021).

The Kumeyaay generally lived in smaller family subgroups that would inhabit two or more locations over the course of the year. While less common, there is sufficient evidence that there were also permanently occupied villages, and that some members may have remained at these locations throughout the year (Owen 1965; Shipek 1982, 1985; Spier 1923). Each autonomous tribelet was internally socially stratified, commonly including higher status individuals such as a Tribal head (Kwaay Pay), a shaman (Kuseyaay), and general members with various responsibilities and skills (Shipek 1982).

San Diego history from the beginning of the ethnohistoric period to present can be divided into the Spanish Period (1769–1821), Mexican Period (1821–1846), and American Period (1846–Present) (CSP 2021). When the Spanish arrived in California in 1769, the proposed restoration site was within the territory of the Kumeyaay. It is estimated that between 16,000 to 20,000 Kumeyaay people lived in the area from San Dieguito River to Ensenada by the 1770s. Ethnohistoric villages documented by a Spanish land expedition in San Diego included a village at the mouth of Goat Canyon (*Millejo*) and at the base of the San Diego Harbor (*Las Chollas*) (Tierra Environmental Services 2008).

The Spanish colonization of Alta California began in 1769 with the founding of Mission San Diego de Alcalá by Father Junípero Serra. The initial Spanish occupation and mission system brought about profound changes in the lives of the Kumeyaay people. Substantial numbers of the coastal Kumeyaay were forcibly brought into the mission or died from introduced diseases (CSP 2021). Throughout the Spanish period, the valleys and mesas of the Tijuana River Valley were relatively undisturbed.

The period between 1821 and 1846 is referred to as the Mexican Period. It was during the Mexican period, and due to the Mexican land grant system, that the first substantial developments occurred within the areas in and around San Ysidro.

In 1822, the political situation changed as Mexico won its independence from Spain and San Diego became part of the Mexican Republic. The Mexican Government opened California to foreign trade; began issuing private land grants in the early 1820s, creating the rancho system of large agricultural estates; secularized the Spanish missions in 1833; and oversaw the rise of the civilian pueblo (CSP 2021).

The secularization in San Diego County triggered increased Native American hostilities against the Californios during the late 1830s. The attacks on outlying ranchos, along with unstable political and economic factors, contributed to San Diego's population decline that by 1840 consisted of only 150 permanent residents. When the Americans took over after 1846, the situation had stabilized somewhat, and the population had increased to roughly 350 non-Native American residents. The Native American population continued to decline, as Mexican occupation brought about continued displacement and acculturation of Native American populations (CSP 2021).

In November 1845, U.S. President James K. Polk's emissary to Mexico failed to secure boundary adjustments and the United States declared war on Mexico. After Americans took Mexico City, Mexico ceded roughly half its territories, including Alta California, San Diego, and Tijuana Estuary, to the United States. Most of the Tijuana River watershed upstream, however, remained in Mexican hands, a decision that continues to affect the estuary today. In the aftermath of war, Mexico and the United States on February 2, 1848, signed the Treaty of Guadalupe Hidalgo, which resulted in a new 2,000-mile border between the two countries. The surveying would be a 6-year process, complicated by poor equipment, underfunding, and political infighting. However, the border's westernmost position was clear. In 1851, the schooner Annette delivered a permanent boundary marker, made of Italian marble in New York. U.S. Army soldiers from New Town (today's downtown San Diego) escorted the three-piece obelisk to the border by gun carriages and ceremoniously erected the 15-foot-high obelisk onto a 4-foot-thick, mortared brick base. The site officially became known as "Monument Mesa" (CSP 2021).

The American Period began in 1846 when U.S. military forces occupied San Diego. This period continues today. On January 4, 1850, a committee of California's first constitutional convention recommended the creation of 18 counties, including San Diego County. The County, which at that time included areas now part of Imperial and San Bernardino Counties, grew slowly for the next decade. Not until land speculator and developer Alonzo Horton arrived in 1867 did San Diego begin to develop fully into an active American town (CSP 2021).

Development in San Ysidro began around the turn of the 20th century. In 1909, Little Landers Corporation established a pattern of development designed to accommodate small plots of land for each homeowner to farm as part of a farming-residential cooperative community. This experimental agricultural colony, located east of present-day Border Field State Park, functioned until the homes were destroyed by the flood of 1916 (Tierra Environmental Services 2008).

The initial development of Imperial Beach began around 1909, providing a summer retreat for residents of the Imperial Valley. In 1910, as a result of the Mexican Revolution, U.S. troops were stationed at camps near Monument Mesa. To help patrol the U.S. boundary, the army established Camp Hearn at Imperial Beach to the north of the estuary. In 1929, the Department of the Navy began acquiring acreage just north of the border, calling it "Border Field." It was used as a

machine-gun range and airborne gunnery range. In 1941, the Navy leased 245 acres along the border and, by 1944, had established Border Field Auxiliary Landing Field, an operation that included approximately 30 buildings and structures, including barracks, a galley, and a machine-gun range. Most of these facilities were temporary and used for offices, quarters, shops, and ammunition storage. Substantial improvements to the site included the bombing target and the range complex. The range complex consisted of five or six jeep-type moving targets in the dune area for ground gunnery training; a mobile firing line in the center of the site; and air-to-ground gunnery ranges that contained rails, known as "Rabbit Tracks," that would guide steam-driven targets for aerial gunnery (strafing) training. Individual sites have been primarily eroded by wind, weather, and seasonal flooding, but historic foundations associated with the U.S. Navy housing have been identified within TRNERR.

In the 1950s, the site was used on weekends by the California National Guard as a launching area for pilotless target drones. In 1955, the area just north of the estuary began operating as a helicopter landing field, and the home base for helicopter squadrons of the Pacific Fleet. The gunnery training activities at Border Field were discontinued in 1961. In 1971, the property was transferred to the State of California and became Border Field State Park.

Cultural Records Search and Investigations

Applicable cultural resources research in the project area was conducted for the Model Marsh project and the overall TETRP program as described in the Feasibility Study, including a data recovery program and fieldwork. A records and literature search was conducted at the South Coast Information Center (SCIC) at San Diego State University and the San Diego Museum of Man to provide information on previous cultural resources surveys and previously recorded cultural resource sites within the entire Tijuana Estuary region north of the international border. The cultural study area extends over 5 miles east of the proposed project, and about 2.5 miles north of the international border to Imperial Beach. While 49 archaeological investigations have taken place within Tijuana Estuary region, the SCIC records search conducted for the Model Marsh project identified 15 recorded archaeological resources within or directly adjacent to the TETRP II Phase I APE. An archaeological survey was completed in 2003 in the overall TETRP footprint, and a trenching program was conducted in 2006 to inform the Feasibility Study. Areas were mechanically excavated to depths of approximately 1.1 to 4.5 meters (m) during this effort, and 51 trenches were excavated. More recently, an archaeological testing program was conducted in 2019 by ASM to determine presence or absence of archaeological resources within the TETRP II Phase I APE. Backhoe excavation of 23 trenches (approximately 15–20 feet long with a goal depth of 4 m) were implemented, including a survey of a 30-m buffer surrounding each proposed trench. The trenches were placed within and near previously recorded archaeological sites as well as areas outside of known sites where deeper excavation is planned. ASM also conducted a sediment core analysis to observe whether previously unknown archaeological deposits were detectable in

extracted sediment cores, although cultural deposits were not identified during archaeological monitoring of the sediment collection (ASM 2021b).

Additional pertinent cultural resources data was obtained from construction monitoring documents of the Model Marsh project in 2000, road repairs of Monument Road (e.g., Beach Trail) in 2009, and surveys conducted within the entirety of Border Field State Park in 2016 and 2017 by volunteers affiliated with the San Diego County Archaeological Society (SDCAS) and the Society for California Archaeology (SCA). SDCAS and SCA surveys are referred to as the Coastal Climate Change Survey as they were completed as part of a larger program to inventory cultural resources along the coast of San Diego County in response to sea level rise (Pentney *et al.* in progress).

The SCIC records search indicates that no potentially eligible built environment historic properties or historical resources for the purposes of NEPA and CEQA have been identified within the APE.

Recorded Sites within the APE

Previous investigations have recorded 14 archaeological sites within the APE. Of these 14 archaeological sites, three (CA-SDI-12456, CA-SDI-14831, and CA-SDI-22591) do not appear to qualify as a historical resource or unique archaeological resource under CEQA or as a historic property under Section 106 of the National Historic Preservation Act (Section 106). Further, five other sites are no longer present; four that were originally recorded out of context within the roadbed were not relocated during a 2016 archaeological survey (P-37-31730, P-37-31731, P-37-31733, and P-37-31734), and the associated artifacts of the fifth were collected in a previous study (CA-SDI-20156). These eight archaeological sites do not qualify under CEQA or Section 106; therefore, no further consideration is necessary. The remaining six archaeological sites identified in the APE have data potential and are described below. One of these six sites, CA-SDI-13718/CA-SDI-13718H, was recorded separately; however, they are the same site. These six archaeological sites within the APE are considered eligible for listing in the National Register of Historic Places (NRHP) under Criterion D and the California Register of Historical Resources (CRHR) under Criterion 4 due to the potential that these properties may yield information important in prehistory or history (Table 4.8-1).

Table 4.8-1
Eligible/Assumed Eligible Archaeological Resources within the APE

Resource Number	Period	NRHP/CRHR Eligibility
CA-SDI-13718; CA-SDI-13718H	Historic	Recommended not eligible for NRHP in 1994; however, additional evaluation work is recommended to determine eligibility
CA-SDI-15598	Prehistoric	Potentially eligible
CA-SDI-17664	Possible Prehistoric	Additional evaluation work recommended to determine eligibility
N/A; Bullet Dump	Historic-era Isolated Feature	Not evaluated
N/A; GN2/Model Boat Dump	Historic	Not evaluated
N/A; Shells and Bottles Site/Shell Scatter Site	Historic	Not evaluated

APE = area of potential effects; CRHR = California Register of Historical Resources; NRHP = National Register of Historic Places; N/A = not applicable
Source: ASM 2021a

Native American Tribal Government Consultation

Consultation under Federal Requirements.
The process for initiating consultation between the USFWS and affected Tribal Governments for the TETPR II Phase I project began in 2017 with a request to the Native American Heritage Commission (NAHC) for a scared lands search of the project site, as well as a Native American contact list for Tribes with an interest in projects occurring within and surrounding the project site. The NAHC response identified 13 Tribes with a potential interest in the project and a search of the Sacred Lands File identified sites that could be impacted by the project.

In coordination with the USFWS Regional Cultural Resources Team, letters requesting initiation of consultation were prepared in September 2017 and signed jointly by the San Diego National Wildlife Refuge Complex and CSP. In total, 13 Tribes, as identified by the NAHC, were sent letters for the purpose of initiating consultation. One response was received in October 2017, from the Viejas Tribal Government with a request that a Kumeyaay Cultural Monitor be on-site for all ground-disturbing activities and that information be provided if any inadvertent discoveries were made of cultural artifacts, cremation sites, or human remains. In accordance with this request, a Kumeyaay Cultural Monitor, as well as a qualified archaeologist, were retained to oversee activities on the site related to sediment testing and analysis. The requirement for a Kumeyaay Cultural Monitor is also included as a mitigation measure for any other ground-disturbing activities associated with the project or project implementation.

In May 2021, the NAHC provided updated Tribal contact information in response to a request sent in April 2021. With this updated contact information, on May 27, 2021, the Tribes were provided with the Notice of Preparation/Notice of Intent to prepare a DEIR/EIS for the subject project, and an outreach letter was sent to each of the 13 Tribes identified by the NAHC. CSP and the USFWS then participated in two requested consultations, involving the Jamul Indian Village and the San Pasqual Band of Diegueño Mission Indians. Coordination with the Tribes has and will continue throughout the preparation and implementation of the Monitoring and Discovery Plan, as described in Section 4.8.4.

Consultation under California Requirements.
Refer to Section 4.9 for information on Tribal Cultural Resources pursuant to California AB 52.

4.8.2 CEQA Thresholds of Significance

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5;

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5; or

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

CEQA requires the lead agency to determine whether the proposed project could have a significant impact on historical resources and equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment (Section 21084.1). CEQA Guidelines Section 15064.5 outlines the process for determining the significance of impacts to archaeological and historical resources. CEQA Guidelines Section 15064.5(a) defines "historical resources." Generally, a resource shall be considered historically significant if the resource meets the criteria for listing in the CRHR:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; or
2. Is associated with the lives of persons important in our past; or
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possess high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

NEPA Impact Analysis

Under NEPA, the assessment of potential adverse impacts to cultural resources is considered with respect to potential adverse effects on historic properties that are listed in or eligible for the NRHP, pursuant to 36 CFR § 800.5. The NRHP criteria are presented in 36 CFR § 60.4 as follows:

> The quality of significance in American history, architecture, archeology, and culture is present in districts, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
> B. That are associated with the lives of persons significant in our past; or
> C. That 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. That have yielded, or may be likely to yield, information important in prehistory or history.

Unevaluated resources are considered potentially eligible for listing in the NRHP and the CRHR and are treated as eligible for the purposes of impact analysis.

4.8.3 Environmental Evaluation

The 1991 TETRP EIR/EIS found that implementation of Model Marsh, including the Oneonta Slough Widening, and the overall restoration project would result in potentially significant impacts to cultural resources due to the potential to encounter recorded and unknown archaeological sites. Mitigation for these impacts specified a halt of construction activities until the sites could be assessed, and for development of specific mitigation measures once the full extent and significance of the site could be determined and the assessment was complete.

TETRP II Phase I currently under evaluation in this tiered document overlaps with some of the areas evaluated within the 1991 TETRP EIR/EIS. Additionally, since the certification of the previous EIR/EIS, more recent studies have been conducted within the APE as described above. Thus, potential archaeological resources impacts identified in the 1991 TETRP EIR/EIS have been updated within the analysis discussion below to reflect more recent project site information within the current APE.

4.8.3.1 Restoration/Enhancement

Alternative 1

As discussed in Section 4.8.1, six archaeological resources that are assumed eligible and treated as historical resources for the purposes of this impact analysis are recorded within the APE. These sites mostly consist of historic refuse scatter, munitions and trash scatter, and midden deposits. Since the majority of the project site is covered in recent sediment deposits, buried stable surfaces below may also contain as yet unknown historical or archaeological resources. While it is anticipated that the majority of materials removed from the estuary during implementation of Alternative 1 would be relatively recent alluvial deposits, grading and ground-disturbing activities may have the potential to encounter historical and/or archaeological resources in these stable sediments. Implementation of Alternative 1 (i.e., excavation, ground-disturbing activities) may result in substantial adverse changes to historical and archaeological resources, including physical destruction such that their significance would be materially impaired, and they would no longer yield valuable information. **Physical impact to, or destruction of, historical or archaeological resources resulting from implementation of Alternative 1 would be considered a significant impact under CEQA (CEQA Criteria A and B) or NEPA.**

No previously recorded cultural resources have been identified within the mouth of the estuary. Through previous Section 106 consultation conducted for similar river mouth excavation efforts, it was determined that given the undertaking activities (i.e., excavation, ground-disturbing activities), location, and littoral/fluvial history, the periodic removal of materials from the river mouth had no potential to cause effect on historic properties (USFWS 2017). Due to this finding and the fact that the river mouth contains mostly recently deposited material, potential impacts to historical or archaeological resources are not anticipated. **Thus, no impacts resulting from periodic removal of material from the river mouth are anticipated under CEQA (CEQA Criteria A and B) or NEPA.**

There is no evidence indicating the possible presence of human remains within the project site**.** However, it is possible that undiscovered buried human remains may exist on stable sediments in the APE that would be exposed during excavation or ground-disturbing activities. **Thus, Alternative 1 could result in a significant impact to human remains under CEQA (CEQA Criteria A and B) and NEPA.**

Proposed Project

The proposed project is similar to Alternative 1, and restoration and other enhancement efforts that would occur under the proposed project would not change or alter cultural resources impacts as analyzed for Alternative 1 above; thus, discussions and conclusions identified under Alternative 1

are also applicable to the proposed project. **Therefore, the proposed project would result in significant impacts to historical and archaeological resources pursuant to CEQA (CEQA Criteria A and B) and NEPA, as well as a significant impact to human remains under both CEQA and NEPA.**

No Project/No Action Alternative

If the No Project/No Action Alternative is implemented, no project-related ground-disturbing activities would occur. **As a result, no significant impacts to historical or archaeological resources or human remains are anticipated in accordance with CEQA (CEQA Criteria A through C) or NEPA.**

4.8.3.2 Soil Management

No previously recorded cultural resources are located within the beach and swash zone placement areas. No evidence indicates the possible presence of human remains within the nourishment areas along the beach. Beach nourishment would place sand on the existing surface and would not involve excavation. In addition, sand deposits are dynamic, and material is constantly moving onshore and offshore, decreasing the likelihood that undiscovered human remains would be present in this area. Therefore, the placement of material as beach nourishment or project-related fill would have no substantial adverse change in the significance of a historical or archaeological resource and would not disturb human remains. **No significant impacts to eligible historical or archaeological resources or human remains are anticipated under CEQA (CEQA Criteria A through C) or NEPA.**

4.8.4 Avoidance, Minimization, and Mitigation Measures

Archaeological resources or human remains could be substantially damaged or destroyed during excavation of underlying stable sediments within the project site resulting from restoration and enhancement activities. Damage or destruction of historical or archaeological resources would be considered a significant impact under CEQA and NEPA.

Mitigation measures Cultural-1 through Cultural-5 would be required under CEQA for implementation of the proposed project and would reduce impacts to less than significant under CEQA. Adverse effects under Section 106 would be resolved through separate consultation with the SHPO/THPO and consulting parties, as applicable. These mitigation measures along with requirements identified in the Monitoring and Discovery Plan, and applicable stipulations set forth in future Section 106 consultation will resolve adverse effects on historic properties, resulting in no significant impacts under NEPA.

Cultural-1: Implementation of Alternative 1 and the proposed project requires that a Monitoring and Discovery Plan be prepared and approved by CSP and the USFWS's Regional Historic Preservation Officer prior to the issuance of the required project regulatory permits. The Monitoring and Discovery Plan shall also provide protocols in the event archaeological material is encountered during construction of the project. If resources are identified during construction, the procedures outlined in the Monitoring and Discovery Plan would be followed, including applicable late discovery protocols per Section 106 of the National Historic Preservation Act. These procedures would include:

- Ground-disturbing activity would be temporarily halted by the project archaeologist and/or the Kumeyaay cultural monitor at the location of the find, and ground-disturbing work would be redirected elsewhere until the find is assessed by a qualified archaeologist, in consultation with CSP and the USFWS's Regional Historic Preservation Officer, to determine if the discovery constitutes a potential intact resource. If potential intact resources are discovered, then the notification and treatment methods outlined in the Monitoring and Discovery Plan would be implemented.
- If the find is determined to be potentially eligible for the NRHP or CRHR:
  - on stable surfaces, an exclusionary zone would be set up around the find and marked (e.g., lath and flagging or silt fencing);
  - a plan would be formulated for evaluation or avoidance through redesign, and;
  - dredging or other ground-disturbing activities would not resume in that location until approved by the USFWS and CSP.

Evaluation procedures would include:

- subsurface excavation (in stable sediments), if necessary,
- cataloging and laboratory analysis of recovered cultural materials,
- curation of the artifact collection at an approved regional facility, and
- preparation of a draft and final technical report pursuant to CEQA and NEPA documenting the discovery and addressing regional research issues, and
- consultation with local Native Americans in accordance with Section 106 regarding the significance and treatment of cultural resources encountered.

Cultural-2: Implementation of Alternative 1 and the proposed project requires that a qualified archaeological monitor and a Kumeyaay cultural monitor shall be present during any project-related ground-disturbing activity.

Cultural-3: Implementation of Alternative 1 and the proposed project requires that a training session for project construction personnel shall be conducted by a qualified archaeologist and Kumeyaay cultural monitor prior to the start of ground-disturbing activities. Training in the appropriate work practices will occur to effectively identify and implement treatment of cultural resources and to comply with the applicable environmental laws and regulations, including those

related to recognizing possible buried resources and maintaining the confidentiality of resources at in-situ locations. The training session shall include a review of required monitoring locations and communication protocols, types of cultural resources that might be encountered, cultural resources responsibilities, protection procedures, and avoidance measures.

Cultural-4: If human remains are encountered during implementation of the project:

- On-site monitors shall be informed immediately, and work at that location shall be suspended and redirected elsewhere.
- USFWS and CSP will be immediately notified of the discovery.
- Remains will be left in place and exclusionary fencing will be placed in a 50-foot radius around the discovery.
- Under the provisions of California PRC Section 7050.5, the County Coroner will be notified in the event of discovery of human remains.
- If the remains are either determined to be or there is reason to believe they are Native American, the coroner will notify the Native American Heritage Commission (NAHC) within 24 hours.
- Disposition of Native American human remains on non-federal lands is within the jurisdiction of the NAHC. The USFWS and CSP, as lead agencies for the project, will initiate consultation with the NAHC. As part of the consultation process, the NAHC will notify persons most likely to be descended (MLD) from the remains. No ground-disturbing work will occur in the location of the remains until consultation between the NAHC, MLD, USFWS, and CSP has been completed, and notification by the USFWS and CSP that construction activities may resume.
- If remains are on federal land and discovered in situ, they will be left in place and covered with weather-proof materials such as a tarp or plywood. If the remains are on federal land and discovered in spoils, the remains will be protected as above. In either case, the USFWS and pertinent Tribes will convene to discuss handling. An osteologist or a forensic anthropologist will, in consultation with the MLD, inspect fragmentary bones that are suspected to be human but cannot be identified as such in the field.
- Coordination with the Kumeyaay Cultural Repatriation Committee is required for inadvertent discoveries on the project site.

Cultural-5: Exclusionary fencing shall be used to avoid inadvertent disturbance of cultural resources within or in proximity to the APE, staging areas, and access roads. The temporary exclusionary fencing shall be placed parallel to staging areas or the access road's existing limits of disturbance in locations where they are within 15 feet of the site.

4.9 TRIBAL CULTURAL RESOURCES

California AB 52 (Chapter 532, Statutes 2014) established the new category of resources in CEQA to consider Tribal cultural values in addition to scientific and archaeological values when determining impacts and mitigation. A Tribal cultural resource is identified as a site, feature, place, cultural landscape, sacred place or object that is of cultural value to a Tribe. The Tribal cultural study area refers to the entire boundary of TRNERR while the APE is the extent of physical disturbance for TETRP II Phase I as shown in Figures 3-2 and 3-4. This section is based on information from the Tribal cultural resources consultation as conducted by CSP and participating Tribes.

4.9.1 Affected Environment

AB 52 requires a CEQA lead agency to provide formal notification to designated contact or Tribal representatives of affiliated California Native American Tribes of proposed projects in the geographic area with which the Tribe is traditionally and culturally affiliated. California Native American Tribes are those included "on the contact list maintained by the Native American Heritage Commission (NAHC) for the purposes of Chapter 905 of the Statutes of 2004a" (PRC Section 21073). Under AB 52, a Tribal cultural resource is identified as a site, feature, place, cultural landscape, sacred place or object, which is of cultural value to a Tribe; and is either on or eligible for the California Register of Historic Resources or a local historic register; or the lead agency, at its discretion chooses to treat the resource as a Tribal cultural resource (PRC Section 21074).

CSP, the CEQA Lead Agency, jointly with the USFWS, the NEPA Lead Agency, contacted the NAHC to identify representatives from appropriate Native American Tribes and their associated bands. An updated Sacred Lands File Search was requested from the NAHC on April 26, 2021. A formal response from the NAHC was provided on May 10, 2021, that indicated a positive finding with regard to the presence of sacred sites within the APE. On May 27, 2021, Native American representatives were contacted regarding the release of the NOP. On September 7, 2021, CSP sent an outreach letter to the list of 20 Native American Tribal representatives identified by the NAHC (comprising 13 Tribes) and followed up with both emails and phone calls. Of the 13 Tribes on the consultation list, CSP and the USFWS received five responses and of these, two Tribes (i.e., the Jamul Indian Village [Jamul] and the San Pasqual Band of Diegueño Mission Indians [San Pasqual]) requested formal consultation with CSP and the USFWS during the preparation of the DEIR/EIS. In addition, the Viejas Band of Kumeyaay Indians (Viejas) also requested to be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains.

The NAHC sacred lands file search was positive; however, the group identified by the NAHC as being associated with the sacred lands file did not indicate that sacred sites are located within the APE. During consultation, the project site was not identified as the location of religious or sacred use. However, responses from the consulting Tribes stated that the TETRP II Phase I footprint was within Tribal ancestral territory and requested that Kumeyaay Native American monitors be present during ground-disturbing activities.

A formal consultation meeting was held on September 29, 2021, and a representative from Jamul, SWIA, the USFWS, and representatives from CSP were present. A summary of TETRP II Phase I and the environmental setting was summarized and discussed. Both natural and cultural concerns were discussed and noted. It was reiterated that a Kumeyaay Native American monitor be present during ground-disturbing activities, and that avoidance is the preferred treatment measure if Tribal cultural resources are found during the project.

Continued communication with Tribes will be ongoing, as requested by the three Tribes mentioned above. Non-confidential information concerning traditional cultural properties and resources obtained through continued consultation are included in this FEIR/EIS.

4.9.2 CEQA Thresholds of Significance

Would the project:

a) Cause a substantial adverse change in the significance of a Tribal cultural resource, defined in PRC § 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 CRHR, or in a local register of historical resources as defined in PRC 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 PRC § 5024.1. In applying the criteria set forth in subdivision (c) of PRC § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

4.9.3 Environmental Evaluation

The 1991 TETRP EIR/EIS did not evaluate Tribal cultural resources; therefore, the following analysis is independent of the previous environmental document.

4.9.3.1 Restoration/Enhancement

Alternative 1

While the NAHC sacred lands file search was positive, through the consultation process it has been confirmed with the consulting Tribes that no sacred sites are located within the APE and the project site is not identified as the location of religious or sacred use. However, ground-disturbing activities into stable sediments in the APE could expose unknown Tribal cultural resources. **Therefore, Alternative 1 would result in substantial adverse effects to Tribal cultural resources and would be considered potentially significant under CEQA (CEQA Criterion A).**

Proposed Project

The proposed project is similar to Alternative 1, and restoration and enhancement efforts that would occur under the proposed project would not change or alter Tribal cultural resources impacts as analyzed for Alternative 1 above; thus, discussions and conclusions identified under Alternative 1 are also applicable to the proposed project. **Therefore, the proposed project would potentially result in a significant impact to Tribal cultural resources with substantial adverse effects identified under CEQA (CEQA Criterion A).**

No Project/No Action Alternative

If the No Project/No Action Alternative is implemented, no project-related ground-disturbing activities would occur. **As a result, no significant impacts to Tribal cultural resources are anticipated (CEQA Criterion A).**

4.9.3.2 Soil Management

As stated above, no Tribal cultural resources have been identified within the APE. Since soil management would not involve excavation into subsurface materials, Tribal cultural resources are not anticipated to be encountered during soil management. **Therefore, a substantial adverse change in the significance of a Tribal cultural resource would not occur and a less than significant impact would result under CEQA (CEQA Criterion A).**

4.9.4 <u>Avoidance, Minimization, and Mitigation Measures</u>

Tribal cultural resources could be substantially damaged or destroyed during excavation of underlying stable sediments within the APE resulting from restoration and enhancement efforts. Damage or destruction of these resources would be considered a significant impact under CEQA.

Mitigation measures Cultural-2 through Cultural-5 would be required under CEQA for implementation of TETRP II Phase I.

Implementation of mitigation measures Cultural-2 through Cultural-5 would reduce project impacts to Tribal cultural resources to less than significant under CEQA.

4.10 PALEONTOLOGICAL RESOURCES

Paleontological resources include fossilized remains or traces of prehistoric plants or animals, with the exception of human remains, as well as the deposits associated with those remains. These resources can include bones and teeth as well as materials such as shells and wood. Paleontological resources are located in the geologic deposits in which they were originally buried and can often provide a valuable record of historical environmental conditions, depending on the age and the characteristic of the formation. Paleontological resources represent limited, nonrenewable, and sensitive scientific and educational resources.

Several studies have been completed to characterize geologic formations in the region, as well as their potential for containing paleontological resources. The following analysis is based on the baseline conditions established in Kennedy and Tan's report (1977) on the geology of southwest San Diego County prepared for the California Geological Survey (formerly the California Division of Mines and Geology) and *Paleontological Resources, County of San Diego, California* (Deméré and Walsh 2003).

4.10.1 Affected Environment

Due to the relationship between fossils and geologic formations in which they can occur, the geology of an area provides a reasonable basis for predicting the potential presence of paleontological resources. The project site is considered Holocene age alluvium which consists of alluvium (Qal) and slopewash (Qsw) (Kennedy and Tan 1977). In addition to these sediments, quaternary beach and bar deposits (Qb) (i.e., unconsolidated sand and silt) make up the fronting beach near the river mouth and easternmost portion of the estuary. Alluvium material is characterized as poorly consolidated stream deposits of silt, sand, and cobble-sized particles derived from nearby bedrock sources. Slopewash is mainly from nearby sources of soil and decomposed bedrock which ultimately is deposited along the flanks of lower valley slopes.

Generalized potential sensitivity for different geologic deposits within San Diego County are provided in *Paleontological Resources, County of San Diego, California* (Deméré and Walsh 2003). The proposed project is located within the Coastal Plain region of the Peninsular Ranges Province. The Coastal Plain region is underlain by a "layer cake" sequence of marine and nonmarine sedimentary rock units that record portions of the last 140 million years of earth history. Over this period of time, the relationship of land and sea has fluctuated drastically such that there are ancient marine rocks preserved up to elevations of around 900 feet above sea level and ancient river deposits as high as 1,200 feet. Faulting related to the local La Nación and Rose Canyon fault zones has broken up this sedimentary sequence into a number of distinct fault blocks in the southwestern part of San Diego County, while in the northern area the effects of faulting are not as great and the rock units are relatively undeformed.

Table 4.10-1 describes the characteristics of the Holocene-era alluvium within the project site and associated paleontological sensitivity rating. Within the estuary, there is a low potential for alluvium to yield paleontological resources. However, mammoth teeth and limb bones have been found in floodplain deposits of the Tijuana River Valley which suggests, despite a low sensitivity rating for paleontological resources, findings can occur.

Table 4.10-1
Geologic Formation Characteristics and Paleontological Resource Sensitivity within the Project Site

Formation	Characteristics	Sensitivity
Later Quaternary Alluvium	Fossils are generally unknown from the later Quaternary alluvial deposits in the Coastal Plain Region. There are three notable exceptions. Teeth and limb bones of a mammoth were found in floodplain deposits of the Tijuana River Valley, a single mammoth tusk was found in alluvial deposits in the southwestern portion of El Cajon Valley, and a mammoth femur was recovered from alluvial deposits in the Santa Margarita River channel at the south end of the Camp Pendleton Marine Corps Base.	Low

Source: Deméré and Walsh 2003

4.10.2 CEQA Thresholds of Significance

Would the project:

a) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

4.10.3 Environmental Evaluation

The 1991 TETRP EIR/EIS did not evaluate potential impacts to paleontological resources; therefore, the proposed project currently under evaluation in this tiered document cannot rely on previous analysis, significance conclusions, or mitigation measures.

As previously described, there is a direct relationship between fossils and the geologic formations in which they are contained. As such, with information specific to the geology of a particular area and the corresponding paleontological resource potential, it is possible to reasonably assess whether fossils may or may not be found during excavation in the underlying geologic materials or formations. However, because paleontological resources are typically irregularly dispersed throughout a geologic formation, both vertically and horizontally, it is not possible to predict the specific location of fossils within a particular formation.

Direct impacts to a paleontological resource could result from ground-disturbing activities (e.g., grading, excavation, trenching, boring, tunneling) that disrupt subsurface geologic

formations. Indirect impacts to paleontological resources are not specifically caused by development of a project but may be a reasonably foreseeable result of project implementation. For example, increased erosion during or after completion of a project or the unauthorized tampering or removal of a fossil or paleontological resource from a project site could result in the destruction or loss of surface fossils. Activities that place material on top of existing surface areas, such as building up dikes or placement of material to level a surface, do not typically have the potential to adversely impact subsurface resources.

4.10.3.1 Restoration/Enhancement

Alternative 1

Project-related ground disturbance under Alternative 1 would occur during excavation and dredging activities that would be limited to portions of the estuary and beach that are generally underlain by alluvial and beach deposits, respectively. Under Alternative 1, dredging and excavation would occur to a maximum depth of approximately +2.0 feet NAVD. At this depth, it is not anticipated that materials beyond alluvial deposits would be reached. Periodic excavation of material from the river mouth would occur but would be restricted to the beach deposits and to settled materials within the river mouth, rather than underlying materials. As shown in Table 4.10-1, Quaternary alluvial sediments are assigned a low paleontological resource sensitivity because of their young age. While resources have been found within the area, given the low sensitivity of alluvium, it is anticipated that potential unearthing of resources would be relatively low. As such, it is not anticipated that paleontological resources would be encountered during excavation or dredging activities under the Alternative 1.

Additionally, Alternative 1 would not create opportunities for tampering or removal of paleontological resources. **Thus, excavation and dredging associated with Alternative 1 would not destroy paleontological resources, either directly or indirectly, and impacts would be less than significant under CEQA (CEQA Criterion A), and no significant effects would occur pursuant to NEPA.**

Proposed Project

Similar to Alternative 1, ground-disturbing activities under the proposed project would occur during excavation and dredging activities that would be limited to portions of the estuary that are underlain by alluvial and beach deposits. These deposits have relatively low sensitivity and a low potential for including paleontological resources. Dredging and excavation would occur at a depth similar to Alternative 1; therefore, it is assumed that during construction activities, paleontological resources would not be encountered. Project implementation would not increase opportunities for tampering or removal of paleontological resources. **Therefore, the proposed project would not**

destroy paleontological resources, either directly or indirectly, and impacts would be less than significant under CEQA (CEQA Criterion A), and no significant effects would occur pursuant to NEPA.

No Project/No Action Alternative

Excavation or dredging within undisturbed, interior areas in the estuary or beach would not occur under the No Project/No Action Alternative. **Therefore, the No Project/No Action Alternative would not result in direct or indirect impacts to paleontological resources and no impact would occur pursuant to CEQA (CEQA Criterion A) or NEPA.**

4.10.3.2 Soil Management

No excavation is proposed as part of the soil management component of the proposed project. Beach nourishment would not require disturbance of underlying formations, and the beach is a generally dynamic environment where it is unlikely to encounter undiscovered paleontological resources. Additionally, actions that place material on top of existing surface areas, such as placement of material to level a surface, do not have the potential to adversely impact subsurface resources. **Thus, soil management would not have the potential to directly or indirectly disturb or destroy paleontological resources and impacts would be less than significant under CEQA (CEQA Criterion A) and no significant effects would occur pursuant to NEPA.**

4.10.4 Avoidance, Minimization, and Mitigation Measures

Impacts to paleontological resources from implementation of Alternative 1 and the proposed project are less than significant due to the low sensitivity of alluvial and beach deposits and the unlikelihood of finding resources in these recent deposits. No significant impacts to paleontological resources have been identified under Alternative 1 or the proposed project. Therefore, no mitigation measures are required. No adverse effects have been identified.

4.11 VISUAL RESOURCES

This section describes the existing visual environment and aesthetic character of the project area and adjacent beach nourishment site, then evaluates changes associated with implementation of the proposed project and alternatives. Pertinent policies and regulations related to visual resources are summarized as well. Information is also referenced from the Feasibility Study throughout the discussion (Tierra Environmental Services 2008).

4.11.1 Affected Environment

Visual resources are composed of natural and built features that give a particular area its aesthetic qualities. These features form landscape character, or the overall impression an observer perceives of an area. Landforms, water surfaces, vegetation, and built features are part of the landscape character.

Regulatory Setting

The following laws, regulations, policies, and plans are applicable to this resource area:

- Comprehensive Management Plan
- Department of Parks and Recreation Operations Manual
- California Coastal Act (Chapter 3, Article 6, Section 30251)

The study area for visual impacts includes Tijuana Estuary and adjacent landscape (about 1 mile distant) where there are public and private views of the estuary and proposed restoration area. Tijuana Estuary is located in south coastal San Diego County and appears as a large, low-lying natural feature, generally bounded to the south by the international border, which is characterized by hillsides that rise from the flat floodplain. Residential and commercial development line the hillsides along the border, including a fairly large stadium at the edge of the beach in Tijuana, Mexico. To the west of the project site is the beach and expanse of the Pacific Ocean. The City of Imperial Beach is to the north with mostly residential and commercial uses, including the Naval Outlying Landing Field and the Visitor Center (north of Oneonta Slough). The general Tijuana River Valley system is located east of the project site where land uses such as agricultural, residential areas, and open space gradually migrate into upland/hillside areas. Since the project and placement sites are located in the southern portion of the estuary, this area is the focus of the visual analysis.

A large portion of the project site is covered with wetland and upland vegetation of varying hues of green with seasonal yellow and reddish cast (in the autumn and winter). Vegetated areas are interspersed with disturbed lands within the project site, and areas of bare ground provide more

brown and earth tones. Several trails are visible within and south of the project site (e.g., Beach Trail, Marsh Trail) and appear as linear features that crisscross vegetated and disturbed areas.

The mouth of the estuary appears as a mosaic of open water intermixed with sand, unvegetated mudflats in earth tones, and low-growing vegetation. The area around the river mouth presents muted colors and rounded elements with low to moderate contrasts between elements. The adjacent beach nourishment site is west of the proposed project and is characterized by a generally sandy beach that varies in width both annually and seasonally. Conditions at the beach are dynamic and depend on coastal processes (e.g., wave energy and storm event frequency and severity). This barrier beach is unique in the sense that dune habitat exists on this stretch of beach. However, inland migration of the barrier beach has occurred due to the effects of sea level rise, destabilization of the beach and dunes due to vegetation removal, and dune overwash during periods of severe wave action (Tierra Environmental Services 2008). Beach users can access Coast Trail North/South, located south of the mouth of the estuary, which runs north to south along the barrier beach, via Beach Trail. The coastline north of the river mouth has had periodic beach nourishment from projects like the RBSP in 2012.

No source of lighting is available within the estuary. Adjacent commercial, residential, and military land uses contribute to the ambient lighting and brightness levels in the project area, including sources of light from the international border and Mexico. Generally, the major sources of illumination on the beach nourishment site and nearby river mouth are from surrounding north, east, and south land uses.

4.11.2 CEQA Thresholds of Significance

Would the project:

a) Have a substantial adverse effect on a scenic vista or on valued focal points from public roads, trails, scenic highways, or recreational areas;

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;

c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings; or

d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

4.11.3 Environmental Evaluation

The 1991 TETRP EIR/EIS concluded that constructing Model Marsh would not result in visual impacts. However, it found that implementation of the 495-acre restoration project could result in a potentially significant permanent impact to aesthetics with construction of an erodible berm or

levee. The visual analysis concluded that an erodible berm or levee would disrupt the present visual aesthetics of the river valley floodplain even when vegetated with native species, as proposed as part of the previously identified mitigation measure, to lessen contracts between the structure and surrounding areas. Since TETRP II Phase I evaluated in this tiered document is not proposing such structures, the potentially significant impact identified in the 1991 TETRP EIR/EIS would not result with implementation of TETRP II Phase I.

Restoration and enhancement would temporarily affect the visual environment during the construction time period. Alternative 1 and the proposed project would generate material that would be placed in various locations, including beach sites (where appropriate). The significance of this visual change depends on a variety of factors, including the degree to which TETRP II Phase I would be seen by potentially sensitive viewers, viewer attitudes and activities, the distance from which the project would be observed, and the extent the project would be consistent with established visual quality goals of the estuary.

The anticipated visual impact of TETRP II Phase I is assessed qualitatively below. Three levels of contrast were considered: weak, moderate, and strong. Weak contrast means minor or low visual contrast with the surrounding landscape, while strong contrast means the facilities would be highly evident or dominate a setting. Moderate contrast would be noticeable but not dominant. Each alternative was also considered in terms of conformance with applicable goals and policies in the estuary.

Visual sensitivity is dependent upon viewer attitudes, the types of activities in which people are engaged when viewing the project, and the distance from which the project would be seen. Overall, higher degrees of visual sensitivity are correlated where people are engaged in outdoor recreational pursuits in public places, or participate in scenic or pleasure driving. Conversely, visual sensitivity is considered low to moderate in industrial or commercial areas where the scenic quality of the environment does not affect the value of the activity.

For the restoration and enhancement evaluation, sensitive viewers are identified as users of recreation areas at or near the estuary and beach users. For the beach nourishment evaluation, sensitive viewers are identified as public beachgoers and recreational users. Four key views are identified for evaluation (Table 4.11-1) and shown in Figure 4.11-1.

Table 4.11-1
List of Key Views

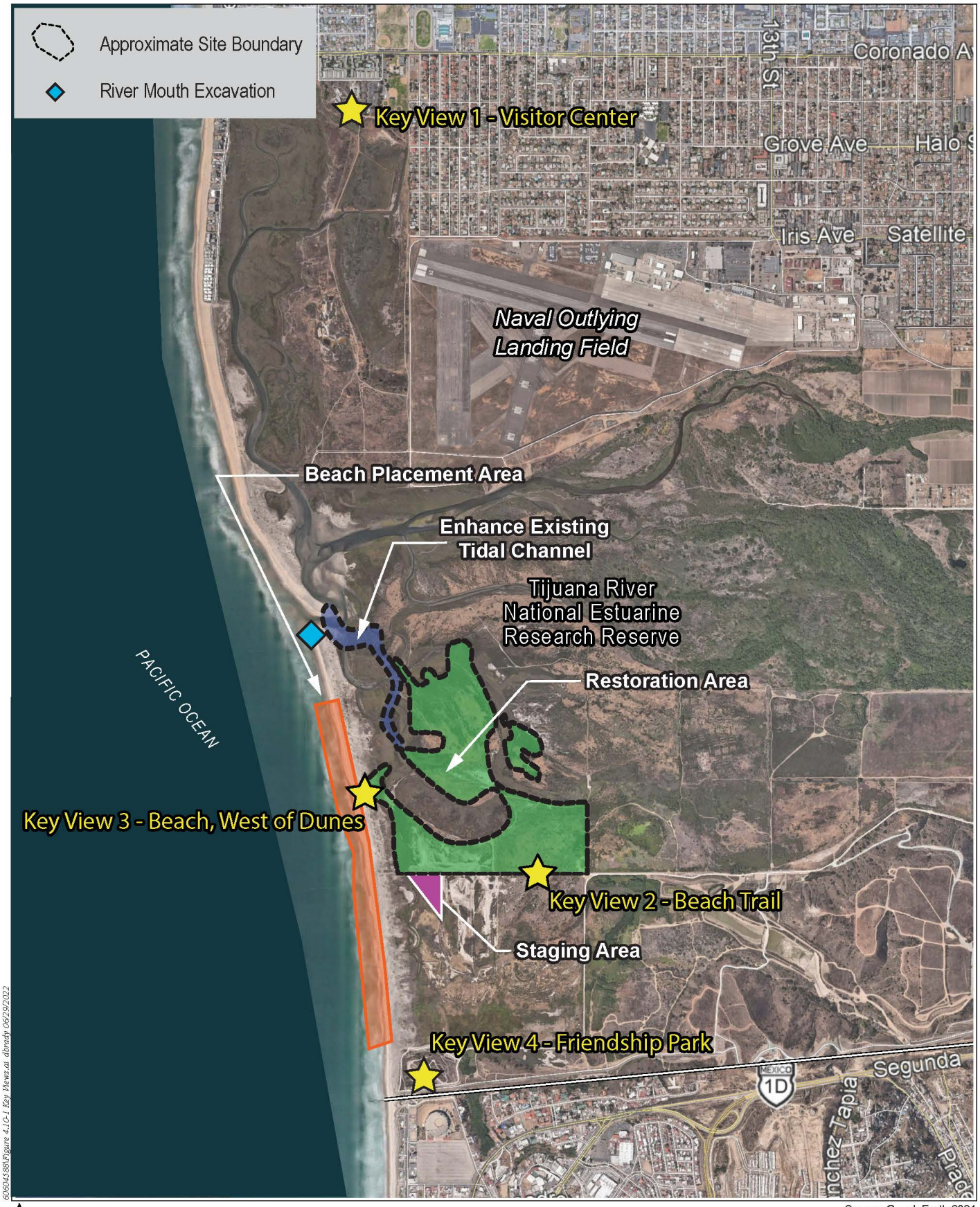
Key View Number	Location	Representative Views	Sensitivity
Key View 1	Visitor Center	Recreation	High
Key View 2	Beach Trail	Recreation, public and equestrian access	Moderate
Key View 3	Beach, West of Dunes	Beach user, recreation, public access	High
Key View 4	Friendship Park	Recreation, scenic viewer	High to moderate

4.11.3.1 Restoration/Enhancement

Alternative 1

During the construction phase, the visual character of the project site would change substantially from existing conditions. Soil and vegetation would be removed from a large portion of the project site and landform alteration would occur. Temporary visual changes within the estuary during the construction phase would include the presence of construction equipment, such as bulldozers, heavy trucks, and other standard equipment operating on land; a floating dredge operating on the water; equipment and materials stored in staging and laydown areas; general disturbance of soils and vegetation to alter elevations to support the proposed habitat distribution; and other typical construction activity.

The estuary and surrounding river valley areas have a high visual value due to the natural and open space aesthetic and unique habitat and conditions specific to the estuary setting. The construction-related changes would include dredging/grading and construction activity within the estuary and beach. These temporary activities would be highly evident at Key Views 2 and 4. Construction activities and temporary disturbances to visual aesthetics within the project site would likely not be visible from Key View 1 at the northern end of the estuary. Due to the elevation difference, viewers at the beach (Key View 3) would likely not be able to see the changes to the project site. Viewers at the Friendship Park vista point (Key View 4) would experience a strong contrast due to extended views of construction activities from this mesa viewpoint and an expectation of seeing the estuary and river mouth in its natural condition from this site. Throughout Alternative 1 implementation, construction equipment and activities would be visible at some locations within the estuary area (e.g., construction material at the staging area, temporary stockpiles, equipment operating within the estuary and river mouth). However, broad views of the Pacific Ocean and overall river valley in the distance would continue. Users of the trails and beaches (Key Views 2 and 4) would experience a strong, short-term contrast because of the overall change and likely perceived degradation in visual character. Overall, the construction phase would represent a temporary change in the visual quality and character of the estuary for key viewers. Construction



Source: GoogleEarth 2021

0 2,000 Feet

AECOM
San Diego County, California
TETRP II Phase I EIR/EIS

FIGURE 4.11-1 - KEY VIEWS

60604588\Figure 4.10-1 Key Views.ai dbrady 06/29/2022

would occupy a relatively small portion of the overall estuary setting and visual environment and, once construction is complete, the scenic quality of the estuary and project site would return to conditions similar to the current visual environment. To further reduce the effect of the visual changes on trail users and at key viewpoints, signage would be posted prior to the start of construction to notify people of the presence of construction equipment and duration of construction, and are aware of the purpose of the activities as required by PDF-1.

Therefore, because of the temporary nature of the visual disruption, the short-term visual impact for trail users is considered less than significant pursuant to CEQA (CEQA Criteria A and C), and no significant visual impacts would occur pursuant to NEPA.

Over 5–10 years post-restoration, as vegetation in the estuary becomes reestablished at the new elevations/grade, the visual character of the estuary would become similar to the northern arm of the estuary, and would host a wider variety of native vegetation and wetland habitats of visual interest as compared to existing conditions at the project site. Vegetation would establish due to active restoration (planting plants) as well as natural recruitment. It is likely that more open water would be visible in the project site resulting in an increase in the tidal prism, and a mosaic of water, mudflats, and vegetation would be established. Users of the trails and beach areas (Key Views 2 and 3) as well as persons at the Friendship Park vista point (Key View 4) would experience an open, natural system similar in character to the present condition within the northern portion of the estuary. The increased habitat diversity may be even more interesting and appealing to trail users and beach.

Current periodic river mouth excavation would continue to occur under Alternative 1 and would be similar to current activities undertaken by the USFWS. Construction equipment would temporarily contrast against the visual setting; however, the majority of the estuary would be unaffected during river mouth excavation activities. **The periodic excavation in the river mouth as proposed under Alternative 1 would not result in any long-term visual impacts; therefore, no significant visual impacts pursuant to CEQA (CEQA Criteria A and C) or NEPA would occur.**

The restoration and enhancement and river mouth areas are not located along a designated state scenic highway (Caltrans 2021). **Therefore, no impacts on scenic resources within a state scenic highway would occur pursuant to CEQA (CEQA Criterion B) or NEPA.**

Alternative 1 would result in some temporary new light sources during construction activities, but they would be periodic and small scale. Construction activities are anticipated to occur Monday through Friday from 7:00 a.m. to 6:00 p.m. Lighting sources would likely not be required for the majority of the construction day, except for potential short periods in the early morning or evening, or potentially for focused security during nighttime hours. The light sources necessary during these

hours would be localized and focused on the immediate work area. No permanent new source of lighting would be created under Alternative 1. For these reasons, a new source of substantial light or glare would not occur. **Therefore, no significant impacts pursuant to CEQA (CEQA Criterion D) or NEPA would occur.**

Proposed Project

Construction of the proposed project would be similar to Alternative 1. The construction activities for the proposed project would be visible at Key Views 2, 3, and 4. Viewers at the Visitor Center (Key View 1) would not be able to see changes during construction activities such as equipment or graded areas. Viewers along Beach Trail and located at the beach east of the project site (Key Views 2 and 3) would observe construction equipment in the estuary and along the beach. Viewers at Key View 4 (hilltop vista point at Friendship Park) and users of the trail system and beach (Key Views 2 and 3, respectively) would experience a short-term contrast because of the overall change and likely perceived degradation in visual character, but also because they have higher scenic expectations. Throughout implementation of the proposed project, construction equipment and activities would be visible at some locations within the estuary area and beach while operating equipment, excavating the river mouth, and using the construction staging area. The visual impacts to these sensitive viewers would be temporary, as they would occur during project construction and would cease when the proposed project is built. Signage would be posted, notifying recreational users of the proposed construction, presence of equipment, and purpose of activities, as required by PDF-1. **Since visual impacts during construction would be temporary, they would be considered less than significant under CEQA (CEQA Criteria A and C) and no significant impacts would occur pursuant to NEPA.**

The post-restoration views under the proposed project would be different, but would be compatible with the surrounding landscape and satisfy expectations of viewers on trails, at scenic view points, and at the beach. Post-restoration views would continue to include wetland habitats and other flora and fauna associated with the estuary and expected by recreational viewers. The proposed project would modify habitat distributions in the estuary, which could modify viewer experience as the balance of open areas, habitat types, and open water areas would be altered from existing conditions. While this is a modification from the existing aesthetic, it is in character with the visual environment expected of an estuary setting and would not result in a deteriorated or highly modified viewing experience.

The existing river mouth would remain the same in character as existing conditions. Periodic river mouth excavation would be very similar to efforts that currently occur at the existing river mouth, which is moderately visible to beachgoers. The temporary contrast of the construction equipment in this visual setting would be moderate and the vast majority of the estuary would remain unaffected during excavation of the river mouth. **For these reasons, permanent visual impacts**

would be less than significant under CEQA (CEQA Criteria A and C) and no significant effects would occur pursuant to NEPA.

Similar to Alternative 1, restoration and enhancement and river mouth activities associated with the proposed project are not located along a designated state scenic highway (Caltrans 2021). **Therefore, no impacts to scenic resources within a state scenic highway pursuant to CEQA (CEQA Criterion B) or NEPA would occur.**

The discussion of temporary light and glare provided under Alternative 1 would also apply to the proposed project. Implementation of the proposed project would not result in new permanent lighting sources. **Therefore, no impacts related to light and glare pursuant to CEQA (CEQA Criterion D) or NEPA would occur.**

No Project/No Action Alternative

The No Project/No Action Alternative would not result in modifications to the estuary or river mouth and would not require beach nourishment. No change would occur to existing conditions or resources. Under this alternative, the estuary would remain a predominantly fragmented salt marsh system with sedimentation continuing to encroach into the project site. While this may reduce habitat diversity and present a visually monotypic form over time compared to the built alternatives, the general open space aesthetic would remain, and the visual contrast would be weak relative to adjacent wetlands. **Therefore, no impact to visual resources pursuant to CEQA (CEQA Criteria A, B, C, and D) or NEPA would occur because the project area would remain unchanged from its existing condition.**

4.11.3.2 Soil Management

Depending on the quality of materials to be exported, several different soil management and/or reuse scenarios are proposed. These methods include beach nourishment and off-site transport to nearby approved project sites and/or the landfill. The visual changes associated with the beach nourishment component would primarily include construction equipment on the beach and hauling trucks using trails to transport material. This would occur during construction activities and would cease when placement is completed, resulting in temporary visual impacts. Construction and hauling equipment, as well as temporary stockpiles within the project footprint, would be temporarily visible to various beachgoers, viewers on the higher areas surrounding the project site, and recreational users along trails from Key Views 2, 3, and 4. Recreational trail users at the Visitor Center (Key View 1) may be able to see construction equipment and activity but this would be dependent on viewpoints from specific locations along the trail network and would likely be at a distance from the river mouth. Beaches in the vicinity of the estuary (particularly to the north of the river mouth) have been recipients of beach nourishment in the past as part of the 2001 RBSP

or 2012 RBSP, current river mouth excavation activities, or other beach nourishment programs. The visual occurrence of construction equipment on these beaches is not highly uncommon to these locations or associated viewers.

Once beach nourishment is completed, the placement material would be similar to the existing beach; potential discoloration of the soil would be short term (typically 1 to 4 years), and would not cause a substantial degradation of the overall sandy beach appearance. The placement material would be washed by waves, exposed to the sun, and eventually mixed with the existing sand to minimize potential contrast. This nourishment material is a beneficial enhancement of the beach because sand is preferable both visually and recreationally. Periodic river mouth excavation would continue to occur and would be similar to existing efforts. Construction equipment used to complete river mouth excavation would temporarily contrast against the visual aesthetic of the beach, but the majority of the estuary would remain unaffected by these activities. **The short-term nature of the activities and the visual memory of intermittent similar activities would result in less than significant impacts to beachgoers pursuant to CEQA (CEQA Criteria A and C), and no significant effects to beachgoers would occur pursuant to NEPA.**

Proposed beach nourishment is not located on or near a designated state scenic highway (Caltrans 2021). **Thus, no impacts on scenic resources within a state scenic highway have been identified pursuant to CEQA (CEQA Criterion B) or NEPA.**

It is anticipated that construction activities would occur during the hours of 7:00 a.m. to 6:00 p.m., including soil management. Therefore, temporary new light sources may be needed during periods of low light in the early morning and dusk hours, or for focused security during nighttime hours, and would be focused on the immediate work area for short periods of time. No permanent sources of light are proposed as part of beach nourishment. Since the lights would not create a substantial source of light, **the temporary use of night lighting for construction activities would be less than significant under CEQA (CEQA Criterion D), and no significant impacts would occur pursuant to NEPA**.

4.11.4 Avoidance, Minimization, and Mitigation Measures

Impacts to visual resources are less than significant due to the temporary nature of impacts during construction. No significant impacts have been identified under Alternative 1 or the proposed project; therefore, no mitigation measures are required.

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4.12 TRANSPORTATION

Implementation of the proposed project would require the use of the local circulation system for construction activities and operations. This traffic analysis considers the construction impacts to the street system due to the construction-related activities. This section is based on the traffic analysis presented in the Local Mobility Analysis (Chen Ryan 2021a) and Transportation Impact Study (Chen Ryan 2021b). Technical details of the traffic analysis and methodology are included in that report.

Local roadways in the study area vicinity would be used for transport of materials/equipment into and out of the project site and to accommodate worker trips during construction. Excavated material removed from the project site would be transported to nearby approved locations using Monument Road, Hollister Street, Tocayo Avenue and Dairy Mart Road. Upon completion of the proposed project, generation of project-related traffic on roadways within the project area would be limited to intermittent maintenance activities. Since the proposed project is a restoration project and would not result in substantial operational impacts, this analysis focuses on construction activity and traffic impacts associated with restoration and soil management activities.

4.12.1 Affected Environment

The regulatory setting related to traffic and circulation is generally set forth through the traffic criteria adopted by local jurisdictions to define acceptable levels of operation for existing and future traffic conditions on their roadways.

Effective evaluation of the traffic impacts associated with the proposed project requires an understanding of the existing transportation system within the project study area. The transportation network facilities within the proposed project study area include the north-south roadways Hollister Street and Dairy Mart Road. East-west roads include Tocayo Avenue, San Ysidro Boulevard, and Monument Road. The project site is in a rural environment, and no pedestrian, bicycle, or transit facilities are present within a ½ mile walking distance of the proposed project.

4.12.2 CEQA Thresholds of Significance

Would the project:

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 § 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);

d) Result in inadequate emergency access; or

e) Result in substantial alterations to present circulation movements including effects on existing public access to beaches, parks, or other open space areas?

4.12.3 Environmental Evaluation

The 1991 TETRP EIR/EIS found that the implementation of the Model Project and 495-acre restoration project could result in significant short-term impacts on traffic due to increased truck trips during the duration of construction. Since the impacts would only occur during construction, there would be no long-term impacts. Mitigation for this impact specified that truck travel routes and time of travel would be determined in consultation with the City of Imperial Beach and the City and County of San Diego in an attempt to reduce the magnitude of expected impacts.

Since certification of the 1991 TETRP EIR/EIS, thresholds for how transportation is analyzed has changed under CEQA guidelines and now focuses more on vehicle miles traveled (VMT) as opposed to level of service (LOS). Additionally, the project components have changed since the previous EIR/EIS and specific project construction information relevant to the project design is now available. Thus, the analysis below reflects the exact volume of truck trips and traffic relevant to the current TETRP II Phase I. For this reason, the analysis presented in this document supersedes the traffic information presented in the 1991 TETRP EIR/EIS. However, this document contains measures very similar to the mitigation from the previous EIR/EIS as specified in the Traffic Control Plan discussion below.

This analysis evaluates the impacts of restoration/enhancement and soil management together, as this aligns with how Alternative 1 and the proposed project were analyzed within the traffic studies prepared for TETRP II Phase I (Chen Ryan 2021a, 2021b).

4.12.3.1 Restoration/Enhancement and Soil Management

Construction-generated traffic on local roadways associated with the enhancement and restoration would generally include transporting of equipment and materials, haul trips for material export, and worker trips to construction areas. Soil management activities would consist of construction-generated traffic associated with hauling material to off-site disposal locations. Conservatively, this discussion analyzes the worst-case scenario involving materials disposal to the farthest off-site location (i.e., Otay Landfill). To perform this conservative analysis, the traffic studies analyzed projected construction trips from restoration/enhancement and soil management activities together, and incorporated a passenger car equivalency factor as is standard practice. Including this passenger car equivalency factor accounts for potential travel delays related to trucking vehicles, since large haul trucks are slower than typical passenger vehicles. Due to the nature of the restoration and enhancement projects, once construction is complete additional traffic trips would be minimal. Occasional maintenance operations may be required but would be minimal. In addition, actions

proposed as part of the estuary restoration and enhancement are not anticipated to include the construction of substantial structures. Therefore, the following discussion focuses on short-term impacts during temporary construction activities.

Alternative 1

Impacts to the transportation system are analyzed in two parts depending on current roadway conditions, the first of which analyzes whether Alternative 1 would add greater than 50% average daily trips (ADT) to an already failing roadway segment. The second discussion analyzes, for currently well-operating roadway segments, whether Alternative 1 would cause these roadway segments to operate poorly. The need for off-site improvements to accommodate project traffic would be determined by this two part analysis, as recommended by the City of San Diego Transportation Study Manual (Chen Ryan 2021 a). Existing and near-term traffic conditions for roadway segments analyzed for TETRP II Phase I are included in Table 4.12-1 below.

Table 4.12-1
Existing and Near-term Traffic Conditions for Roadways at the Project Site

Roadway	Segment	Roadway Capacity[1]	ADT (Existing)	ADT (Near-term year 2024)	ADT (Near-term year 2024 and TETRP II Phase I)
Hollister Street	Tocayo Avenue to Sunset Avenue	10,000	3,041	3,060	3,060
Hollister Street	Sunset Avenue to Monument Road	10,000	1,368	1,380	1,380
Dairy Mart Road	San Ysidro Blvd. to I-5 Southbound Ramps	15,000	18,959	19,080	19,369
Dairy Mart Road	I-5 Southbound Ramps to Servando Avenue	11,000	15,497	15,600	16,178
Dairy Mart Road	Servando Avenue to Camino De La Plaza	10,000	10,357	10,420	10,998
Dairy Mart Road	Camino De La Plaza to Monument Road	10,000	1,077	1,090	1,668
Tocayo Avenue	Hollister Street to Oro Vista Road	40,000	11,073	11,140	11,140
Tocayo Avenue	East of Oro Vista Road	40,000	21,769	21,910	21,910
San Ysidro Boulevard	Dairy Mart Road to I-5 Northbound Ramps	30,000	21,909	22,050	22,339
Monument Road	West of Hollister Street to Hollister Street	10,000	623	630	1,208
Monument Road	Hollister Street to Dairy Mart Road	10,000	1,077	1,090	1,688

[1] Roadway capacity shown for LOS E.

Based on the Local Mobility Analysis, three currently failing roadway segments have been identified along designated access/haul routes. Two of these roadway segments are southbound ramps that

would not be utilized by the project, and the other segment is Dairy Mart Road – Servando Avenue to Camino De La Plaza (Chen Ryan 2021a). The remaining roadway segments listed in Table 4.12-1 are considered well-operating roadway segments. For currently failing roadway segments, construction trips from restoration/enhancement and soil management activities do not add greater than 50% of the ADT (Chen Ryan 2021a). TETRP II Phase I is anticipated to add 578 ADT, as analyzed in the traffic study, which is below 50% of the existing and near-term traffic conditions for currently failing roadway segments shown in Table 4.12-1 (Chen Ryan 2021a). For currently well-operating roadway segments, construction trips associated with restoration/enhancement and soil management activities for Alternative 1 would not lead these roadway segments to operate poorly as roadway capacities can accommodate the temporary increase in transportation volumes associated with implementation of Alternative 1 (Table 4.12-1).

As mentioned above, this analysis represents a worse-case scenario with the assumption that 580,000 cy of materials excavated from the project site would be disposed of at the farthest off-site location identified (i.e., Otay Landfill) for approximately 6 months. In reality, some material may be disposed of at closer locations, such as Nelson Sloan or other approved projects, or the beach as identified under Options 3 through 5, which would reduce the duration of trucking along the haul route to approximately 5 to 2.5 months, respectively. Once hauling operations cease, the majority of construction activities would be within the estuary itself and would not extend into existing roads. Additionally, the construction trips are temporary in nature; therefore, trips would not be on the transportation network when construction is over. To minimize disruption to traffic flow from haul trips, a Traffic Control Plan (Table 3-9, Standard Construction Practices) will be prepared in association with final construction plans that will take into consideration the location(s) identified for off-site disposal of project generated soil. The Traffic Control Plan will outline traffic control measures to accommodate workers within the roadway, while facilitating continued circulation for road users (motorists, bicyclists, and pedestrians) through the work zone, and would identify how trips would be distributed among appropriate haul routes to minimize impacts to adjacent residents. No conflict would occur with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities. **Thus, impacts related to transportation plans and policies would not be significant under CEQA (CEQA Criterion A) or NEPA.**

Based upon the screening criteria from the Transportation Impact Study (Chen Ryan 2021b), the proposed project falls under the "Small Project" category as it is anticipated to generate marginal operational trips related to maintenance (less than 300 ADT) when construction is complete. Additionally, Alternative 1 is not anticipated to generate "new" VMT as the project itself is not expanding or constructing new facilities but rather restoring the existing wetlands and tidal channel, which would not affect or influence traffic generation or miles traveled. Some construction traffic would be necessary during restoration and enhancement, such as equipment import and worker trips, and during continued maintenance of the restored estuary; however, these trips would be temporary

and occur during the construction activity. CEQA Guidelines Section 15064.3, subdivision (b) outlines that VMT is the most appropriate measure of transportation impacts and states that VMT refers to the amount and distance of automobile travel attributable to a project. **Thus, because Alternative 1 would not generate new traffic or otherwise cause vehicle miles to increase, a less than significant impact related to increased VMT would result pursuant to CEQA (CEQA Criterion B) and NEPA.**

Alternative 1 would not include roadway reconfiguration or other modifications that would create dangerous roadway design features. Restoration and enhancement of the estuary would not result in new land uses or features that could cause incompatible uses on local roadways. Potential safety considerations for roadway users, including access for pedestrians, bicyclists, and vehicles traveling near the project site in conjunction with construction trips associated with implementation of restoration and enhancement activities, would be addressed in the Traffic Control Plan (Table 3-9, Standard Construction Practices). The Traffic Control Plan will address items like access and existing design features of roadways, such as narrow lanes, lack of shoulder, and blind curves, to address safety for roadway users during temporary construction activities. **No impact related to a substantial increase in hazards due to a geometric design feature or incompatible use would occur as a result of implementing Alternative 1. Therefore, impacts would be less than significant under CEQA (CEQA Criterion C) and would not be significant pursuant to NEPA.**

As discussed in Section 4.5.3.1, the construction activities at the project site would not obstruct or hinder the ability of the local transportation network and designated roads to serve emergency purposes or evacuation routes if an emergency were to occur. Implementation of the Traffic Control Plan (Table 3-9, Standard Construction Practices) would avoid the potential for disruption of the transportation system. The Traffic Control Plan will outline safety and emergency procedures to verify that adequate emergency access is available through the impacted areas. Additionally, PDF-4 provides for coordination with other agencies' emergency response personnel to provide awareness of Alternative 1 and identify appropriate emergency routes. Adequate emergency access would be maintained throughout the construction period. **A less than significant impact related to emergency access would result under CEQA (CEQA Criterion D) and no significant effects pursuant to NEPA would occur.**

During construction, access to beaches, parks, or other open space areas would remain open to the public. **Therefore, Alternative 1 would not result in substantial alterations to current circulation movements, and impacts would not be significant under CEQA (CEQA Criterion E) or NEPA.**

Proposed Project

The proposed project is similar to Alternative 1, and restoration and other enhancement efforts that would occur under the proposed project would not change or alter transportation effects as analyzed for Alternative 1 above; thus, discussions and conclusions identified under Alternative 1 are also applicable to Alternative 1. **Therefore, the proposed project would not conflict with transportation plans and policies; generate new traffic or increase vehicle miles; increase hazards due to a geometric design feature or incompatible uses; result in inadequate emergency access; or result in substantial alterations to current circulation movements. Impacts pursuant to CEQA (CEQA Criteria A through E) would be less than significant, and no significant impacts would occur pursuant to NEPA.**

No Project/No Action Alternative

Under the No Project/No Action Alternative, the proposed restoration of the estuary would not be completed and construction activities that may increase the impacts related to transportation would not occur. Under the No Project/No Action Alternative, the project site would be subject to the same traffic circulation as existing conditions. **Therefore, no impacts to transportation would occur pursuant to CEQA (CEQA Criteria A through E) or NEPA.**

4.12.4 Avoidance, Minimization, and Mitigation Measures

No significant traffic impacts have been identified; therefore, no mitigation measures are required.

4.13 AIR QUALITY

This section describes existing air quality conditions in the project site, summarizes applicable regulations, and analyzes potential short-term construction air quality impacts of the proposed project and alternatives. In addition, mitigation measures are recommended, as necessary, to reduce significant air quality impacts. Additional calculation details are included in the Air Quality Technical Memorandum (AECOM 2021b).

4.13.1 Affected Environment

Air quality is defined by the concentration of pollutants in relation to their impact on human health. Concentrations of air pollutants are determined by the rate and location of pollutant emissions released by pollution sources, and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, and sunlight. Therefore, ambient air quality conditions within the local air basin are influenced by such natural factors as topography, meteorology, and climate, in addition to the amount of air pollutant emissions released by existing air pollutant sources.

The proposed project is located within the San Diego Air Basin (SDAB). The SDAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the west and high mountain ranges to the east. The topography in the SDAB region varies greatly, from beaches on the west, to mountains and then desert to the east.

The climate of the SDAB is characterized by warm, dry summers and mild winters. One of the main determinants of its climatology is a semi-permanent high-pressure area in the eastern Pacific Ocean. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the region, causing widespread precipitation. The normal annual precipitation in the SDAB, as reported at the nearest station to the project site (Chula Vista, Station 041758), occurs primarily from October through April and is approximately 10 inches (WRCC 2016). Normal January temperatures range from an average minimum of 44 degrees Fahrenheit (°F) to an average maximum of 64°F, and August temperatures range from an average minimum of 64°F to an average maximum of 74°F (WRCC 2016).

Regulatory Setting

The following list includes laws, regulations, policies, plans, and programs that are applicable to this resource area.

- Clean Air Act
- California Clean Air Act

- Tanner Air Toxics Act
- Air Toxics Hot Spots Information and Assessment Act

In the SDAB, the San Diego Air Pollution Control District (SDAPCD) is the agency responsible for protecting public health and welfare through the administration of federal and state air quality laws and policies. Included in the SDAPCD's tasks are monitoring of air pollution, preparation of air quality plans, and promulgation of rules and regulations. SDAPCD rules relevant to the project include, but are not limited to:

- Regulation IV (Prohibitions), Rule 50: Visible Emissions
- Regulation IV (Prohibitions), Rule 51: Nuisance
- Regulation IV (Prohibitions), Rule 52: Particulate Matter
- Regulation IV (Prohibitions), Rule 54: Dust and Fumes
- Regulation IV (Prohibitions), Rule 55: Fugitive Dust Control

Criteria Air Pollutants

Individual air pollutants at certain concentrations may adversely affect human or animal health, reduce visibility, damage property, and reduce the productivity or vigor of crops and natural vegetation. Six air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) as being of concern at both the nationwide and statewide levels: ozone; carbon monoxide (CO); nitrogen dioxide (NO_2); sulfur dioxide (SO_2); lead; and particulate matter (PM), which is subdivided into two classes based on particle size: PM equal to or less than 10 micrometers in diameter (PM_{10}) and PM equal to or less than 2.5 micrometers in diameter ($PM_{2.5}$). Since the air quality standards for these air pollutants are regulated using human health and environmentally based criteria, they are commonly referred to as "criteria air pollutants." A brief description of each criteria air pollutant and the attainment status for SDAB is provided in Table 4.13-1

Both EPA and CARB use ambient air quality monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify the areas with air quality problems and initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. An "attainment" designation for an area signifies that pollutant concentrations did not exceed the established standard. In most cases, areas designated or redesignated as attainment must develop and implement maintenance plans, which are designed to provide continued compliance with the standard. In contrast to attainment, a "nonattainment" designation indicates that a pollutant concentration has exceeded the established standard. Finally, an unclassified designation indicates that insufficient data exist to determine attainment or nonattainment.

As shown in Table 4.13-1, the SDAB currently meets the federal standards for all criteria air pollutants except ozone, and meets the state standards for all criteria air pollutants except ozone, PM_{10}, and $PM_{2.5}$. On June 2, 2021, the EPA published a final rule in the FR approving a request from the State of California to reclassify the San Diego County ozone nonattainment area from "Serious" to "Severe" for the 2008 ozone National Ambient Air Quality Standards (NAAQS) and from "Moderate" to "Severe" for the 2015 ozone NAAQS.

Table 4.13-1
Description of Criteria Air Pollutant Sources and Attainment Status

Pollutant	Description/Sources	State	Federal
Ozone (O_3)	Ozone is formed in the atmosphere through chemical reactions between pollutants emitted from vehicles, factories and other industrial sources, fossil fuels, combustion, consumer products, evaporation of paints, and many other sources. Reactive organic gases or volatile organic compounds (ROG/VOC) and nitrogen oxide (NO_X) gases react in the presence of sunlight to form ozone. ROG/VOC and NO_X are called precursors of ozone.	N	N
Carbon monoxide (CO)	CO is a colorless, odorless gas. It results from the incomplete combustion of carbon-containing fuels such as natural gas, gasoline, or wood, and is emitted by a wide variety of combustion sources, including motor vehicles, power plants, wildfires, and incinerators.	A	A
Nitrogen dioxide (NO_2)	NO_2 is a pungent gas. Although NO_2 can be directly emitted from combustion sources, much of the NO_2 in the ambient air is formed in the atmosphere through reactions between nitric oxide (NO) and other air pollutants that require the presence of sunlight (photochemical reactions).	A	A
Sulfur dioxide (SO_2)	SO_2 is emitted when sulfur-containing fuel is burned. Some examples of sources include motor vehicles, locomotives, ships, and off-road diesel equipment that are operated with fuels that contain high levels of sulfur.	A	A
Particulate Matter, 10 micrometers or less in diameter (PM_{10})	Airborne particulate matter is not a single pollutant, but rather a mixture of many chemical species. It is a complex mixture of solids and aerosols composed of small droplets of liquid, dry solid fragments, and solid cores with liquid coatings. Emissions from combustion of gasoline, oil, diesel fuel or wood produce much of the PM_{10} pollution found in outdoor air. PM_{10} also includes dust from construction sites, landfills and agriculture, wildfires and brush/waste burning, industrial sources, wind-blown dust from open lands, pollen and fragments of bacteria.	N	U
Particulate Matter, 2.5 micrometers or less in diameter ($PM_{2.5}$)	Fine particles, such as those found in smoke and haze, are $PM_{2.5}$. Sources of fine particles include types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes.	N	A
Lead	Lead is a relatively soft and chemically resistant metal. Lead forms compounds with both organic and inorganic substances. In the past, motor vehicle exhaust was the major source of lead emissions to the air. Since lead has been removed from gasoline, air emissions of lead from the transportation sector, and particularly the automotive sector, have greatly declined. The major sources of lead emissions today are ore and metals processing, particularly lead smelters, and piston-engine aircraft operating on leaded aviation gasoline.	A	A

Source: CARB 2020; SDAPCD 2021
Notes: N = nonattainment; A = attainment; U = unclassified; U/A = unclassified/attainment

Toxic Air Contaminants

In addition to criteria pollutants, both federal and state air quality regulations also focus on toxic air contaminants (TACs). TACs can be separated into carcinogens and noncarcinogens based on the nature of the effects associated with exposure to the pollutant. TACs may be emitted by stationary or mobile sources. Common stationary sources of TAC emissions include gasoline stations, dry cleaners, and diesel backup generators, which are subject to local air district permit requirements. The other, often more substantial, sources of TAC emissions are motor vehicles on freeways, high-volume roadways, or other areas with high numbers of diesel vehicles, such as distribution centers. Off-road mobile sources are also major contributors of TAC emissions and include construction equipment, ships, and trains.

Particulate exhaust emissions from diesel-fueled engines (diesel PM) were identified as a TAC by CARB in 1998. Diesel engines tend to produce a much higher ratio of fine particulates than other types of internal combustion engines. The fine particles that make up diesel PM tend to penetrate deep into the lungs, and the rough surfaces of these particles makes it easy for them to bind with other toxins within the exhaust, thus increasing the hazards of particle inhalation. Federal and state efforts to reduce diesel PM emissions have focused on the use of improved fuels, adding particulate filters to engines, and requiring the production of new-technology engines that emit fewer exhaust particulates.

The nearest monitoring stations for which the SDAPCD samples for TACs, are the El Cajon and Chula Vista monitoring stations. Excluding diesel PM, data from these stations indicate that the background cancer risk in 2018 due to TACs was 356 in one million in Chula Vista and 389 in one million in El Cajon. There is no current methodology for directly measuring diesel PM. However, CARB estimates the excess cancer risk from diesel PM in California in 2014 as 460 in a million (SDAPCD 2019).

Odor

Odors are considered an air quality issue both at the local level (e.g., odor from wastewater treatment) and at the regional level (e.g., smoke from wildfires). Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). Several examples of common land use types that generate substantial odors include wastewater treatment plants, landfills, composting/green waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging plants. Notable odors may also be generated during vegetation clearing and dredging of anaerobic soils with high contents of organic debris.

Sensitive Receptors

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. These include children, the elderly, people with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Air quality regulators typically define sensitive receptors as schools, hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. Residential areas are also considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to pollutants present. Recreational land uses are considered moderately sensitive to air pollution.

The project site is primarily open space without extensive human development or use. The project site provides recreational opportunities, but these are limited to pedestrian and equestrian use. The nearest sensitive receptors to the project site are located approximately 3,380 feet east of the project site (i.e., Tijuana River Valley Regional Park Campground). In addition, several residences are located at varying distances (generally 75 feet or more) from the proposed haul route along Monument Road.

4.13.2 CEQA Thresholds of Significance

Would the project:

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?

These significance thresholds were derived from Appendix G of the CEQA Guidelines. As stated in Appendix G, the significance criteria established by the applicable air quality management board or air pollution control district may be relied on to make the impact determinations for specific program elements. SDAPCD has not developed quantitative significance thresholds for CEQA projects. However, San Diego County has established recommended screening level thresholds of significance for regional pollutant emissions. Since SDAPCD does not have quantitative significance thresholds, the San Diego County screening thresholds of significance for regional pollutant emissions were used to analyze the impacts of the project. A project with emissions rates below these thresholds is considered to have a less than significant impact on regional and local air quality throughout the SDAB. The County of San Diego Guidelines for Determining Significance and Report Format and

Content Requirements, Air Quality (2007), which outline these screening level thresholds, state that a project that results in an emissions increase less than these levels would not:

- cause a violation of a state or national ambient air quality standard anywhere that does not already exceed such standard,
- cause additional violations of a national ambient air quality standard anywhere the standard is already being exceeded,
- cause additional violations of a state ambient air quality standard anywhere the standard is already being exceeded, or
- prevent or interfere with the attainment or maintenance of any state or national ambient air quality standard.

Therefore, for CEQA purposes, these screening level thresholds can be used to demonstrate that a project's total emissions would not result in a significant impact to air quality. Since regional air quality standards have been established for these criteria pollutants to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution, these trigger levels can also be used to assess project emissions and inform the project's impacts to regional air quality and health risks under CEQA. The screening level thresholds are shown in Table 4.13-2

Table 4.13-2
Regional Pollutant Emission Screening Level Thresholds of Significance

Description	VOC[1]	NO_X[1]	CO	SO_X	PM_{10}	$PM_{2.5}$
Pounds per Day	75	250	550	250	100	55
Tons per Year	13.7	40	100	40	15	10

Notes: VOC = volatile organic compounds; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less, $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less

[1] Ozone is not emitted directly into the air but is formed through a series of reactions involving VOCs and NO_X in the presence of sunlight. VOC and NO_X are referred to as "ozone precursors." Since ozone is not directly emitted, air quality regulations focus on reducing the ozone precursors of VOC and NO_X.

Source: County of San Diego 2007

This analysis does not include lead because little to no quantifiable and foreseeable emissions of these substances would be generated by the project. Lead emissions have substantially decreased due to the near elimination of leaded gasoline fuel use.

NEPA Impact Analysis

NEPA analysis for air quality impacts is provided separately from the CEQA analysis. The General Conformity Rule (40 CFR § 51.851 and 93.150–93.160) requires any federal agency responsible for an action in a federal nonattainment or attainment/maintenance area to demonstrate conformity to the

applicable State Implementation Plan (SIP). To do so, the federal agency must determine that the action is either exempt from General Conformity Rule requirements or subject to a formal conformity determination. Conformance to the SIP is demonstrated by obtaining appropriate permits from SDAPCD, or by demonstrating that emissions would be less than de minimis levels. The conformity determination process is intended to demonstrate that the proposed federal action would not cause or contribute to new violations of federal air quality standards, increase the frequency or severity of existing violations of federal air quality standards, and delay the timely attainment of federal air quality standards. The guidance states that the applicability analysis can be (but is not required to be) completed concurrently with analysis required under NEPA. If the regulating federal agency determines that the General Conformity regulations do not apply to the federal action, no further analysis or documentation is required. Analysis required by the General Conformity Rule focuses on the net increase in emissions compared to ongoing historical conditions. Existing SIPs are presumed to have accounted for routine, ongoing federal agency activities. Conformity analyses are further limited to those direct and indirect emissions over which the federal agency has responsibility and control.

General conformity de minimis levels are appropriate measures for determining whether the proposed project could result in an exceedance of any NAAQS and evaluating air quality impacts under NEPA. A NEPA air quality evaluation differs from the General Conformity analysis in that all project criteria pollutant emissions are considered: emissions for pollutants where the area has attained the NAAQS, as well as emissions for pollutants where the region is currently designated as a nonattainment or maintenance area. Therefore, in the SDAB, project attainment emissions of SO_X, PM_{10}, and $PM_{2.5}$, would be considered for impact significance under NEPA for air quality in addition to CO, VOC, and NO_X considered under General Conformity. The total annual direct and indirect project emissions of attainment pollutants, as well as the emissions of nonattainment/maintenance pollutants (analyzed for General Conformity) from project construction and operation activities would be compared against the de minimis levels for the attainment status of these pollutants. The applicable de minimis thresholds for the project emissions generated in the SDAB are shown in Table 4.13-3.

4.13.3 Environmental Evaluation

The 1991 TETRP EIR/EIS evaluated air quality impacts from construction activities associated with the Model Project and 495-Acre Restoration Project. However, emissions were not estimated and mitigation measures were described to be developed in coordination with the air pollution control district during the “authority to construct” permit application process. As described above, in 2007 the County of San Diego adopted thresholds of significance to evaluate a project’s regional and air quality impact. Therefore, TETRP II Phase I currently under evaluation in this tiered document will not rely on previous analysis, significance conclusions, or mitigation measures.

Table 4.13-3
Applicable General Conformity De Minimis Levels

Description	VOC[1]	NO_X[1]	CO[2]	SO_X[3]	PM_{10}[3]	$PM_{2.5}$[3]
Tons per Year	25	25	100	100	100	100

Notes: VOC = volatile organic compounds; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less, $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less
[1] The SDAB is classified as a Severe Nonattainment area for ozone.
[2] The SDAB is classified as a maintenance area for CO.
[3] The SDAB is classified as an attainment or unclassified area for SO_X, PM_{10}, and $PM_{2.5}$. Although the General Conformity thresholds are not applicable, the de minimis levels for maintenance areas for these pollutants are used to provide an analysis under NEPA.
Source: County of San Diego 2007

This analysis focuses on the criteria pollutant emissions resulting from construction of the proposed project alternatives. The analysis includes estimates of emissions associated with construction equipment, worker vehicle trips, and material excavation quantities. Emissions from the operation of diesel-fueled off-road equipment were estimated by multiplying peak daily usage (i.e., hours per day) by equipment-specific emission factors and equipment-specific load factors consistent with CARB's off-road mobile source emission inventory model, OFFROAD2017. Criteria air pollutant emissions from on-road motor vehicles were estimated using EMFAC2021 mobile source emission factors. Emissions from harbor craft, including the dredge and workboat, were estimated using Sacramento Metropolitan Air Quality Management District's (SMAQMD) Harbor Craft, Dredge and Barge Emission Factor Calculator. Emissions were estimated by multiplying peak daily usage by the emission factors provided by the SMAQMD Harbor Craft Calculator, which provides emission factors from marine equipment based on the anticipated horsepower of the engines and default values for engine model years and load factors. The anticipated construction equipment usage was estimated based on data provided in the Tijuana Estuary Tidal Restoration Program II Phase 1 Construction Methods and Soil Management Report (Anchor QEA 2021a). Haul truck trips were based on the anticipated material export quantities, truck trip estimates described in Section 3.3.2, and a 16-cy capacity haul truck.

Fugitive PM dust emissions are primarily associated with site preparation and grading activities and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and miles traveled by construction vehicles on- and off-site. Fugitive dust emissions are associated with the use of construction equipment on unpaved surfaces, material dumping, and worker vehicle trips to the site. Since the majority of the construction activities for the project alternatives would occur within Tijuana Estuary, the soil would contain moisture, minimizing fugitive dust emissions. Based on a study that sampled soil moisture and soil salinity in the upper intertidal marshes in southern California, including the Tijuana River National Estuarine Research Reserve, the average soil moisture was assumed to be 35% (Noe and Zedler 2001). The primary source of fugitive

dust emissions for the project would be related to travel of heavy-duty vehicles on the unpaved portion of Beach Trail. Dust emissions were estimated using regional silt loading emission factors from EPA's Compilation of Air Pollutant Emission Factors (AP-42), including number of vehicles, vehicle weight, and VMT per day.

This analysis evaluates the impacts of restoration/enhancement and soil management together. The finding of significance for the CEQA and NEPA thresholds cannot be determined separately and must be based on emissions for the entire project as activities associated with restoration and beach nourishment would overlap.

4.13.3.1 Restoration/Enhancement and Soil Management

Alternative 1

As described in Section 4.13.2, there are four criteria to determine a project's impact to air quality under CEQA. Under the first criterion, project consistency is based on whether Alternative 1 would conflict with or obstruct implementation of the applicable air quality plan. Air quality plans describe air pollution control strategies to be implemented by a city, county, or regional air district. The primary purpose of an air quality plan is to bring an area that does not attain the federal and ambient air quality standards into compliance with those standards pursuant to the requirements of the Clean Air Act and California Clean Air Act. Nonattainment areas must submit an SIP outlining the combination of local, state, and federal strategies aimed at bringing the area into attainment. To address this requirement, the SDAPCD updated its Attainment Plan for the 2008 Eight-Hour Ozone Standard (Attainment Plan) in October 2020 and Regional Air Quality Strategy (RAQS) in 2016.

A project's consistency with the RAQS and Attainment Plan is based on whether the project would exceed the estimated air basin emissions. Emission forecasts rely on projections of VMT by the Metropolitan Planning Organizations, such as San Diego Association of Governments (SANDAG), and population, employment, and land use projections made by local jurisdictions. Alternative 1 is primarily a construction project that would involve temporary off-road and on-road construction equipment operations. Alternative 1 would not develop land uses (e.g., residential or commercial) that would increase activities and/or emissions associated with on-road mobile sources. The use of construction equipment in the RAQS is estimated for the region on an annual basis, and construction-related emissions are estimated as an aggregate in the RAQS. Alternative 1 would not increase the assumptions for off-road equipment use in the RAQS. On-road trip generation would also occur during construction of Alternative 1. Since trip generation associated with construction would be temporary and trucks would be in compliance with CARB's long-standing heavy-duty mobile source program, Alternative 1 would not increase activities and/or emissions forecasted for on-road mobile sources that have been included in the RAQS. Accordingly, implementation of Alternative 1 would not exceed the assumptions used to develop the current RAQS and would not obstruct or conflict with

the SDAPCD RAQS. In addition, as shown in Tables 4.13-4 and 4.13-5, Alternative 1 would not result in emissions that exceed thresholds for NOx and VOC; therefore, Alternative 1 would not conflict with the RAQS, which is aimed at bringing the area into attainment with the federal ozone standard. This impact would be **less than significant (CEQA Criterion A) under CEQA.**

Construction of Alternative 1 would result in the temporary generation of VOC, CO, NO_X, SO_X PM_{10}, and $PM_{2.5}$ emissions. During construction, criteria air pollutant and precursor emissions would be temporarily and intermittently generated from a variety of sources. Construction would involve a dredge, workboat, excavators, graders, bulldozers, scrapers, backhoes, and loaders. Generally, construction would occur 10 hours per day, 5 days per week over five phases, as described in Table 3-7. Additional details are included in the Air Quality Technical Memorandum (AECOM 2021b).

Tables 4.13-4 and 4.13-5 present the maximum daily and annual construction emissions, respectively, associated with restoration/enhancement and soil management under Alternative 1.

Table 4.13-4
Alternative 1 – Maximum Daily Construction-Related Emissions

Description	VOC (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	SO_X (lbs/day)	PM_{10}[1] (lbs/day)	$PM_{2.5}$[1] (lbs/day)
Maximum Daily Emissions (Restoration/Enhancement and Soil Management)	17.55	238.66	100.79	0.42	380.12	56.08
Daily Threshold	75	250	550	250	100	55
Exceeds Threshold?	No	No	No	No	**Yes**	**Yes**

Notes: VOC = volatile organic compounds; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less, $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; lbs/day = pounds per day
[1] Fugitive dust emission estimates conservatively do not include reductions associated with implementation of SDAPCD rules and regulations to minimize fugitive dust.

Table 4.13-5
Alternative 1 – Annual Construction-Related Emissions

Description	VOC (tons)	NO_X (tons)	CO (tons)	SO_X (tons)	PM_{10}[1] (tons)	$PM_{2.5}$[1] (tons)
Total Construction-Related Emissions (Restoration/ Enhancement and Soil Management)	1.69	22.76	9.90	0.04	36.18	9.99
Annual Threshold (tons/year)	13.7	40	100	40	15	10
Exceeds Threshold?	No	No	No	No	**Yes**	No

Notes: VOC = volatile organic compounds; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less, $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less
[1] Fugitive dust emission estimates conservatively do not include reductions associated with implementation of SDAPCD rules and regulations to minimize fugitive dust.

As shown in Tables 4.13-4 and 4.13-5, construction-related emissions of VOC, NO_X, CO, and SO_X would not exceed the County's screening level daily and annual thresholds and would not violate air quality standards or contribute substantially to an existing or projected air quality violation. However, construction-generated $PM_{2.5}$ emissions would exceed the County's screening level daily thresholds. PM_{10} emissions would exceed the County's daily and annual thresholds. Therefore, temporary construction emissions would have a **potentially significant impact to regional air quality under CEQA (CEQA Criterion B)**.

As described above in Section 4.13.2, for the purposes of General Conformity applicability and NEPA analysis, the project's emissions associated with restoration/enhancement and soil management activities were also compared to de minimis levels based on the air quality attainment status of the region. Table 4.13-6 summarizes the project's total criteria air pollutant emissions associated with construction of Alternative 1 for comparison to the NEPA thresholds of significance and de minimis levels.

Table 4.13-6
Alternative 1 – Annual Construction-Related Emissions
(NEPA/General Conformity Applicability Analysis)

Description	VOC (tons)	NO_X (tons)	CO (tons)	SO_X (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)
Total Construction-Related Emissions (Restoration/ Enhancement and Soil Management)	1.69	22.76	9.90	0.04	36.18	9.99
De minimis levels (tons/year)	25	25	100	100	100	100
Exceeds Threshold?	No	No	No	No	No	No

Notes: VOC = volatile organic compounds; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides;
PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less,
$PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less

As shown in Table 4.13-6, the project's total emissions would not exceed the General Conformity de minimis levels. In addition, as described in more detail in Section 4.13.4 below, emissions associated with Alternative 1 would be further reduced with implementation of Mitigation Measure AQ-1. Based on CEQA provisions that mitigation measures be required in, or incorporated into, the project (14 CCR Section 15091[a][1]), Mitigation Measure AQ-1 is considered to be a design feature of Alternative 1 for the purpose of the NEPA and General

Conformity applicability analysis. This is not considered "mitigation" under the General Conformity Rule because the rule does not apply to projects that are below de minimis levels. Therefore, temporary emissions associated with Alternative 1 would conform to the SIP, and a formal conformity analysis would not be required. **No significant air quality direct or indirect effects would occur pursuant to NEPA.**

As discussed in the Air Quality Technical Memorandum, health effects associated with ozone include respiratory symptoms, worsening of lung disease, and damage to lung tissue. In recent years, a correlation has also been reported between elevated ambient ozone levels and increases in daily hospital admission rates and mortality (EPA 2021a). VOC and NOx are precursors to ozone, for which the SDAB is designated as nonattainment with respect to the NAAQS and California Ambient Air Quality Standards (CAAQS). The contribution of VOC and NOx to regional ambient ozone concentrations is the result of complex photochemistry. The increases in ozone concentrations in the SDAB due to ozone precursor emissions tend to be found downwind of the source location because of the time required for the photochemical reactions to occur. Further, the potential for exacerbating excessive ozone concentrations would also depend on the time of year that the emissions would occur, because exceedances of the ozone NAAQS and CAAQS tend to occur when solar radiation is highest. Due to the lack of quantitative methods to assess this complex photochemistry, the holistic effect of a single project's emissions of ozone precursors is speculative.

As cited in the amicus brief filed by the South Coast Air Quality Management District (SCAQMD) in the Sierra Club v. County of Fresno (2014) 26 Cal.App.4th 704, it should be noted that it "takes a large amount of additional precursor emissions to cause a modeled increase in ambient ozone levels" (SCAQMD 2015). In addition, the SCAQMD discusses that it may be technically infeasible to accurately quantify ozone-related health impacts caused by NOx or VOC/[ROG] emissions from relatively small projects, due to photochemistry and regional model limitations (SCAQMD 2015). Further, the SCAQMD project states that a project emitting only 10 tons per year of NOx or VOC/[ROG] (same order of magnitude as the unmitigated emissions generated during construction by Alternative 1) is small enough that its regional impact on ambient ozone levels may not be detected in the regional air quality models used to determine ozone levels" (SCAQMD 2015). Further, Alternative 1's emissions would not be permanent annual emissions; Alternative 1's emissions would cease upon completion of the restoration and soil management activities. Therefore, in this case, it would not be feasible to directly correlate project emissions of NOx and VOC/[ROG] with specific health impacts from ozone. The SCAQMD explains that this is in part because ozone formation is not linearly related to emissions; ozone impacts vary depending on the location of the emissions, the location of other precursor emissions, meteorology, and seasonal impacts (SCAQMD 2015). Similarly, health effects associated with short- and long-term exposure to elevated concentrations of PM include respiratory symptoms, aggravation of respiratory and cardiovascular diseases, a weakened immune system, and cancer (WHO 2018). Although most of the effects are attributable to

PM, co-pollutant effects cannot be ruled out on the basis of existing studies. The difficulty of separating the effects may be because particulate levels co-vary with other combustion source pollutants. That is, the particle measurements serve as an index of overall exposure to combustion-related pollution, and some component(s) of combustion pollution other than particles might be at least partly responsible for the observed health effects (City of Los Angeles 2019). While directly emitted PM can have a localized impact, the tonnage emitted does not always equate to a specific local PM concentration because it can be transported long distances by wind. Secondary PM, like ozone, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as SO_X and NO_X. Due to the complexity of secondary PM formation, the tonnage of PM-forming precursor emissions in an area does not necessarily result in an equivalent concentration of secondary PM in that area. Therefore, in this case, it would not be feasible to directly correlate project mass emissions of PM with specific health impacts from PM.

In addition to criteria air pollutants, EPA and CARB regulate hazardous air pollutants, also known as TACs. The greatest potential for TAC emissions during construction would be related to diesel PM emissions associated with heavy-duty off-road equipment. The Office of Environmental Health Hazard Assessment (OEHHA) developed a Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015). According to OEHHA methodology, health effects from carcinogenic TACs are usually described in terms of individual cancer risk, which is based on a 30-year lifetime exposure to TACs. The dose of TACs is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure a person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period to a fixed amount of emissions results in a higher exposure level and higher health risks for the maximally exposed individual. Therefore, the total exposure period for construction activities given the schedule identified in Section 3.3.4 would be approximately 3% of the total exposure period used for typical residential health risk calculations (i.e., 30 years). As described above, the nearest receptors are located approximately 3,380 feet east of the project site. On-road truck travel associated with the soil management activities would also generate diesel PM. As described above, several residences are located at varying distances (generally 75 feet or more) from the proposed haul route along Monument Road. However, these emissions would not result in a continuous emissions source or plume from the haul route. In addition, the quantity of haul truck trips would vary by disposal option/possible beneficial reuse based on the content of sand in the excavated materials. For example, material with high sand content would have the option of beneficial reuse for beach nourishment; and thus would not be exported off-site along the haul route. As such, construction activities would not occur in the immediate proximity of sensitive receptors for an extended period of time. Further, concentrations of mobile source diesel PM emissions are typically reduced by 70% at a distance of approximately 500 feet from freeways, which are continuous emission sources (CARB 2005). Studies also indicate that diesel PM emissions and the relative health risk can decrease substantially within 300 feet (CARB 2005; Zhu *et al.* 2002). In addition, emissions associated with the restoration and

enhancement activities would occur at distances farther than 3,380 feet as construction activities move across the 101-acre TETRP II Phase I project site.

CARB has also adopted Airborne Toxic Control Measures (ATCMs) to reduce air emissions from mobile sources. CARB has adopted an ATCM that limits diesel-fueled commercial motor vehicles idling. The rule applies to motor vehicles with gross vehicular weight ratings greater than 10,000 pounds that are licensed for on-road use and restricts vehicles from idling for more than 5 minutes at any location with exceptions for idling that may be necessary in the operation of the vehicle. In addition, CCR Title 13, Article 4.8, Chapter 9, Section 2449 regulates emissions from off-road diesel equipment in California. This regulation limits idling of equipment to no more than 5 minutes, and requires equipment operators to label each piece of equipment and provide annual reports to CARB of their fleet's usage and emissions. Therefore, given the substantial and varying buffer distance to the nearest sensitive receptors and highly dispersive nature of diesel PM emissions, construction of Alternative 1 elements would not expose sensitive receptors to substantial pollutant concentrations. **This impact would be less than significant pursuant to CEQA (CEQA Criterion C).**

Areas of vehicle congestion have the potential to create pockets of CO called hotspots. These pockets have the potential to exceed the state 1-hour standard of 20 parts per million (ppm) or the 8-hour standard of 9.0 ppm. However, with the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the SDAB and in the state have steadily declined. CO concentrations have not exceeded the NAAQS and CAAQS in the last 20 years (SDAPCD 2021). Nonetheless, this analysis evaluates Alternative 1's potential to result in CO hotspots. CO concentration is a direct function of motor vehicle activity, particularly during peak commute hours, and certain meteorological conditions. Under specific meteorological conditions, CO concentrations may reach unhealthy levels with respect to local sensitive land uses, such as residential areas, schools, preschools, playgrounds, and hospitals. As a result, air districts typically recommend analysis of CO emissions at a local rather than a regional level. Many air districts have established preliminary screening criteria to determine if mobile-source emissions of CO would result in, or substantially contribute to, emissions concentrations that exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9.0 ppm, respectively. SDAPCD has not established screening criteria for CO hotspots, but the County of San Diego indicates that projects that cause road intersections to operate at or below LOS E with intersection peak-hour traffic volumes exceeding 3,000 vehicles could create a CO hotspot and result in a cumulatively considerable net increase of CO (County of San Diego 2007). As described in more detail in Section 4.12, Transportation, soil management activities would involve a maximum of 508 haul truck trips per day. Monument Road/Beach Trail provides beach access for pedestrians and equestrians, as well as emergency access, and thus do not experience traffic volumes close to the screening level of 3,000 vehicles during peak hour traffic. Therefore, it is not anticipated that implementation of Alternative 1 would cause a CO hotspot. Specifically,

the CO concentrations resulting from Alternative 1 would not violate the CAAQS for the 1-hour period (20 ppm) or the 8-hour period (9.0 ppm). **Therefore, this impact would be less than significant under CEQA (CEQA Criterion C).**

Project construction emissions would also result in other emissions, such as those leading to odors. The human response to emissions that lead to odors is extremely subjective, and sensitivity to odors varies greatly among the public. The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. While offensive odors rarely cause physical harm, they can be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies. Potential sources that may emit odors during construction activities include exhaust from diesel construction equipment. However, because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, nearby receptors would not be affected by diesel exhaust odors associated with project construction. Odors from these sources would be localized and generally confined to the immediate area surrounding the project site. In addition, odors would be temporary and limited to the duration of the proposed construction activities. Further, as described previously, the distance to the nearest sensitive receptors would vary as construction activities move across the 101-acre project site. Vegetation clearing and dredging could also result in odors associated with a high level of organic debris. However, while an odor may be noted, it would be typical of odor currently associated with low tide conditions in the area. Therefore, Alternative 1 would not result in other emissions, such as those leading to objectionable odors affecting a substantial number of people. **Impacts associated with odors would be less than significant under CEQA (CEQA Criterion D) and would not be significant pursuant to NEPA.**

Proposed Project

The proposed project is similar to Alternative 1; however, the proposed project involves lower material excavation and subsequent off-site export; thus, discussions and conclusions identified under Alternative 1 are also applicable to the proposed project. **Therefore, the proposed project would not conflict with or obstruct implementation of the applicable air quality plan (CEQA Criterion A). The proposed project would result in a potentially significant impact of PM_{10} and $PM_{2.5}$ emissions pursuant to CEQA (CEQA Criterion B). The proposed project would also not result in emissions that exceed the de minimis levels; therefore, no significant air quality direct or indirect effects would occur pursuant to NEPA. Similar to Alternative 1, the proposed project would not expose sensitive receptors to substantial pollutant concentrations of criteria air pollutants, TAC emissions, or CO hotspots (CEQA Criterion C) and the proposed project would also not result in other emissions such as those leading to odors (CEQA Criterion D). Therefore, potentially significant air quality impacts have been**

identified for PM_{10} and $PM_{2.5}$ emissions pursuant to CEQA (CEQA Criterion B); however, no significant air quality effects have been identified pursuant to NEPA.

No Project/No Action Alternative

The No Project/No Action Alternative would not result in construction equipment usage, material excavation and placement, or construction-related vehicle trips. **The No Project/No Action Alternative would not result in emissions and would not impact the air quality in the region; therefore, no significant impacts pursuant to CEQA (CEQA Criteria A through D) or NEPA would occur.**

4.13.4 Avoidance, Minimization, and Mitigation Measures

Under NEPA, estimated emissions associated with the alternatives are less than the General Conformity de minimis levels. No significant direct or indirect effects have been identified, so the measures below are considered avoidance and/or minimization measures under NEPA.

Under CEQA, construction-related emissions would exceed the recommended level of significance for PM_{10} emissions, and construction activities could lead to a violation of an applicable air quality standard (CEQA Criterion B). To reduce construction-related criteria pollutant emissions, Alternative 1 shall implement the following mitigation measure for the duration of the construction period:

AQ-1: The following measures shall be implemented by the construction contractor to reduce fugitive dust emissions associated with off-road equipment and heavy-duty vehicles:

- Water the grading areas twice daily, or as necessary, to minimize fugitive dust;
- Stabilize graded areas as quickly as possible to minimize fugitive dust;
- Stabilize or pave the last 100 feet of internal travel path within the construction site prior to public road entry;
- Remove visible track-out into traveled public streets;
- Wet wash the construction access point at the end of each workday if vehicle travel on unpaved surfaces has occurred, as necessary;
- Water exposed surfaces (e.g., unpaved access roads) twice per day, or as necessary, to control fugitive dust;
- Provide sufficient perimeter erosion control to prevent washout of silty material onto public roads;
- Cover haul trucks to minimize blow-off during hauling;
- Suspend soil disturbance and travel on unpaved surfaces if winds exceed 25 mph;
- Cover/water on-site stockpiles of excavated material;

- Enforce a 15 mile-per-hour speed limit on unpaved surfaces;
- Sweep dirt and debris spilled onto paved surfaces on dry days to reduce re-suspension of particulate matter caused by vehicle movement. Clean approach routes to construction sites of construction-related dirt in dry weather; and
- Hydroseed, landscape or develop disturbed areas as quickly as possible to reduce dust generation.

Table 4.13-7 shows the daily and annual construction emissions for the proposed project with implementation of Mitigation Measure AQ-1.

Table 4.13-7
Alternative 1 – Mitigated Maximum Daily and Annual Construction-Related Emissions

Description	VOC	NOX	CO	SOX	PM10	PM2.5
Maximum Daily Emissions (Restoration/ Enhancement and Soil Management) (lbs./day)	17.55	238.66	100.79	0.42	105.99	25.39
Daily Threshold (lbs./day)	75	250	550	250	100	55
Exceeds Threshold?	No	No	No	No	Yes	No
Total Construction-Related Emissions (Restoration/ Enhancement and Soil Management) (tons/year)	1.69	22.76	9.90	0.04	10.10	2.41
Annual Threshold (tons/year)	13.7	40	100	40	15	10
Exceeds Threshold?	No	No	No	No	No	No

Notes: VOC = volatile organic compounds; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less, $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; lbs./day = pounds per day

Implementation of Mitigation Measures AQ-1 would reduce fugitive dust emission estimates associated with the enhancement/restoration and soil management activities. As shown in Table 4.13-7, $PM_{2.5}$ emissions would be mitigated below the thresholds of significance. However, daily PM_{10} emissions would continue to exceed the daily threshold of significance under CEQA. As described previously, fugitive dust emissions are primarily associated with site preparation and grading activities and vary as a function of such parameters as soil silt content, soil moisture, wind speed and VMT. On a day-to-day basis, fugitive dust emissions would vary based on weather, site conditions, and specific area of construction. While Mitigation Measure AQ-1 would substantially reduce PM_{10} emissions (an approximate 72%reduction in fugitive PM_{10} emissions), PM_{10} emissions would continue to exceed the threshold of significance. Therefore, fugitive dust emissions of PM_{10}

could continue to lead to a violation of an applicable air quality standard. **This impact would remain significant and unavoidable under CEQA (CEQA Criterion B).**

The estimated annual emissions for the project alternatives would not exceed the NEPA de minimis levels. Therefore, no significant direct or indirect air quality effects would occur pursuant to NEPA.

4.14 GREENHOUSE GAS EMISSIONS

This section assesses the greenhouse gas (GHG) emissions and impacts associated with implementation of the project. GHG emissions have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to global climate change. This section is based largely on the Greenhouse Gas Technical Memorandum prepared for the project (AECOM 2021c).

4.14.1 Affected Environment

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters the earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back towards space. This infrared radiation (i.e., thermal heat) is absorbed by GHGs within the earth's atmosphere. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on the earth.

GHGs are present in the atmosphere naturally, are released by natural and anthropogenic sources, and are formed from secondary reactions taking place in the atmosphere. Natural sources of GHGs include the respiration of humans, animals and plants, decomposition of organic matter, and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels, waste treatment, and agricultural processes. The following are GHGs that are widely accepted as the principal contributors to human-induced global climate change:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)

Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4 is the main component of natural gas and is associated with agricultural practices and landfills. N_2O is a colorless GHG that results from industrial processes, vehicle emissions, and agricultural practices. HFCs are synthetic chemicals used as a substitute for chlorofluorocarbons in automobile air conditioners and refrigerants. PFCs are produced as a byproduct of various industrial processes associated with aluminum production and the manufacturing of semiconductors. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable GHG used for insulation in electric power transmission and distribution equipment, and in semiconductor manufacturing. The project would primarily generate emissions of CO_2, CH_4, and N_2O.

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO_2. The GWP of a GHG is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time (i.e., lifetime) that the gas remains in the atmosphere ("atmospheric lifetime"). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main GHGs that have been attributed to human activity include CH_4, which has a GWP of 28, and N_2O, which has a GWP of 265 (IPCC 2013). For example, 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 28 tons of CO_2. GHGs with lower emissions rates than CO_2 may still contribute to climate change, because they are more effective at absorbing outgoing infrared radiation than CO_2 (i.e., high GWP). The concept of CO_2-equivalents (CO_2e) is used to account for the different GWP potentials of GHGs to absorb infrared radiation.

Although the exact lifetime of particular GHG molecule is dependent on multiple variables, it is understood by scientists who study atmospheric chemistry that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. GHG emissions related to human activities have been determined as "extremely likely" to be responsible (indicating 95% certainty) for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (CARB 2014). The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, no single project is expected to measurably contribute to a noticeable incremental change in the global average temperature, or to a global, local, or micro climate.

Regulatory Setting

The following laws, regulations, policies, and plans are applicable to this resource area:

- Clean Air Act
- Council on Environmental Quality Guidance
- Mandatory Greenhouse Gas Reporting Rule
- Assembly Bill 1493
- EO S-3-05
- Assembly Bill 32: California Global Warming Solutions Act of 2006
- Senate Bill 97
- EO S-13-08
- Senate Bill 32
- CARB Climate Change Scoping Plans
- EO S-1-07
- EO B-30-15
- Senate Bill 350

GHG Inventories

National

In 2019, U.S. GHG emissions totaled 6,558 million metric tons (MMT) of CO_2e (EPA 2021b). The major source of GHG emissions is the transportation sector, accounting for 29% of the total emissions. The electricity sector is the second largest source of emissions, accounting for approximately 25% of the total emissions. The electricity sector is followed by the industry sector, which accounts for 23% of the total GHG emissions (EPA 2021b).

California

In 2019, emissions from GHG emitting activities statewide were 418 MMT of CO_2e (CARB 2021). The major source of GHG in California is transportation, contributing approximately 40% of the state's total GHG emissions. The next largest source of GHG emissions in California is the industrial sector, contributing approximately 21% of the state's total GHG emissions. The industrial sector is followed by the electricity sector, which accounts for 14% of the state's total GHG emissions (in-state generation and imports) (CARB 2021).

4.14.2 CEQA Thresholds of Significance

Would the project:

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?

CEQA Impact Analysis

As stated in the CEQA Guidelines, these questions are "intended to encourage thoughtful assessment of impacts and do not necessarily represent thresholds of significance" (Title 14, Division 6, Chapter 3 Guidelines for Implementation of the CEQA, Appendix G, VII Greenhouse Gas Emissions). The CEQA Guidelines encourage, but do not require lead agencies to adopt thresholds of significance (CEQA Guidelines, § 15064.7). The Guidelines allow lead agencies to develop their own significance threshold and/or to consider thresholds of significance adopted or recommended by other public agencies, or recommended by experts, provided that the thresholds are supported by substantial evidence. Individual lead agencies may also undertake a case-by-case approach for the use of significance thresholds for projects consistent with available guidance and current CEQA practice (OPR 2018).

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, a single project would be unlikely to measurably contribute to a noticeable incremental change in the global average temperature. GHG impacts to global climate change are inherently cumulative, and projects should be evaluated through cumulative impacts because GHG emissions from multiple projects could result in a cumulative impact with respect to global climate change.

The SDAPCD has not adopted a GHG threshold to analyze projects under CEQA. Therefore, in order to establish additional context in which to consider the proposed project's GHG emissions, this analysis reviewed guidelines used by other public agencies and the County of San Diego guidelines. The proposed project's GHG emissions are primarily related to construction activities associated with the temporary enhancement/restoration and soil management activities; however, the County of San Diego has not adopted thresholds for evaluating GHG emissions from construction activities (the County of San Diego is currently in the process of updated its Climate Action Plan for proposed land use development projects). Nevertheless, within the County of San Diego Report Format and Content Requirements for Climate Change, the County of San Diego recommends that GHG emissions that would occur during construction are quantified. Other districts, including the SCAQMD, have recommended that GHG emissions from construction and short-term sources be amortized over the lifetime of the project (typically assumed to be 30 years) for comparison with significance thresholds (SCAQMD 2008). The draft thresholds released by the SCAQMD include possible thresholds of 3,000 metric tons carbon dioxide equivalent (MT CO_2e) per year for all non-industrial projects (residential, commercial, and mixed-use projects). The most conservative threshold was included in the California Air Pollution Control Officers Association (CAPCOA) report, CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act, which recommends a threshold of 900 MT CO_2e per year for any residential, commercial, or industrial project (CAPCOA 2008). The proposed project is not a typical land use development project and after restoration and soil management activities are completed, the project would not involve operational emissions. Thus, this analysis also reviewed guidelines used by other public agencies. For example, SMAQMD has identified an annual threshold of 1,100 MT CO_2e per year for the construction phase of all project types. SMAQMD recognizes that, although there is no known level of emissions that determines whether a single project would substantially impact overall GHG emission levels in the atmosphere, a threshold must be set to trigger a review and assessment of the need to mitigate project GHG emissions (SMAQMD 2021). The threshold set by SMAQMD was developed to allow lead agencies to assess the consistency of proposed projects with AB 32 and Senate Bill 32 reduction goals.

These significance thresholds were developed to assess consistency of a project's emissions with the statewide framework for reducing GHG emissions. However, it is not the intent of CSP to adopt the above thresholds as mass emissions limits for this or other projects, but rather to provide this additional information to put the project generated GHG emissions in the appropriate statewide context.

Climate Change and Sea Level Rise

Since GHG emissions are a primary factor in climate change and the resulting effects, these topics are evaluated together. Section 15126.2 of the CEQA Guidelines states that "the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas." In March 2012, the California State Coastal Conservancy (SCC) issued a guidance document for projects funded by the SCC for assessing impacts and vulnerabilities of a project subject to sea level rise and extreme events. The SCC recommends a risk analysis approach to evaluate the ability of a project to adapt or cope with sea level rise over time, including implementation of project design features that would reduce risks. In August 2015, the CCC also adopted their Sea-Level Rise Policy Guidance to provide a framework for addressing sea-level rise in local coastal programs and Coastal Development Permits (CCC 2015). The Sea-Level Rise Policy Guidance emphasizes the use of soft solutions such as beach replenishment as a component of shoreline protection and recommends habitat restoration and enhancement projects be designed to withstand impacts of sea level rise and adapt to future conditions. On November 7, 2018, the CCC adopted the Science Update to the Seal Level Rise Policy Guidance to include science-focused updates and provide recommendations for how to plan for and address sea level rise impacts (CCC 2018).

Climate change is expected to result in a suite of additional potential changes that could affect the natural environment in a manner that is relevant to the proposed project. The potential effect of climate change on the project and the benefits of the project to address and mitigate the impacts of climate change is discussed qualitatively.

NEPA Impact Analysis

In June 2019, the Council on Environmental Quality (CEQ) published Draft NEPA Guidance on Consideration of GHG Emissions. However, on January 20, 2021, President Biden issued EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis* to establish among other things an Administration policy to listen to the science; improve public health and protect our environment; ensure access to clean air and water; limit exposure to dangerous chemicals and pesticides; hold polluters accountable, including those who disproportionately harm communities of color and low-income communities; reduce GHG emissions; and bolster resilience to the impacts of climate change. Additionally, on January 27, 2021, President Biden signed EO 14008, *Tackling the Climate Crisis at Home and Abroad,* to in part establish a government-wide approach to the climate crisis by reducing GHG emissions and to ensure that federal permitting decisions consider the effects of GHG emissions and climate change. On February 19, 2021, CEQ rescinded the 2019 Draft GHG Guidance and is reviewing, for revision and update, the 2016 Final Guidance pursuant to EO 13990. The CEQ has not issued its

review of and any appropriate revisions and updates to the 2016 GHG Guidance yet. In the interim, the CEQ advises that agencies should consider all available tools and resources in assessing GHG emissions and climate change effects of their proposed actions, including, as appropriate and relevant, the 2016 GHG Guidance. There are currently no federally mandated thresholds for the significance evaluation of GHG emissions under NEPA. Independent of NEPA, but pursuant to 40 CFR § 98 (the Mandatory Reporting of Greenhouse Gases Rule), EPA requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 MT CO_2e emissions per year (EPA 2013). Consistent with this requirement, this analysis compares the estimated GHG emissions for the proposed project to the EPA mandatory reporting threshold of 25,000 MT CO_2e per year to determine whether the GHG emissions could contribute significantly to global climate change.

Consistent with Section 4.13, Air Quality, this analysis evaluates enhancement/restoration and soil management activities together. Climate change and GHG emissions are a cumulative impact and therefore emissions associated with individual project components must be evaluated together. In addition, because the potential effects of GHG emissions are inherently a global cumulative effect, this analysis of project-specific emissions satisfies the requirement under both NEPA and CEQA that agencies analyze the cumulative effects of a proposed action. Therefore, a separate cumulative effects analysis is not required.

4.14.3 Environmental Evaluation

The 1991 TETRP EIR/EIS did not evaluate potential GHG impacts. Therefore, TETRP II Phase I currently under evaluation in this tiered document will not rely on previous analysis, significance conclusions, or mitigation measures.

This analysis focuses on the GHG emissions resulting from construction of the proposed project and alternatives. GHG emissions were estimated consistent with the methodology described in Section 4.13.3 and total estimated duration of the construction activities.

4.14.3.1 Restoration/Enhancement and Soil Management

Alternative 1

Construction-related GHG exhaust emissions associated with the restoration/enhancement and soil management activities would be generated by heavy-duty diesel off-road (e.g., construction equipment) and on-road equipment (haul trucks and worker commutes). As shown in Table 4.14-1, construction activities would generate an estimated total of 4,027 MT CO_2e. When amortized over the typical project lifetime (30 years), this equates to 134 MT CO_2e per year. However, it should be noted that Alternative 1 intends to mitigate climate change impacts and consistent with guidance set forth by the State Coastal Conservancy (State Coastal Conservancy 2012), sea level rise horizon years

are 2065 and 2100. Therefore, amortizing the construction-related GHG emissions over 30 years is a conservative approach.

Table 4.14-1
Alternative 1 – Total and Amortized Construction-Related GHG Emissions

Description/Source	MT CO_2E
Mobilization	30
Construction Window 1	2,059
Remobilization	30
Construction Window 2	1,849
Demobilization	58
Total Emissions	4,027
Amortized GHG Emissions (MT CO_2e per year)	**134**

Notes: Totals may not add due to rounding.
MT CO_2e = metric tons carbon dioxide equivalent

Therefore, the GHG emissions associated with the restoration and soil management activities would not exceed the thresholds discussed above, including the most conservative annual threshold of 900 MT CO_2e. **Therefore, this impact would not be a considerable contribution to the cumulative climate change impact and this impact would be less than cumulatively considerable pursuant to CEQA (CEQA Criterion A).** Further, Alternative 1's GHG emissions do not exceed the EPA mandatory reporting threshold of 25,000 MT CO_2e per year. **Therefore, consistent with this comparison, Alternative 1 construction would not result in a significant effect related to GHG emissions under NEPA.**

Measures in the CARB Scoping Plan update would indirectly address GHG emissions from construction activities, including the phasing in of cleaner technology for diesel engine fleets (including construction equipment and medium-duty and heavy-duty vehicles) and the development of a low-carbon fuel standard. However, successful implementation of these measures predominantly depends on the development of laws and policies at the state level. As such, none of these statewide plans or policies constitutes a regulation to adopt or implement a regional or local plan for reduction or mitigation of GHG emissions. Thus, it is assumed that requirements or policies formulated under the mandate of AB 32 and Senate Bill 32 that would be applicable to Alternative 1, either directly or indirectly, would be implemented consistent with statewide policies and laws. In addition, as described in Table 3-8, Alternative 1 would implement project design features to minimize energy use during construction, which also reduces GHG emissions, such as limiting idling of heavy equipment and requiring contractors to maintain and tune engines per manufacturer's specifications (PDF-5). Alternative 1 construction would also reduce landfill waste to the extent possible, such as identifying possible beneficial reuse/disposal options, based on the content of sand in the excavated materials.

In addition, restoring tidal salt marshes in North America is "one of the most effective measures for sequestering carbon" (Trulio *et al.* 2007). This is due mostly to their ability to "sequester carbon at a rate about 10-fold higher on an area basis than other wetland ecosystems due to high sedimentation rates, high soils carbon content, and constant burial due to sea level rise" (Brigham *et al.* 2006). Salt marsh is also highly effective in trapping CH_4 due to high salinity rates that abate the release of this GHG. Brackish and freshwater marsh have lower salinities and are not as effective with regard to capturing GHGs. Therefore, recovering salt marsh even at the expense of brackish and freshwater marsh provides far greater value with regard to abating climate change through the sequestering of GHGs. Thus, the restoration efforts within the estuary would help to offset some of the GHG emissions generated by project implementation as well as continue to sequester carbon into the future at a higher rate than current conditions.

Although Alternative 1 construction would result in GHG emissions, Alternative 1 would seek to establish and restore wetland habitats in order to increase the resilience of the Tijuana River Valley against potential climate change impacts, which is consistent with overall goals in CARB's Scoping Plan update to mitigate climate change impacts and support wildlife habitat in natural and working lands. CARB's Scoping Plan update includes a strategy to restore coastal and sub-tidal areas in efforts to reduce impacts to sensitive species and habitats. Therefore, Alternative 1's activities associated with enhancement/restoration and soil management would not conflict with the CARB Scoping Plan update, and **this impact would be less than cumulatively significant pursuant to CEQA (CEQA Criterion B) and NEPA.**

Climate Change and Sea Level Rise

In addition to global warming, climate change is expected to result in a suite of additional potential changes that could affect the natural environment, including water resource availability and impacts on biological resources. Climate change is anticipated to affect the frequency and intensity of extreme weather events, including causing large storm events and more severe droughts in western watersheds. Beach placement (i.e., Options 3 through 5) as proposed would be consistent with recommendations outlined in the Sea-Level Rise Policy Guidance that includes an emphasis on soft solutions as a component to shoreline protection. As discussed in more detail in Chapter 3.0, Alternatives, Alternative 1's restoration designs are based on the consideration of potential climate change impacts for the estuary and its restoration, as informed by the CURRV project (TRNERR 2014). These climate-related studies included consideration of long-term change in the Tijuana River Valley, interpretation of sea level rise modeling results, expert elicitation, and scenario planning under varying sea level rise scenarios (Safran *et al*. 2017; Gersberg 2009; Thorne *et al*. 2016; Goodrich *et al*. 2018). The CURRV process indicated that there are broad areas of transitional habitat within the Tijuana River Valley that eventually could convert to tidal wetland with sea level rise. Additionally, elevation increases due to sedimentation within the estuary have been so extensive in critical locations, including within the project site, that it would take decades to recover lost habitats. More

fundamentally, empirical evidence from observations during El Niño conditions and scenario planning exercises suggest that elevated sea levels coupled with changing wave climates can increase the frequency and/or duration of mouth closure events, thus decreasing the resilience of the system and dramatically compromising ecosystem integrity and health (Harvey *et al*. 2020).

Alternative 1 would implement restoration within Tijuana Estuary that would address ongoing degradation of coastal resources that provide essential habitat for listed species, migratory birds, fish, and other aquatic resources. Restoration that increases the tidal prism would also improve water and habitat quality and increase tidal channel, mudflat, and salt marsh habitat needed to support healthy fish and wildlife populations. Adaptation measures can be implemented to minimize risks from sea-level rise and protect coastal resources. Since Alternative 1's restoration design is based on the consideration of potential climate change impacts including sea level rise, this is consistent with the CCC's goal to incorporate sea level rise in restoration, creation, or enhancement of coastal habitats (Goal C.8). Therefore, Alternative 1 would be consistent with the adaptation strategies included within the CCC's Sea Level Rise Policy Guidance. Overall, Alternative 1 would improve the ability of the project area to respond to long-term climate impacts, such as increased sea level rise.

Proposed Project

The proposed project is similar to Alternative 1; however, the proposed project involves lower material excavation and subsequent off-site export; thus, discussions and conclusions identified under Alternative 1 are also applicable to the proposed project. **Therefore, the proposed project would not result in a considerable contribution to the cumulative climate change impact and this impact would be less than cumulatively considerable pursuant to CEQA (CEQA Criterion A). Construction of the proposed project would also not result in a significant effect related to GHG emissions under NEPA.** The proposed project would also improve the ability of the project area to respond to long-term climate impacts, such as increased sea level rise. In addition, soil management Options 3 through 5 provide soft solutions through beach nourishment consistent with Sea-Level Rise Policy Guidance by including soft solutions as a component to shoreline protection.

No Project/No Action Alternative

Under the No Project/No Action Alternative, the proposed TETRP II Phase I restoration of the estuary would not be completed. No removal of soil or vegetation would occur to restore or establish habitat or channel improvements and therefore, would not generate the associated GHG emissions. **Thus, implementation of the No Project/No Action Alternative would not result in a considerable contribution to the cumulative climate change impact and this impact would be less than cumulatively considerable under CEQA (CEQA Criterion A). The No Project/No Action Alternative would not conflict with an applicable plan, policy or**

regulation adopted for the purpose of reducing the emissions of GHGs (CEQA Criterion B). No significant impacts pursuant to NEPA have been identified. However, under the No Project/No Action Alternative, the benefits of increasing the tidal prism would not be realized relative to providing increased resiliency to the long-term effects of climate change, such as sea level rise. The estuary would continue to be affected by periodic coastal wave action that may result in erosion or overtopping of the barrier beach that shields the wetlands from continuous wave action and impacts from sea level rise; thus decreasing the resilience of the system and dramatically compromising ecosystem integrity and health.

4.14.4 Avoidance, Minimization, and Mitigation Measures

The proposed project would not result in impacts to GHG emissions that are cumulatively significant under CEQA or NEPA; therefore, no mitigation measures are required.

4.15 NOISE

This section addresses the potential noise impacts associated with the proposed project, specifically the potential for the project to expose people to noise levels that exceed applicable noise standards or cause a substantial temporary increase in ambient noise levels at noise-sensitive land uses during project construction and/or maintenance. Since the proposed project is a restoration project and would not result in notable operational noise, this analysis focuses on assessing noise impacts related to short-term construction and infrequent maintenance. Once the project is constructed and vegetation is established, site activities would be limited to intermittent activities. The analysis is largely based on the Noise Technical Memorandum prepared for the project (AECOM 2021d). Noise impacts related to protected animal species and their habitats are discussed in Section 4.6, Biological Resources.

4.15.1 Affected Environment

Regulatory Setting

The following laws, regulations, policies, and plans are applicable to this resource area:

- City of San Diego General Plan, Noise Element
- City of San Diego Municipal Code, Noise Ordinance
- City of Imperial Beach Municipal Code, Noise Ordinance
- Federal Transportation Administration (FTA) Transit Noise and Vibration Impact Assessment Manual

Noise

Sound is a physical phenomenon generated by vibrations that result in waves that travel through a medium, such as air, and result in auditory perception by the human brain. Noise is typically defined as unwanted or disruptive sound. Whether something is perceived as a noise event is influenced by the type of sound, the perceived importance of the sound, and its appropriateness in the setting, the time of day, and the type of activity during which the noise occurs and the sensitivity of the listener. In its most basic form, a continuous sound can be described by its spectrum of frequency content (pitch) and its amplitude (loudness).

Frequency is defined in hertz (Hz), which is a measure of how many times each second the front of a sound pressure wave passes a fixed point. For example, if a bell vibrates 500 times per second, it generates a sound pressure wave that is oscillating at 500 Hz, and this pressure oscillation is perceived by the ear/brain as a tonal pitch of 500 Hz. Sound frequencies between 20 and 20,000 Hz are within the range of sensitivity for a young, healthy human ear.

Amplitude is defined in decibels (dB), using a logarithmic scale. A sound level of zero dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal conversational speech has a sound level of approximately 60 dB. Sound levels above approximately 110 dB begin to be felt inside the human ear as discomfort and eventually pain at 120 dB and higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 1 to 2 dB, typically in a laboratory setting. In a normal outdoor acoustic setting, a change by 3 dB would be barely perceived and a change of 5 dB would be readily perceived. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or if decreasing by 10 dB, halving) of the sound's loudness (Caltrans 2013).

The "A-weighted" noise scale is used for measurements and standards involving the human perception of noise and is written as dB(A) or dBA. This scale applies additive and subtractive adjustments to frequency bands to reflect the typical frequency-dependent sensitivity of the average healthy human ear.

Environmental sound levels vary continuously and include a mixture of sound from near and distant sources. A single descriptor, L_{eq}, may be used to describe such sound that is changing in level from one moment to another. L_{eq} is the energy-average sound level during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a single, steady source to equal the acoustic energy contained in the fluctuating sound level measured over a specified period of time. Though not wholly accurate, it's often used to relay an "average" noise level across a specified period.

The CNEL is commonly used to evaluate noise impacts from transportation noise sources. The descriptor was developed to account for the increased sensitivity to nighttime noise. CNEL represents the 24-hour sound level based on the measured or predicted L_{eq} values across a 24-hour period. Between the hours of 7:00 p.m. and 10:00 p.m., L_{eq} values are penalized (increased) by 5 dB, and between 10:00 p.m. to 7:00 a.m. L_{eq} values are increased by 10 dB.

Noise-sensitive receptors are generally considered places where humans are engaged in activities where noise may generate notable annoyance or disruption in activities. Activities usually associated with sensitive receptors include, but are not limited to, sleeping, studying or learning, and convalescence. Land uses often associated with sensitive receptors include residential dwellings, hotels and motels, hospitals, nursing residences, educational facilities, and libraries.

The proposed project site is surrounded by passive recreation (e.g., hiking trails) and by a campground and residential development to the east. The nearest noise-sensitive receptors to proposed project construction activities are the Tijuana River Valley Regional Park Campground campsites and the single-family residential homes at 1950 Monument Road, approximately 3,380 feet and 7,300 feet

east of the approximate center of the nearest construction area, respectively. Both project haul route options are adjacent to single-family residential structures. Some of these noise-sensitive land uses are as close as 30 feet from the centerline of Monument Road and Hollister Street.

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. Ground-borne vibration propagates from the source through the ground to adjacent buildings by surface waves which dissipate geometrically as sound travels through the ground, causing the vibration amplitude to decrease with distance away from the source. Soil properties affect the propagation of vibration, with stiffer soils, clays, and rock strata enabling more efficient transmission of vibrational energy.

Vibration in buildings typically is perceived as the rattling of windows or items on shelves, or the motion of building surfaces. At sufficiently high levels and depending on the loudness of the background airborne noise level, the vibration of interior building surfaces can be heard as a low-frequency rumbling sound, also known as ground-borne noise.

The peak particle velocity (PPV) is normally described in inches per second (in/s). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is the metric often used to describe blasting vibration and other vibration sources that may result in structural stresses in buildings. Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response to ground vibrations. The human body takes some time to respond to vibration signals; therefore, average vibration amplitude (i.e., the root mean square [RMS] velocity) is the most appropriate descriptor for gauging human response to the typical ground vibration. The RMS of a signal is the square root of the average of the squared amplitude of the signal, typically calculated over 1 second. As with airborne sound, the RMS velocity often is expressed in dB notation as vibration dB (VdB), which serves to compress the range of numbers required to describe vibration. This VdB scale is based on a reference value of 1 micro-inch per second. The background vibration-velocity level typical of residential areas is approximately 50 VdB (FTA 2018).

According to FTA guidance (FTA 2018), ground-borne vibration normally is perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels.

Vibration-sensitive receptors are generally considered structures with sensitivity to structural damage from vibratory energy and places where humans are engaged in activities in which vibration may generate notable annoyance or disruption in vibration-sensitive activities.

Existing Noise Environment

The existing noise environment in the vicinity of the project site is primarily influenced by transportation sources surrounding TRNERR. Such transportation sources include distant vehicular traffic from I-5 to the east, intermittent vehicular traffic on Hollister Street and other local roadways, and aviation traffic associated with the NOLF IB to the north. NOLF IB and its surrounding airspace is heavily used for helicopter pilot training exercises, which can be regularly heard throughout TRNERR most days. The noise environment of the beach placement locations is dominated primarily by waves crashing on the shoreline.

4.15.2 CEQA Thresholds of Significance

For the noise analysis, both Appendix G and City of San Diego Thresholds were used as the studied noise-sensitive properties are within the City of San Diego boundary.

Would the project:

a) Result or create a significant increase in the existing ambient noise levels;

b) Expose people to noise levels which exceed the City's adopted noise ordinance or are incompatible with Table K-4;

c) Expose people to current or future transportation noise levels which exceed standards established in the Transportation Element of the General Plan or an adopted airport Comprehensive Land Use Plan;

d) Result in land uses which are not compatible with aircraft noise levels as defined by an adopted airport Comprehensive Land Use Plan (CLUP); or

e) Generate excessive groundborne vibration or groundborne noise levels?

4.15.3 Environmental Evaluation

The 1991 TETRP EIR/EIS did not evaluate potential noise impacts other than specific to biological resources. As noted above, that discussion is included in Section 4.6, Biological Resources. Therefore, TETRP II Phase I currently under evaluation in this tiered document will not rely on previous analysis, significance conclusions, or mitigation measures.

4.15.3.1 Restoration/Enhancement

Alternative 1

On-Site Construction Noise

Noise-sensitive land uses in the vicinity of the project and associated site access roads are within the Cities of San Diego and Imperial Beach. The City of San Diego's Noise Ordinance limits construction hours to 7:00 a.m. to 7:00 p.m. Monday through Saturday and prohibits noise-generating construction activities outside of these periods and on legal holidays. Construction noise level limits shall not exceed an average sound level greater than 75 dB during the 12-hour period at or beyond property zoned residential (City of San Diego 2019). The City of Imperial Beach's Noise Ordinance limits noise disturbances to persons residing or working in the vicinity of construction activities, or in excess of 75 dB, between the hours of 10:00 p.m. and 7:00 a.m. As stated in Section 3.3.4, it is anticipated construction would primarily take place Monday through Friday from 8 a.m. to 6 p.m., and would be in-compliance with local construction noise ordinances.

Project-generated construction noise would vary depending on activity, duration, and the type and usage of equipment. PDF-7 requires that construction equipment be equipped with properly operating and maintained mufflers to minimize noise generation. Construction equipment can be stationary (i.e., operating in one location, such as pumps and generators) or mobile (i.e., moving about the construction site, such as excavators, bulldozers, graders, loaders, and trucks). Heavy construction equipment (e.g., for earth-moving activities) typically operate for short periods at full power followed by extended periods of operation at lower power, idling, or powered-off conditions. Construction noise from restoration and enhancement would be approximately 78 dBA at 50 feet; however, the levels of construction noise at the nearest noise-sensitive use approximately 3,380 feet away would attenuate over this distance to approximately 44 dBA. Given the relative distance to the nearest noise-sensitive uses, temporary construction noise is anticipated to be approximately 30 dBA below both the City of San Diego and City of Imperial Beach's construction noise threshold of 75 dB at the nearest noise-sensitive use (AECOM 2021d).

Under Alternative 1, proposed dredging would likely occur during allowable daytime construction hours. However, nighttime operation of the dredge, outside of allowable daytime construction hours, may occasionally occur. Under Alternative 1, 24-hour operations could occur as well as dredging on Sundays/holidays. Dredging activities would occur along the western portion of the project site, approximately 1 mile away from the nearest noise-sensitive receptors (campground). While dredging activities would be approximately 79 dBA at 50 feet, at the distance of the nearest noise-sensitive use noise generated by dredging activities would be expected to attenuate over this distance to approximately 38 dBA. A predicted noise level of 38 dBA is below the City of San Diego's most stringent nighttime noise standards (i.e., 40 dBA for single-family residential land use) and would not

qualify for time and day construction restrictions because the level would not be considered disturbing, excessive, or offensive at nearest noise-sensitive receptors. Additionally, PDF-8 requires that exposed engines on dredging equipment be housed to the extent feasible to minimize noise. Thus, temporary noise impacts from nighttime dredging would not be considered substantial.

Temporary construction activities resulting from on-site construction activities required by Alternative 1 would not generate a substantial temporary increase in ambient noise levels in the vicinity of the project site and impacts would be less than significant under CEQA (CEQA Criterion A) and no significant impacts would occur pursuant to NEPA.

Off-Site Construction Noise (Vehicle Traffic)

Roadways that would handle the bulk of typical construction traffic (e.g., vehicles of construction personnel and site deliveries) include I-5 and other local roadways such as Monument Road, Hollister Street, Tocayo Avenue, and Dairy Mart Road. The City of San Diego defines the significance threshold for traffic noise as 65 dBA CNEL for single-family detached residences (Table K-2; City of San Diego 2020a). Traffic volumes need to double to achieve a 3 dBA increase, an increase that is barely perceptible (Caltrans 2013). Anticipated off-site construction traffic volumes resulting from employees and equipment traveling to and from the project site would not reach the 65 dBA CNEL threshold and would not result in a substantial temporary increase in ambient noise levels (off-site construction noise associated with soil management, such as haul truck trips from transporting soil off-site, is addressed in Section 4.15.3.2 below). **Thus, temporary off-site construction traffic required by Alternative 1 would not generate a substantial temporary increase in ambient noise levels in the vicinity of the project site and impacts would be less than significant under CEQA (CEQA Criterion A) and a less than significant impact would occur pursuant to NEPA.**

General Plan Consistency/Aviation Noise Exposure

NOLF IB is located approximately 1.5 miles north of the project site and is a federally operated airfield studied in the Air Installations Compatible Use Zones Update for the Naval Air Station North Island and Naval Outlying Landing Field Imperial Beach (Naval Base Command 2011). The restoration area is located wholly outside of the 65 dBA CNEL noise contour for NOLF IB and would not expose project construction workers to excessive aviation noise levels. Alternative 1 proposes to restore native salt marsh habitats within the southern arm of the estuary, and would not result in an altered land use that would expose people to current or future transportation noise levels in exceedance of standards. In addition, Alternative 1 would not result in land uses that are incompatible with aircraft noise levels as defined by the Air Installations Compatible Use Zones Update for NOLF IB. **Thus, a less than significant impact would occur under CEQA (CEQA Criteria C and D) and no significant impacts have been identified pursuant to NEPA.**

Construction Vibration

Vibration-inducing construction equipment used during implementation of Alternative 1 would include dozers and haul trucks. Although construction activities could generate vibrations perceptible to people in the immediate vicinity of project construction sites, vibratory energy dissipates rapidly over short distances. Construction activities would not generate vibration that would be perceptible to sensitive receptors (AECOM 2021d). **Thus, construction activities performed as required by Alternative 1 would be less than significant under CEQA (CEQA Criterion E) and no significant effects would occur pursuant to NEPA.**

Operational Noise and Vibration

There would be no permanent noise or vibration-generating uses associated with Alternative 1. Long-term maintenance activities are not anticipated under Alternative 1, although localized actions may be required to manage and maintain channel and wetland function. The river mouth may require periodic excavation to maintain an open condition. These activities would be short-term, temporary efforts that would be notably less intensive than those described for temporary project construction noise impacts, would generate a negligible amount of noise, and would not be in exceedance of adopted noise ordinances. In addition, Alternative 1 does not propose new land uses that would be incompatible with aircraft noise levels. **Thus, Alternative 1 would not generate a substantial permanent increase in ambient noise levels or vibrations in the vicinity of the project site nor in excess of local standards. Impacts would be less than significant under CEQA (CEQA Criteria A through E) and no significant effects would occur pursuant to NEPA.**

Proposed Project

The proposed project is similar to Alternative 1, and restoration and other enhancement efforts that would occur under the proposed project would not change or alter noise impacts as analyzed for Alternative 1 above; thus, discussions and conclusions identified under Alternative 1 are also applicable to the proposed project. **During restoration and enhancement activities associated with implementation of the proposed project, noise and vibration impacts would be less than significant under CEQA (CEQA Criteria A through E) and NEPA.**

No Project/No Action Alternative

The No Project/No Action Alternative would not result in construction-related vehicle trips, excavation/grading, or dredging activities. **The No Project/No Action Alternative would not impact the noise environment; therefore, no noise impacts pursuant to CEQA (CEQA Criteria A through E) or NEPA would occur.**

4.15.3.2 Soil Management

On-Site Construction Noise

Noise-sensitive receptors (i.e., residences) are not located near the beach nourishment site. Therefore, the primary project noise sources during sand placement from construction equipment as sandy material is moved around the beach, and delivery pipelines are assembled and disassembled, would generally be inaudible at noise-sensitive receptors. Areas of active material placement would be temporarily restricted to the public for safety; thus, limiting the ability of recreationalists to be close to the noise generating equipment. **Thus, temporary construction activities resulting from the on-site construction activities required during beach nourishment would not generate a substantial temporary increase in ambient noise levels nor exceed established thresholds, and impacts would be less than significant under CEQA (CEQA Criterion A) and NEPA.**

Off-Site Construction Noise (Vehicle Traffic)

Truck trips associated with hauling excess soil from the restoration site could affect portions of Monument Road, Hollister Street, Tocayo Avenue, and Dairy Mart Road would handle the bulk of construction traffic for soil transport. Although off-site construction traffic noise from employees traveling to and from the site would be minimal, soil removal and hauling requirements under certain soil management options would result in a large volume of haul trucks traveling from the project site to one or more off-site disposal locations. Rural local roadways, including Monument Road, Dairy Mart Road, Tocayo Avenue, and Hollister Street would experience truck trips associated within hauling material from the project site. Up to 254 round trips would occur each day to haul materials, resulting in up to 508 individual pass-by events each day at noise-sensitive land uses fronting these roadways (Anchor QEA 2021a). The worst-case volume of heavy trucks at the nearest noise-sensitive receptor would generate a 24-hour noise exposure of approximately 61 dBA, CNEL at the nearest noise-sensitive receptor (AECOM 2021d). The haul route traffic would generate traffic noise levels below the land use compatibility standards for acceptable traffic noise exposure at exterior use areas of residential properties of 65 dBA, CNEL as defined in Table K-2 of the City of San Diego's CEQA Significance Determination Thresholds guidance (City of San Diego 2020a). **Thus, temporary impacts from construction haul route noise during soil management would be less than significant under CEQA (CEQA Criterion A) and NEPA.**

General Plan Consistency/Aviation Noise Exposure

The project site is located outside of the 65 dBA CNEL noise contour for NOLF IB and would not expose project construction workers to excessive aviation noise levels. Alternative 1 would not introduce an incompatible land use with aircraft noise levels nor would it result in exposure to current

or future transportation noise levels in exceedance of standards. **Thus, a less than significant impact would occur under CEQA (CEQA Criteria C and D) and NEPA.**

Construction Vibration

A potential vibration source for beach nourishment would be construction equipment used for spreading activities. Sand, without silt or clay, is a poor medium for the transfer of vibrations, and the activity would not involve pile driving, soil compacting, jack-hammering, etc. that more typically generate vibration. Haul truck traffic also has the potential to generate intermittent vibrations; however, these activities would occur at relatively low vehicle speeds (approximately 30 mph), minimizing the potential for vibratory energy generated. Potential vibrations from haul truck traffic capable of human perception or structural damage is not anticipated (AECOM 2021d). **Thus, vibration impacts would be less than significant under CEQA (CEQA Criterion E) and NEPA.**

Operational Noise and Vibration

After beach nourishment is completed, no additional operational noise would occur; therefore, the analysis below focuses on temporary construction noise. **Activities related to soil management would not result in significant permanent noise or vibration impacts pursuant to CEQA (CEQA Criteria A, B, and E) or NEPA.** Similarly, as described above, the project is not proposing new land uses nor exposing construction workers to aviation noise within the Air Installation Compatible Use Zone noise contours. TETRP II Phase I would not result in new land uses that would expose people to current or future transportation noise levels. **Thus, no impacts would occur pursuant to CEQA (CEQA Criteria C and D) or NEPA.**

4.15.4 Avoidance, Minimization, and Mitigation Measures

The proposed project would not result in noise impacts that are significant under CEQA or NEPA; therefore, no mitigation is required.

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4.16 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

Under NEPA, "economic" and "social" effects are environmental consequences to be examined (40 CFR § 1502.16(b)). Under CEQA, the focus of an EIR is primarily on potential changes to the "physical conditions," which include land, air, water, flora, fauna, population, housing, noise, and objects of historic or aesthetic significance (PRC Section 21060.5; CCR Title 14 Section 15358(b) and Section 15382). The proposed project which would restore, to as near natural conditions as possible, a portion of the southern arm of Tijuana Estuary to intertidal wetlands, would result in no physical changes to population or housing.

Socioeconomics comprises the basic attributes and resources associated with the human environment, particularly population and economic activity. Economic activity typically encompasses employment, personal income, and industrial growth. Environmental justice considers whether the proposed project would disproportionately affect minority or low-income groups. For the purposes of this FEIR/EIS, regional economics includes population, demographics, and employment/income.

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (59 FR 7629), directs federal agencies to make environmental justice part of their missions by "identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations…" The CEQ has oversight of the federal government's compliance with EO 12898 and NEPA, and developed Environmental Justice Guidance Under the National Environmental Policy Act in 1997 to help federal agencies identify and address environmental justice concerns when conducting NEPA assessments (CEQ 1997). When determining whether effects stemming from proposed actions are disproportionately high and adverse, CEQ's guidance directs agencies to consider each of the following three factors to the extent practicable (CEQ 1997):

- Whether there is, or will be, an effect on the natural or physical environment that significantly (as defined by NEPA) and adversely affects a minority or low-income population or Indian Tribe. Such effects may include ecological, cultural, human health, economic, or social impacts that are linked to impacts on the natural or physical environment.
- Whether existing environmental effects are significant (as defined by NEPA) and currently or could in the future have an adverse impact on minority or low-income populations or Indian Tribes. Such effects may include any environmental effects that would appreciably exceed, or are likely to appreciably exceed, those on the general population or other appropriate comparison groups.
- Whether environmental effects occur, or would occur, in a minority or low-income population or Indian Tribe affected by cumulative or multiple adverse exposures from environmental hazards.

Guidance for incorporating environmental justice into the NEPA process is also guided by EO 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (86 FR 7009), which directs federal agencies to assess whether, and to what extent, underserved communities face systemic barriers in accessing opportunities and benefits available pursuant to the agency's policies and programs. EO 13985 also requires federal agencies to develop a plan for addressing barriers.

To assess the potential for impacts related to socioeconomic and environmental justice, data are presented at the local, county, regional, state, and national levels to analyze baseline socioeconomic and environmental justice community conditions in the context of regional and state trends. Data have been collected from the U.S. Census Bureau and previously published documents issued by federal, state, and local agencies. The information and analysis in this section is based in part on 2019 American Community Survey 1-Year Estimates from the U.S. Census Bureau. The detailed region of influence (ROI) for socioeconomic and environmental justice analysis is defined as the county and independent cities surrounding the estuary. This includes the County of San Diego and the cities of San Diego and Imperial Beach. The analysis also considered census tract data from the U.S. Census Bureau's 2020 DEC Redistricting Data.

In addition to the need for examining potential social and economic impacts to local and regional populations, as presented above, NEPA documents must also consider the potential for disproportionate environmental impacts to minority or low-income populations, as well as potential disproportionate environmental health and safety risks to children, as required by EO 13045, in order to comply with all relevant federal executive orders.

4.16.1 Affected Environment

To provide a localized socioeconomics and environmental justice context for the proposed project, this section presents information on population, demographics, local economy, and income in the project site for populations that reside within the areas that would be subject to project activities.

Population and Demographics

According to the CEQ Environmental Justice Guidance environmental justice guidelines, minority populations should be identified when the minority population percentage either exceeds 50% or the minority population is meaningfully greater than the minority population in the general population or in a meaningful geographic area.

Within the project site, there is no human population. However, the project site is surrounded by communities including the City and County of San Diego and the City of Imperial Beach, which are identified as the reference population for general context (Table 4.16-1). In the County of San Diego,

the minority populations are identified as Native Hawaiian and Other Pacific Islander, American Indian and Alaska Native, Black or African American, Asian and Two or More Races (Table 4.16-2, Minority Populations in the Region of Influence). Additionally, the majority of the potential haul route alignments proposed for use by construction traffic and material transport pass through areas with little or no residential development. The affected area is located primarily within census tract 06073010109, as included in Tables 4.16-1 and 4.16-2. Other areas that could be affected by project-related truck traffic include portions of census tracts 06073010110, 06073010111, and 06073010112.

Table 4.16-1
Population for Region of Influence

Geography	Population (people, 2020)	Growth (2010 to 2020)
County of San Diego	3,298,634	6.6%
City of San Diego	1,386,932	6.1%
City of Imperial Beach	26,137	-0.71%
Census Tract 06073010109	4,597	0%

Source: U.S. Census Bureau (2021)

Table 4.16-2
Minority Populations in the Region of Influence

Geography	White Alone, Not Hispanic or Latino	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Hispanic or Latino Alone	Two or More Races	Total Population
County of San Diego	45%	5.5%	1.3%	12.6%	0.6%	34.21%	4.6%	3,338,330
City of San Diego	42.9%	6.5%	0.4%	16.7%	0.4%	30.1%	5.2%	1,423,851
City of Imperial Beach	30.7%	5%	1.7%	7.5%	0%	52.3%	9.4%	27,440
Census Tract 06073010109	2.9%	1.5%	0.1%	2.1%	0.0%	92.3%	1.1%	6,517

Source: U.S. Census Bureau (2018; 2019; 2020)

Regional Economy and Income

Low-income populations include a person whose median household income is at or below the annual statistical poverty thresholds from the U.S. Census Bureau. In 2017, the Federal Department of Health and Human Services (HHS) Poverty Guidelines established an income threshold for a four-person household at $24,600 (HHS 2017). Those households that fall below the applicable threshold based on household size meet the minimum eligibility requirements for income-based programs and are considered low-income.

The County of San Diego largest workforce industries includes professional services, leisure services, education and healthcare, and government (County of San Diego 2019). In the City of San Diego, the leading industries include international trade, manufacturing, military, and tourism (City of San Diego 2020b). The leading employment industry sectors in the City of Imperial Beach are financial activities, construction, and professional/business services (City of Imperial Beach 2020). Table 4.16-3, Local Economy in the Region of Influence, identifies the median household income, labor force, and poverty rate within the ROI.

Table 4.16-3
Local Economy in the Region of Influence

Geography	Median Household Income	Labor Force[1]	Poverty Rate
County of San Diego	$74,855	62.9%	11.5%
City of San Diego	$75,456	65%	13.8%
City of Imperial Beach	$51,838	60.4%	20%
Census Tract 06073010109	$46,788	70.0%	18.4%

[1] In civilian labor force, total, percent of population age 16 years+, 2014-2018
Source: U.S. Census Bureau (2018; 2019)

Census Tract Information for the Project Site and Surrounding Area

The project site and surrounding area are identified as the affected population in the context of environmental justice. Although there is no human population within the project site, the haul routes proposed for construction traffic and material transport pass through areas with residential developments, as described further below. The restoration site is situated within two census tracts (06073010201 and 06073010109). Census tract 06073010201 includes much of the undeveloped coast line within the Tijuana River Valley, as well as developed portions of southwestern Imperial Beach, as shown in Figure 4.16-1. There are no residences or private properties in the general vicinity of the restoration site. The nearest residences are approximately 1.2 miles to the north in Imperial Beach and 1.29 miles to the east along Monument Road. The closest public uses other than trails include a County of San Diego campground approximately 3,000 feet to the east of the restoration site, and Friendship Park at the southwestern corner of Border Field State Park.

The project site and surrounding area are supported by a limited street system, with only two routes available for transporting excavated material from the project site to the Nelson Sloan Quarry and/or to other off-site locations for beneficial use or disposal at a landfill via I-5. For transport to the Nelson Sloan Quarry, the only route available is via Monument Road, which extends through census tract 06073010109. Approximately 12 residences are located along this section of Monument Road.

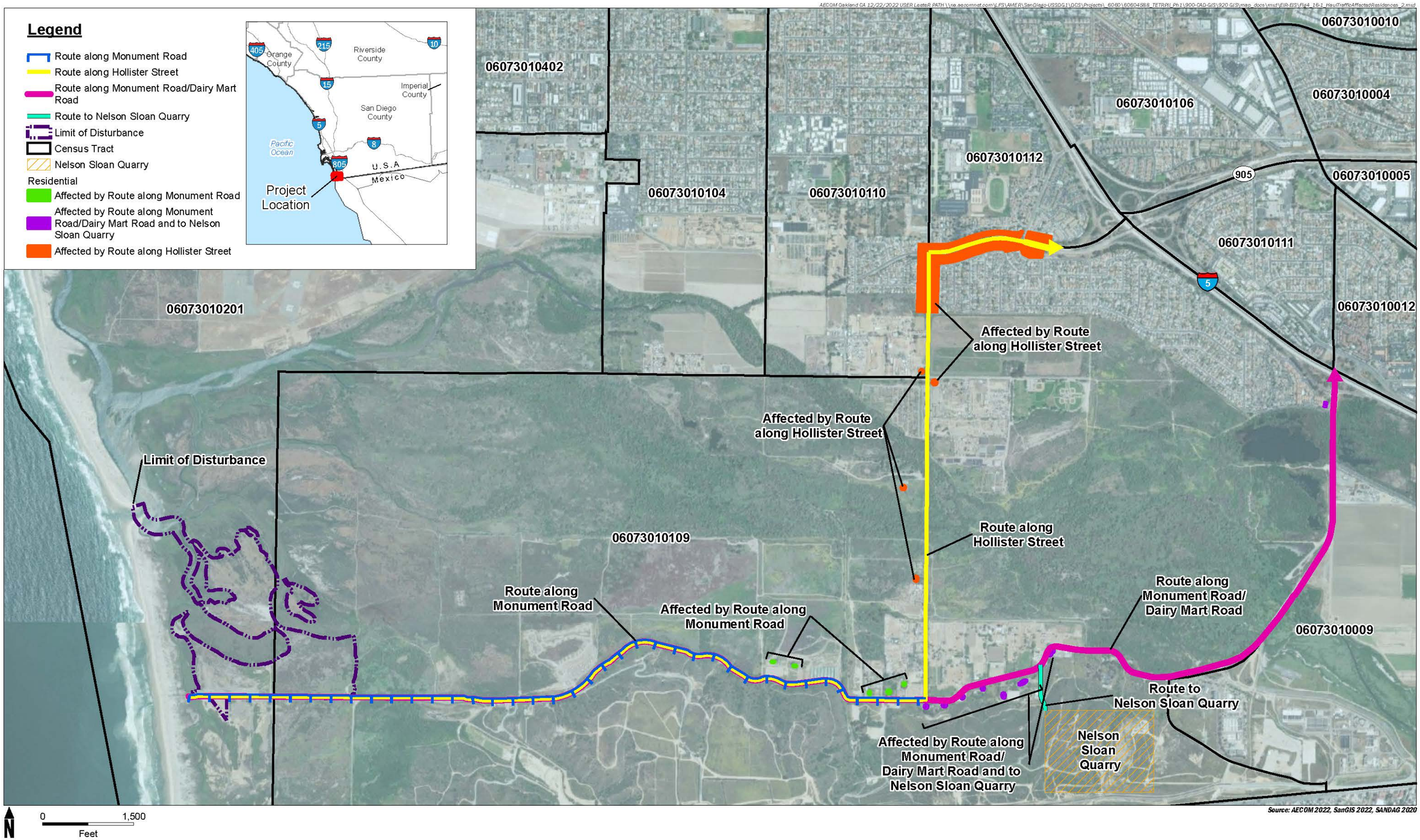

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FIGURE 4.16-1
HAUL TRAFFIC AFFECTED RESIDENCES

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Access to off-site locations outside the Tijuana River Valley via I-5 is only available from one of two travel routes: (1) Monument Road to Hollister Street north, to Tocayo Avenue east, to I-5, and (2) Monument Road to Dairy Mart Road to I-5. The northern route extends through census tract 06073010109, along the southeastern boundary of census tract 06073010110, and the southern boundary of census tract 06073010112. Under the first option, approximately eight residences are located along Monument Road within census tract 06073010109 and an additional 35 residences are located east of Hollister Avenue and south of Tocayo Avenue within this census tract. Approximately 15 residences that back onto Hollister Street are located within census tract 06073010110; approximately 40 multiple residential units are located to the north of Tocayo Avenue in census tract 06073010112. The southern route extends through census tract 06073010109, with approximately 14 residences located along the route, as shown in Figure 4.16-1.

Table 4.16-4 provides census information for the various census tracts that could be affected, depending upon the route ultimately selected for off-site transport of excavated material. Census tract 06073010111 is located east of I-5 between the Dairy Mart Road interchange and Tocayo Avenue interchange. Although the project site is included within census tract 06073010201, as stated above, no populations within this tract are in proximity to the project site or along any potential truck routes.

Table 4.16-4 presents the race and ethnicity composition of each potentially affected census tract based on 2020 census figures (https://censusreporter.org, accessed on 11/21/2022). Additionally, with the exception of census tract 06073010109, which has approximately 3.7% of persons living below the poverty line, the percent of persons living below the poverty line in the remaining census tracts ranges from approximately 18% to 25.5%. Within the City of San Diego, approximately 11.8% of the population lives below the poverty line, and the countywide rate for San Diego is approximately 11% (https://censusreporter.org, accessed on 11/21/2022).

Table 4.16-4
Census Information for Areas Influenced by Project Activities

Census Tract[1]	06073010109	06073010110	06073010111	06073010112	06073010201 (includes project site[3])	San Diego County[4]
Population	5,304	7,567	3,724	5,633	3,358	3,286,069
Race & Ethnicity[2]	78% Hispanic 12% White 4% Asian 3% Black 3% 2+	64% Hispanic 12% White 10% Asian 4% Islander 1% Black 9% 2+	90% Hispanic 6% White 1% Asian 3% Black 1% 2+	84% Hispanic 8% White 3% Asian 4% Black 2% 2+	39% Hispanic 50% White 7% Asian 4% Black	74.6% White[5] 34.8% Hispanic 12.9% Asian 5.6% Black 1.4% American Indian/ Alaska Native 4.9% 2+
Per Capita Income	$26,037 (±$4,130)	$21,078 (±$3,431)	$16,610 (±$2,591)	$16,666 (±$2,710)	$34,547 (±$8,300)	$39,737 (±$356)
Median Household Income	$85,171 (±$10,975)	$56,537 (±$23,876)	$49,217 (±$4,545)	$48,644 (±$6,936)	$75,322 (±$17,936)	$82,426 (±$734)
Persons below the Poverty Line	3.7% (±2.1%)	18.2% (±8%)	20.4% (±9.6%)	25.5% (±9.2%)	30.8% (±10.1%)	10.9% (±0.3%)

1 Data Source (unless otherwise noted): https://censusreporter.org (location of each census tract is provided in Figure 4.16-1).
2 Margin of error is at least 10%of the total value.
3 Housing in this Census Tract is approximately 7,000 feet to the north of the restoration site and is separated from the project by preserved lands. No impacts from the proposed restoration are anticipated and trucks will not take access through the developed portion of this Census Tract.
4 https://www.census.gov/quickfacts/fact/table/sandiegocountycalifornia/RHI125221#RHI125221; Population estimates base, April 1, 2020.
5 43.8% white alone, not Hispanic or Latino

4.16.2 CEQA Thresholds of Significance

Under CEQA, evaluation of population, housing, social, and/or economic effects that may result in physical impacts require consideration. CEQA also considers whether economic and/or social effects may be a factor in the significance of a physical change. Since no housing would be constructed with this project and no increase in population is anticipated, CEQA analysis is not applicable and was not discussed further within the DEIR/EIS. No specific definition of significance criteria is required under NEPA.

4.16.3 Environmental Evaluation

The 1991 TETRP EIR/EIS did not evaluate socioeconomics and environmental justice; therefore, the following analysis is independent of the previous environmental document.

Socioeconomic Analysis

Overall, the social and economic effects of the action would be beneficial. The estuary represents a valuable coastal salt marsh habitat with substantial biological and ecological resources. TRNERR provides habitat for sensitive plants and wildlife and recreational opportunities including trails and beach access. TETRP II Phase I may potentially increase ecotourism in Imperial Beach and Border Field State Park (e.g., restoration of the western salt ponds resulted in an increase in birding enthusiasts visiting the San Diego Bay NWR). The potential reuse of material would result in beaches with wider and larger sand areas, which would provide greater recreational opportunities and enhanced tourism in the region.

Alternative 1

Design and construction work associated with implementation of Alternative 1 would likely be conducted by civilian firms that would largely draw their employees from a labor pool within San Diego County, but some specialized contractors, such as dredge contractors could come from outside the region. Given the temporary nature of the construction, and minimal staffing requirements for dredging operations, an increase in population would not occur because workers would not need to relocate to the area. Similarly, demand for local housing is not anticipated to occur because most of the construction work would be performed by workers residing within commuting distance of TRNERR.

During construction, localized, temporary socioeconomic impacts could potentially accrue due to the proximity of sensitive receptors (such as residential areas adjacent to potential haul routes) to the proposed limits of construction. These localized socioeconomic impacts may include changes to community character and could result from construction noise, a temporary degradation of air quality,

traffic disruptions, and/or altered access to socially important land uses, but would not affect housing overall. These disruptions would cease at the end of construction. Temporary impacts to employment and the local economy would be slight but likely beneficial. **Overall, temporary impacts to employment, income, population, and housing would not result in significant effects pursuant to NEPA.**

Alternative 1 would not result in a permanent population increase or change in housing demand. Economic output as a result of Alternative 1 is anticipated to be beneficial, although slight, as community members and visitors would have a new opportunity to visit and enjoy a more dynamic and diverse estuary ecosystem with more expansive sandy areas along the beach However, the potential increase in visitors as a result of these enhanced opportunities would not be of the magnitude that would create secondary or indirect environmental effects. **Therefore, impacts on existing regional population and associated housing, employment rates, and regional economy would largely remain unchanged as a result of Alternative 1 and would not result in significant effects pursuant to NEPA.**

Proposed Project

Temporary and permanent impacts to local socioeconomics with implementation of the proposed project would be similar to Alternative 1 discussed above. **Therefore, no significant effects to socioeconomics pursuant to NEPA would result with the proposed project.**

No Project/No Action Alternative

No adverse impacts would occur to local socioeconomics as a result of the No Project/No Action Alternative. However, the No Project/No Action Alternative would not provide an economic benefit and the project site would remain in its current state. Recreational opportunities and tourism value would not experience a beneficial impact as compared to implementation of Alternatives 1 or 2. **Overall, no significant impacts pursuant to NEPA would occur under this alternative.**

Environmental Justice Analysis

This section summarizes any disproportionately high and adverse human health or environmental effects on minority and low-income residents, as mandated by EO 12898, that could result from the implementation of Alternative 1 or the proposed project. Those residents located along potential transport routes used for trucking excavated material from the project site to other receiver sites (as shown in Figure 4.16-1) are the populations most likely to be affected by project activities. These roadways are used by adjacent residents for everyday use. In addition, they are used by land managers and the public to access primarily recreational opportunities. EO 12898 also requires the assessment of potential impacts that may disproportionately accrue to children.

In doing so, it is important to document those land uses surrounding the project site that are likely to contain a higher portion of children (considered under 18 years of age) throughout the course of a day. Schools and daycare centers are not within the vicinity of the restoration and enhancement areas of the project site, nor are they expected to be impacted by haul truck traffic. Truck traffic would, however, be routed along streets bordered by residential development, resulting in potential temporary increases in noise, exhaust emissions, and traffic congestion. Since the project site is located within the TRNERR, it is considered an open space area that provides recreational and educational opportunities for children and the general public.

Overburdened communities are considered minority, low-income, Tribal, or indigenous populations or geographic locations in the United States that potentially experience disproportionate environmental harms and risks. This disproportionality can result from greater vulnerability to environmental hazards, lack of opportunity for public participation, or other factors. Increased vulnerability may be attributable to an accumulation of negative, or the lack of positive, environmental, health, economic, or social conditions within these populations or places. The term describes situations where multiple factors, including both environmental and socio-economic stressors, may act cumulatively to affect health and the environment and contribute to persistent environmental health disparities (EPA 2016). Several of the affected communities, especially areas near major roadways, experience burdens for multiple environmental indicators including poor air quality (e.g., PM2.5 and diesel PM) and traffic-related impacts.

Per CEQ guidance regarding environmental justice (1997), significance of impacts, including consideration of context (e.g., an incremental increase in impacts to a highly overburdened community) and intensity as defined by NEPA, is a factor for determining whether the impacts are disproportionately high and adverse. The potential for such impacts depends on the context and intensity of the impacts most relevant to the communities with environmental justice concerns. An analysis of whether environmental inequities exist in the communities surrounding the potential haul routes determined that minority and lower income populations are prevalent within the census tracts potentially affected by truck traffic generated by the project.

The existing roadways within Tijuana River Valley, as well as the two potential haul routes for the project and existing residences in proximity are presented in Figure 4.16-1. Table 4.12-1 in Section 4.12, Transportation, presents the various roadway capacities, current ADTs, and near-term ADTs with project-related ADT added. The traffic volumes on all roads, with the exception of Dairy Mart Road, are expected to remain under capacity when considering near-term (2024) traffic increases and temporary increases in traffic due to construction-related traffic associated with TETRP II Phase I. The traffic volumes on Dairy Mart Road near I-5 southbound already exceed roadway capacities; however, these roadways are not expected to be impacted by the proposed project. The traffic volumes provided in Table 4.12-1 differ from the CalEnviroScreen data, accessed on 11/21/2022 (OEHHA 2022), which indicate that the traffic density percentile for the

census tract that includes these roadways (e.g., Monument Road, Hollister Street, Dairy Mart Road, Tocayo Avenue), is higher than 100% of the census tracts in California. This is calculated based on "the average traffic volumes per amount of roadways within the area." The presence of portions of Dairy Mart Road and the portion of I-5 that extends from Dairy Mart Road north to I-905, both of which support travel volumes that exceed roadway capacity likely influence the CalEnviroScreen data.

The percentiles for PM2.5 values, Diesel PM values, and Ozone values for the area to be potentially affected by haul truck trips are provided by EJScreen (EPA 2022) and CalEnviroScreen mapping tools (OEHHA 2022):

- PM2.5 values are in the 23rd percentile for California and the 83rd percentile nationwide (EPA 2022); PM2.5 values are in the 94th percentile for California (OEHHA 2022);
- Diesel PM values are in the 38th percentile for California and the 65th percentile nationwide (EPA 2022); Diesel PM values are in the 21st percentile for California (OEHHA 2022);
- Ozone values are in the 30th percentile for California and the 50th percentile nationwide (EPA 2022); Ozone values are in the 30th percentile for California (OEHHA 2022).

Alternative 1

As discussed in previous sections of this document, construction activities have the potential to create temporary indirect negative effects on nearby residents and visitors, such as increased noise levels, air pollutant levels, hazardous materials, traffic, or decreased visual quality. However, as discussed in the specific topic analysis for these issue areas, implementation of Alternative 1 would be temporary and effects would cease when construction activities are completed. The incremental amount of noise, pollution, traffic, and visual disruption caused by construction for restoration and enhancement within the project site is anticipated to be minimal and not of the magnitude to create substantial adverse effects to the human population in the surrounding area, including children or minority and/or low income populations who may be using recreational facilities within TRNERR adjacent to the project site. Additionally, there are many recreation opportunities within TRNERR center around the Visitor Center and also within Border Field State Park and these locations would not be affected by project construction. Areas of construction and potential beach nourishment would be restricted during project implementation for safety reasons and no long-term health and safety effects would occur after construction is complete and areas were reopened for public use. Further, adherence to state and federal requirements would minimize risk and exposure of workers, the public, or the environment to hazardous waste or materials for both construction and operational activities.

The use of heavy trucks along the haul routes has the potential to create temporary negative effects, such as increased noise, air emissions, and traffic for residents in immediate proximity to the

affected roadways. Although these impacts would affect all residents equally, regardless of race, ethnicity, or income, Hispanic residents living in proximity to the potential haul routes represent from 64% to 90% of the residents within the affected census tracts. In addition, the percentage of persons living below the poverty line within the affected census tracts ranges from 3.7% in census tract 06073010109 to 25.5% in census tract 06073010112 (see Table 4.16-4).

Whether restoring coastal wetlands within the Tijuana Estuary under Alternative 1 or the proposed project, each will generate some level of construction-related truck traffic on the roadways within the Tijuana River Valley. The selected haul route alignments were not optional or specifically routed through the area, rather they represent the only roadways through the Tijuana River Valley available for transport of excavated material that cannot be beneficially used within the project site. The need for and the number of haul truck trips will differ between alternatives as described in Section 4.12. In both cases, project implementation could affect residents in census tracts 06073010109, 06073010110, 06073010111, and 06073010112 (see Figure 4.16-1). As stated previously, residents located in census tract 06073010201 are located well to the north of the restoration site; therefore, impacts, including but not limited to noise, dust, and access, are not anticipated as a result of project implementation, and no haul routes are proposed in the northern portion of this census tract.

The impacts from the implementation of either alternative that are most relevant to environmental justice are the temporary increases in noise, emissions, and traffic associated with hauling excavated material from the project site along the designated potential haul route(s). Construction-generated trips are anticipated to potentially affect adjacent residences, but would also influence landowners and the public using the road and therefore does not disproportionately affect the environmental justice community. Various options have been considered for the use of the excavated material, including beneficial reuse through placement within the swash zone or on dry portions of the beach, which if feasible would result in a reduction in the number of off-site truck trips generated by the project. Other options include beneficial reuse in the restoration of the Nelson Sloan Quarry, as described in the Draft EIR prepared for the project by California State Parks (2021); beneficial reuse as off-site locations that are yet to be determined, and disposed at a designated landfill, most likely the Otay Landfill.

Under Alternative 1, assuming a worst-case scenario in which all but 5,000 cy of the 585,000 cy of excavated material from the restoration site are exported off-site, approximately 508 round trips (254 trips each way) would be generated by the project. The trips would occur over a period of 6 months, which could occur concurrently or over two seasons. Once the excavated material that needs to be transported off-site has been removed, the proposed project-related trips are anticipated to be marginal. Because the proposed project itself is not expanding or constructing new roadway facilities, and is instead restoring tidal wetlands, traffic is not anticipated to noticeably increase on the roadways entering and exiting the Tijuana River Valley post-restoration.

While these effects of the haul trips have the potential to be significant adverse issues if prolonged or permanent, the impacts would be temporary, lasting the duration of activities that require off-site material transport. In addition, to minimize community disruption from haul truck traffic, a Traffic Control Plan will be developed in association with the final construction plans that will take into consideration the location(s) identified for off-site disposal of project generated soil. The Traffic Control Plan will identify appropriate haul routes and assign how trips would be distributed among appropriate haul routes to minimize impacts to adjacent residents. In addition, a public information program will be put in place to assist the surrounding community in understanding the purpose of the proposed project and to disseminate pertinent project information in languages accessible to the community that address restoration, construction schedules, and haul truck activity. The effects to adjacent residents from haul truck activity would be temporary and would not be of the magnitude or longevity to create substantial adverse effects to the environmental justice population of the area.

As stated in Section 4.11.3, visitors using Beach Trail, Friendship Park, and beach west of the dunes would experience a strong visual contrast during restoration activities because of the overall change and likely perceived degradation in visual character. These visitors may include both members of the local minority communities and others. Visitors would have higher scenic expectations, and the construction phase would represent a temporary change in the visual quality and character of the estuary for key viewers, but impacts would not be significant. While the overall geographic area includes both low-income and minority populations, the Refuge and beach are open and available to visitors and attracts recreationalists from the region. Therefore, significant visual impacts would not disproportionately accrue to environmental justice populations.

No permanent impacts to environmental justice communities would occur as a result of implementing Alternative 1 because no permanent, adverse human health, safety, or social impacts would remain after construction is complete. To avoid short-term impacts to residences as a result of project-related haul truck traffic, Standard Construction Practices (Table 3-10), including development of a public information program and a traffic control plan, will be implemented to ensure that residents located along potential haul routes are alerted to upcoming construction activity and provided with appropriate project contact information. Additionally, the surrounding communities have been engaged throughout the proposed project and have had the opportunity to provide meaningful input during the public scoping and public comment period as discussed in Section 1.5. **Therefore, significant impacts to environmental justice communities would not occur and no minority or low-income population group would bear a disproportionate share of adverse environmental and socioeconomic impacts.**

Proposed Project

Similar to Alternative 1, construction activities have the potential to create temporary indirect negative effects on nearby residents and visitors (e.g., noise levels, hazardous materials, air pollutants, traffic, decreased visual quality). However, these temporary, incremental disruptions would be temporary, minimal, and not large enough to cause adverse effects to human health, safety, or social impacts in the surrounding area.

Potential effects along the haul route due to off-site material disposal activities would affect minority populations based on census data for the area encompassing the haul route alignment. Similar to Alternative 1, these effects, such as increased noise, air pollutants, and traffic, have the potential to be significant adverse issues if prolonged or permanent. However, effects would be short-term nuisances to residences along the haul route but would not be of the magnitude or longevity to create significant adverse effects to the environmental justice populations of the area. As described for Alternative 1, a Traffic Control Plan will be developed in association with the final construction plans that will take into consideration the location(s) identified for off-site disposal of project generated soil. The Traffic Control Plan will identify appropriate haul routes and assign how trips would be distributed among appropriate haul routes to minimize impacts to adjacent residents. In addition, similar to Alternative 1, a public information program will be put in place to keep the surrounding community informed about project activities and schedules, including information about haul truck schedules.

As described with Alternative 1 above, construction would affect visual resources during restoration activities and may temporarily impacting the visitor experience. However, the impacts would not disproportionately accrue to environmental justice populations who may visit.

The details of design and project implementation, including development of a public information program and a traffic control plan, would be similar to Alternative 1 and no permanent or short-term, adverse human health, safety, or social impacts would occur during or remain after project implementation; **therefore, a significant impact to environmental justice communities would not occur with the proposed project, and no minority or low-income population group would bear a disproportionate share of adverse environmental and socioeconomic impacts.**

No Project/No Action Alternative

No adverse impacts would occur to human health, safety, or social values as a result of the No Project/No Action Alternative. **No significant or disproportionate impacts to environmental justice communities have been identified.**

4.16.4 Avoidance, Minimization, and Mitigation Measures

No adverse effects or significant impacts on socioeconomics, or significant adverse impacts that would accrue disproportionately to environmental justice communities, have been identified with implementation of Alternatives 1 or 2 or the No Project/No Action Alternative. No mitigation measures are required.

4.17 PUBLIC SERVICES AND UTILITIES

This section summarizes the public services and utilities in the project site, including the southern arm of Tijuana Estuary, the river mouth, and proposed adjacent beach nourishment sites. This restoration project does not increase the demand for public services or utilities, so this analysis focuses on the potential for disruption of service and infrastructure.

4.17.1 Affected Environment

Various utility infrastructures are within the project site. Multiple service providers, jurisdictions, and agencies own and maintain these utilities, such as San Diego Gas & Electric (SDG&E) and the City of San Diego. The existing utility infrastructure is described below. Other public services, such as libraries, schools, and other similar services, would not be affected by the proposed project and are not discussed further.

Sewer

The SBIWTP is a secondary treatment plant operated by the International Boundary and Water Commission, U.S. Section (USIBWC) located east of the project site next to the international border. In addition to treating up to 25 million gallons per day, the plant receives diverted water from the Tijuana River in Mexico, including dry weather flows diverted from upstream canyons (e.g., Goat Canyon Low Flow Diverter, Smuggler's Gulch Low Flow Diverter, Canyon del Sol, Silva Drain, and Stewarts Drain). The SBIWTP treats this wastewater to an advanced primary level before discharging it into the Pacific Ocean through the 4.5-mile-long South Bay Ocean Outfall (SBOO). The SBOO is located just south of Monument Road and runs parallel to the international border before discharging effluent in approximately 100 feet of water (City of San Diego 2016). The Goat Canyon Low Flow Diverter conveys low flow events in subsurface infrastructure within Goat Canyon to the Goat Canyon pump station east of the Border Field State Park entrance. During most rain events or other large flow events, sewage from the Tijuana River crosses the international border and flows into TRNERR and subsequently the Pacific Ocean.

The South Bay Wastewater Reclamation Plant was constructed by the City of San Diego Metropolitan Waste Water District (MWWD) and is located at the intersection of Monument Road and Dairy Mart Road next to the SBIWTP. This wastewater reclamation facility treats 15 million gallons per day of local U.S. wastewater and provides reclaimed water to the South Bay. Secondary level treated water is discharged through the SBOO while tertiary level treated water is used for reclaimed purposes.

During the mid-1900s era, sewer outfall infrastructure was located within the project site. This infrastructure has been abandoned for many years and is believed to run parallel slightly north of

Beach Trail. Evidence of this existing infrastructure can be seen on the beach west of the project site with a 6-foot-diameter concrete standpipe, which can be seasonally covered by sand.

Water

Water mains extend from main lines located within the I-5 corridor, including a 16-inch main line that extends along Hollister Road to the intersection with Monument Road located east of the project site. Border Field State Park's utility water meter is located on the south side of Monument Road within Smuggler's Gulch. Within the TRNERR, a 6-inch-diameter water line follows the alignment of Monument Road approximately 2 miles to Monument Mesa. Along the east-west alignment of Monument Road, the water line lies near the road's center line. When the direction of Monument Road turns south, the line is located along the shoulder of the roadway. Several connections branch from this line to service park facilities and minor habitat restoration irrigation infrastructure as well as a native plant nursery. Water is available to the public at the entrance to Border Field State Park and at upper and lower areas of Monument Mesa.

Electricity and Telephone

SDG&E provides electrical and telephone services to the San Diego region, including the project site. An overhead electrical and telephone services transmission line is located along the north side of Monument Road until the entrance of Border Field State Park. From there, this overhead system terminates into a below-ground system where it then follows the center-line of Monument Road to Monument Mesa. Several connections branch from this line within TRNERR to service park facilities. Additionally, an electrical pole that serves the CBP is located at the junction of Monument Road and Beach Trail. Aluminum co-axial cable and fallen power poles remain on the surface throughout the project site from past military research on radio communications.

Natural Gas

SDG&E is the natural gas service provider for most of the San Diego region. However, there is no operating gas line or natural gas services within TRNERR.

Solid Waste

In the areas surrounding the project site, the City of Imperial Beach has an exclusive franchise agreement with EDCO Waste and Recycling Services to provide waste collection services for both residential and commercial customers. The City of San Diego provides solid waste collection services to residential and commercial accounts. CSP contracts for solid waste pick-up to support visitors and operations, including several 4-yard and 40-yard containers. CSP also contracts an annual clean-out of the Goat Canyon Sediment Basins, southeast of the project site; this effort

includes the removal of roughly 40,000 cy of sediment and solid waste annually. There are no active or closed solid waste disposal sites within the project site.

Lifeguard and Emergency Services

Emergency response to the project site and surrounding open space is primarily via Monument Road and Beach Trail. Beach Trail provides one of three primary vehicular access points for emergency response to the beach adjacent to the project site. The beach may also be accessed by authorized vehicles at Monument Mesa and via Seacoast Drive in Imperial Beach north of the river mouth. However, vehicular access to the project site from Seacoast Drive is limited by mouth of the Tijuana River. Recreationalists may access the beach via Monument Mesa, Beach Trail, or Seacoast Drive.

CSP Lifeguards and Rangers and USFWS Law Enforcement Officers respond to emergencies within TRNERR and are primarily dispatched from Silver Strand State Beach lifeguard headquarters, San Diego Bay NWR, or the Tijuana Estuary Visitor Center. Additionally, peace officers conduct regular patrols of the project site and surrounding areas. Lifeguard towers are not present at the beach and lifeguard services are not supported as part of the day-to-day operations. Although swimming is permitted in the ocean, swimming, wading, diving, fishing, watercraft, and other water-based recreation are not permitted within the tidal channels of the estuary. City of San Diego, City of Imperial Beach, and San Diego County provide occasional lifeguard and public safety services to the area as needed. Fire Departments for the cities of Imperial Beach and San Diego provide emergency fire response to the project site and surrounding areas.

U.S. Customs and Border Protection

CBP has 24-hour presence at the international border located south of the project site. CBP maintains a series of fortified fences and a Border Infrastructure System (BIS) consisting of roads and access points directly adjacent to the international border with Mexico. The BIS is connected to regional transportation infrastructure via a system of easement roads through Border Field State Park and other adjacent open-space lands. The BIS also provides access to the beach for CBP patrol. Public access is not allowed use of the BIS; however, CBP allows some discretionary use by authorized personnel of the BIS for emergency response and regular park management activities.

4.17.2 CEQA Thresholds of Significance

Would the project:

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:

- Fire protection
- Police protection
- Schools
- Parks
- Other public facilities

b) 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;

c) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;

d) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;

f) 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

g) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

4.17.3 Environmental Evaluation

The 1991 EIR/EIS found that implementation of the overall restoration project would not result in impacts to utilities. Thus, potential public services and utilities impacts are analyzed below as a result of implementation of TETRP II Phase I and are discussed separately from the analysis identified in the 1991 TETRP EIR/EIS.

4.17.3.1 Restoration/Enhancement

Alternative 1

Construction

Construction activities increase the potential for accidental on-site fires from such sources as the operation of mechanical equipment and use of flammable construction materials. In most cases, the implementation of standard construction practices (Table 3-9) by the construction contractors and work crews would minimize these hazards. These procedures include the maintenance of mechanical equipment in good operating condition, careful storage of flammable materials in appropriate containers, and the immediate and complete cleanup of flammable materials spills when they occur. Staging and access areas would be located in previously disturbed areas with minimal vegetation to minimize the risk of accidental ignition of surrounding vegetation.

Vegetation would be removed prior to construction in restoration and enhancement areas to minimize the risk of potential fires.

When not properly secured, construction sites can become targets for trespassing and other illegal activities that must be dealt with by local law enforcement. Per standard construction practices (Table 3-9), during non-work hours, heavy equipment, vehicles, and fuel storage would be secured away from publicly accessible areas, creating physical barriers to trespassing and minimizing the need for police involvement.

The majority of restoration and enhancement activities would occur within the estuary itself and would not be of the nature to impact local parks. Restricted access, or increased usage, or modification of local parks would not result from Alternative 1.

The nearest lifeguard towers are located approximately 2 miles north of the river mouth at the south end of Imperial Beach. Due to distance from the estuary, restoration and enhancement activities would not have the potential to disrupt public safety services provided by this lifeguard tower. Emergency lifeguard services to the beach west of the project site would not be interrupted as access routes via Seacoast Drive and Monument Mesa would be maintained. CBP operations would not be interrupted because the BIS access would not be interrupted by construction activities associated with Alternative 1 as this infrastructure is located outside of the project site.

As discussed in Section 4.12, Transportation, construction activities associated with restoration and enhancement activities are not anticipated to generate traffic volumes that could cause poor traffic operating conditions on local roadways. In addition, if disruption of traffic is anticipated (e.g., lane closure, detour, or similar action), a Traffic Control Plan will be required as listed in Table 3-9 and

would outline appropriate traffic control measures intended to provide adequate access throughout the construction areas. As such, adequate emergency access would be maintained throughout the construction period.

Therefore, implementation of Alternative 1 would not require the establishment of new public service facilities or cause physical impacts associated with the provision of new or altered facilities. **A less than significant impact related to the provision of public services under CEQA (CEQA Criterion A) would result, and no significant impacts related to public services would occur pursuant to NEPA.**

Construction activities would require a nominal amount of water consumption and wastewater disposal. However, these activities are limited and temporary in nature, and would not consume water or generate wastewater in quantities that would affect the service providers' ability to supply adequate service or exceed the capacity of existing treatment facilities. **Thus, construction alternatives associated with implementation of Alternative 1 would not require new or expanded water or wastewater treatment facilities, and existing water supplies would be sufficient. Impacts would be less than significant under CEQA (CEQA Criteria B and D), and no significant impacts to existing water or wastewater treatment facilities or the area's existing water supply would occur pursuant to NEPA**.

Water consumption associated with Alternative 1 would be limited and would be required during initial construction, the plant establishment period, and maintenance activities. Planting activities associated with Alternative 1 would involve minimal water use, as the majority of habitat types that would be established would be inundated by tidal waters. Restoration activities within upland/transitional areas outside of tidal influence would utilize a drought-resistant native plant palette that would require temporary irrigation during plant establishment. **Therefore, impacts to available water supplies related to restoration activities would be less than significant under CEQA (CEQA Criterion C), and no significant impacts would occur pursuant to NEPA.**

Construction activities associated with Alternative 1 may generate construction waste, as well as vegetation removed from identified areas within the estuary. It should be noted vegetation removed would be considered green waste. In accordance with recycling trends in the City and County of San Diego, and incentives for recycling, the construction debris generated would likely be recycled, including the intent to beneficially reuse material to the extent possible through beach nourishment. However, conservatively assuming that none of the construction debris is recycled, this solid waste in addition to removed vegetation would need to be disposed at Otay Landfill. With a permitted capacity of 6,700 tons of solid waste per day, Otay Landfill would have sufficient remaining capacity to accommodate the solid waste disposal needs of Alternative 1. Additionally, materials would be handled and disposed of in accordance with existing local, state, and federal regulations. **Therefore, under Alternative 1, construction impacts related to landfill capacity**

and solid waste disposal regulations would be less than significant under CEQA (CEQA Criteria D through F), and no significant impacts pursuant to NEPA would occur.

Long-term Maintenance

Long-term maintenance activities are not anticipated under Alternative 1, although localized actions may be required to manage and maintain channel and wetland function. The river mouth may require periodic excavation to maintain an open condition. Additionally, Alternative 1 would not generate new permanent residents that would increase the demand for public services or utilities. **Thus, long-term maintenance of Alternative 1 would not result in the need for new or expanded public service or utility facilities and impacts would be less than significant under CEQA (CEQA Criteria A through F), and no significant impacts pursuant to NEPA would occur.**

Proposed Project

The proposed project is similar to Alternative 1, and restoration and other enhancement efforts that would occur under the proposed project would not change or alter public services and utilities effects as analyzed for Alternative 1 above both during construction and long-term; thus, discussions and conclusions identified under Alternative 1 are also applicable to the proposed project. **Therefore, the proposed project would not result in the need for new or expanded public service or utility facilities, and impacts would be less than significant under CEQA (CEQA Criteria A through F), and no significant impacts pursuant to NEPA would occur.**

No Project/No Action Alternative

Under the No Project/No Action Alternative, the proposed restoration and enhancement of the estuary would not be completed at the project site. No removal of soil or vegetation would occur, and no maintenance regime would be implemented. The No Project/No Action Alternative would not include construction activities that could disrupt service or utility infrastructure. Additionally, the No Project/No Action Alternative would not increase the demand for public services or utilities. **Therefore, the No Project/No Action Alternative would not result in the need for new or expanded public service or utility facilities, and no impacts would occur under CEQA (CEQA Criteria A through F) or NEPA.**

4.17.3.2 Soil Management

There are no existing utilities within the limits of the proposed adjacent beach nourishment site, and the transport and placement of material to beach and swash zone locations would not result in the need for new systems or substantial alterations to existing systems due to exceedance of

available capacity or an incompatibility with the project design. Implementation of soil management would not create uses that would require utilities. **Therefore, impacts related to demand for, or alteration of, utility systems would not occur under CEQA (CEQA Criteria A through C) or NEPA.**

Material would be removed from the estuary as part of soil management. As described in Section 3.3.2, the majority of soils removed from the estuary would be targeted for beneficial re-use for purposes such as beach nourishment. However, conservatively assuming the material excavated from the project site is transported to Otay Landfill, it would be within a permitted capacity of 6,700 tons of solid waste per day. The proposed project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure. **Therefore, impacts related to landfill capacity and solid waste disposal regulations would be less than significant under CEQA (CEQA Criteria D through F), and no significant effects would occur pursuant to NEPA.**

4.17.4 Avoidance, Minimization, and Mitigation Measures

The proposed project would not result in public services and utilities impacts that are significant under CEQA or NEPA; therefore, no mitigation measures are required.

4.18 ENERGY

This section considers the potential impacts related to energy consumption that could result during construction and operation of the proposed project. The analysis considers the proposed project's primary uses of energy and the potential for activities to result in the wasteful, inefficient, and unnecessary consumption of energy.

4.18.1 Affected Environment

Construction of the proposed project and ongoing maintenance would consume energy in the short-term through electricity use, construction vehicles and equipment fuel consumption, and bound energy in construction materials (e.g., such as concrete, pipes, and manufactured or processed materials). Construction would also require use of equipment for grading and hauling, which would be gas or diesel powered. To ensure that energy implications are considered in project decisions, CEQA requires that EIRs include an analysis of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy (see PRC section 21100(b)(3)). NEPA states that energy requirements and conservation potential of alternatives should be discussed (40 CFR § 1502.16(a)(6)).

Energy Use

In 2012, total statewide energy consumption in California was approximately 7,967 trillion British thermal units (Btus) (EIA 2020). California ranked second compared to other states in total energy consumption. However, the per-capita consumption rate in California is one of the lowest in the country and ranks 48th of the states (EIA 2020). This is largely because of California's proactive energy efficiency programs and mild weather, which reduces energy demands for heating and cooling. The transportation sector makes up the single largest consumer of energy in California, accounting for 39% of the state's total energy demand, and nearly most of this energy is provided by petroleum (EIA 2020). The industrial, commercial, and residential sectors are the next largest consumers of energy, primarily related to electricity and natural gas use.

Electricity generation is typically measured in gigawatt-hours (GWh), megawatt-hours (MWh), or kilowatt-hours (kWh). In 2018, total electricity consumed in California was 284,436 GWh (CEC 2018). Natural gas-fired generation is the primary source of electricity generation in California and fuels approximately 43% of electricity consumption. California's electrical system has also become more reliant on renewable energy sources, including cogeneration, wind energy, solar energy, geothermal energy, and hydroelectric plants. In 2019, 32% of electricity came from renewable resources such as wind, solar, geothermal, biomass, and small hydroelectric facilities. Large hydro plants generated another 16% of electricity in California (CEC 2019).

The San Diego region consumed approximately 20,297 GWh of electricity and 560 million therms of natural gas in 2010 (SANDAG 2014). Under status quo conditions, the San Diego region's total electricity consumption is expected to increase by approximately 55% by 2050 (31,583 GWh).

Energy Service Providers

SDG&E is the owner and operator of natural gas and electricity transmission and distribution infrastructure in the San Diego region. SDG&E obtained 63% of its energy from natural gas in 2012. SDG&E renewable energy is the second largest energy source and includes biomass and waste, geothermal, small hydroelectric, solar, and wind sources. SDG&E obtained 23.6% of its energy from renewable resources in 2013 (CPUC 2015). Additionally, SDG&E's other energy sources include coal and unspecified sources. SDG&E's long-term procurement plan includes up to 800 megawatts (MW) of new resources by 2022 with a minimum of 200 MW coming from energy efficiency, demand response, renewables, combined heat and power resources, and distributed generation.

4.18.2 CEQA Thresholds of Significance

Would the project:

a) Result in 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?

4.18.3 Environmental Evaluation

The 1991 TETRP EIR/EIS did not evaluate potential energy impacts. Therefore, TETRP II Phase I currently under evaluation in this tiered document will not rely on previous analysis, significance conclusions, or mitigation measures.

4.18.3.1 Restoration/Enhancement

Alternative 1

Alternative 1 would result in the consumptive use of energy required to operate machinery during construction, which may include the use of excavators, dredges, trucks, pumping equipment, and grading equipment. Elements of the proposed project design features and standard construction procedures outlined in Tables 3-8 and 3-9 lend themselves to energy savings, such as stockpiling material and placement in designated on-site fill areas, minimizing material that would otherwise be hauled to a landfill or other off-site disposal site. Additional project features that would promote energy efficiency and decrease overall energy consumption include PDF-5, which requires equipment and vehicle engines be maintained in good condition and minimize idling time, avoiding wasteful and

inefficient use of energy resources. Additionally, on-site and nearby reuse of material has been incorporated into Alternative 1 to minimize the energy utilized in transporting excavated materials as discussed in Section 4.18.3.2.

Once completed, Alternative 1 would not generate additional substantial daily vehicle trips, necessitate an increased need for ongoing energy use, or require other energy-consuming activities. Beyond periodic maintenance, it is not anticipated that Alternative 1 would require operational use of energy. Maintenance activities would be temporary and periodic in nature. Although Alternative 1 would require the use of a variety of energy resources during construction and occasionally for maintenance, **the energy used for Alternative 1 would not be considered wasteful, inefficient, or unnecessary and, as a result, a less than significant impact to energy resources would occur pursuant to CEQA (CEQA Criterion A) or NEPA.**

Alternative 1 would be constructed within the estuary and would not conflict with plans for renewable energy. Specific project design features and standard construction procedures have been incorporated into Alternative 1 that promote energy efficiency and decrease overall energy consumption. Further, energy use during construction would be temporary and operational energy use is not anticipated with the proposed project. **Therefore, Alternative 1 would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency, and no impacts would occur pursuant to CEQA (CEQA Criterion B) or NEPA.**

Proposed Project

The proposed project is designed to excavate less material than Alternative 1 to achieve the proposed habitat distribution. Construction activities that would occur under the proposed project are not of the magnitude to substantial alter energy use necessary to construct the proposed project. Additionally, use of excavated material has been incorporated into on-site features (i.e., transitional habitat areas), minimizing the amount of energy utilized to dispose of materials. As discussed in Section 4.18.3.2 below, on-site and nearby reuse of material has been incorporated into the proposed project to minimize the energy utilized in transporting excavated materials. **Thus, the energy used for the proposed project restoration and enhancement would not be considered wasteful, inefficient, or unnecessary and, as a result, a less than significant impact to energy resources would occur pursuant to CEQA (CEQA Criterion A) and NEPA. Additionally, the proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and no impacts pursuant to CEQA (CEQA Criterion B) or NEPA would occur.**

No Project/No Action Alternative

Under the No Project/No Action Alternative, the proposed TETRP II Phase I restoration of the estuary would not be completed. No removal of soil or vegetation would occur to restore or establish habitat

or channel improvements and therefore, would not require energy use for construction activities. **Thus, implementation of the No Project/No Action Alternative would not use energy in a wasteful, inefficient, or unnecessary manner and no impact pursuant to CEQA (CEQA Criterion A) would occur. The No Project/No Action Alternative would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency; therefore, no impacts per CEQA (CEQA Criterion B) would occur. No energy-related impacts considered significant under NEPA have been identified.**

4.18.3.2 Soil Management

Similar to energy use required for restoration and enhancement activities, soil management also requires the temporary consumptive use of energy required to operate machinery during construction. As described above, energy saving project design features and standard construction procedures outlined in Table 3-8 and Table 3-9 would aid in avoiding wasteful and inefficient use of energy resources. Additionally, on-site and nearby off-site sites have been identified (i.e., reuse within the restoration area, disposal at the beach/nearshore and Nelson Sloan Quarry) to minimize energy consumption during soil management activities. Once completed, soil management would not generate additional substantial daily vehicle trips, necessitate an increased need for ongoing energy use, or require other energy-consuming activities. Soil management would not conflict with plans for renewable energy. **Thus, soil management activities would not use energy in a wasteful, inefficient, or unnecessary manner, and, therefore, less than significant impact to energy resources pursuant to CEQA (CEQA Criterion A) would occur. Soil management would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and no impacts would occur pursuant to CEQA (CEQA Criterion B). No significant impacts to energy resources as a result of soil management would occur pursuant to NEPA.**

4.18.4 Avoidance, Minimization, and Mitigation Measures

The proposed project would not result in energy impacts that are significant under CEQA or NEPA; therefore, no mitigation measures are required.

CHAPTER 5.0
CUMULATIVE ANALYSIS

CEQA and NEPA require preparation of a cumulative impact analysis. Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these effects, and resulting environmental degradation, that should be the focus of cumulative impact analysis. This chapter analyzes how the proposed TETRP II Phase I may affect the environmental conditions within and beyond the Plan Area.

5.1 REGULATORY REQUIREMENTS

CEQA Guidelines require a discussion of cumulative impacts of a project "when the project's incremental effect is cumulatively considerable." (2011 CEQA Guidelines, Section 15130). As defined by Section 15065 (a)(3) "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (2011 CEQA Guidelines, Section 15065 (a)(3). These cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355).

The discussion of cumulative impacts is further guided by CEQA Guidelines Section 15130(a) and (b), which states the following:

- An EIR shall not discuss impacts which do not result in part from the project evaluated in the EIR.
- When the cumulative effect of the project's incremental contribution and the effect of the other projects is not significant, the EIR shall briefly indicate why and not discuss it further.
- An EIR may identify a significant cumulative effect, but determine that a project's contribution is less than significant. That conclusion could result if the project is required to implement or fund its fair share of a mitigation measure designed to alleviate the cumulative impact.
- The discussion of cumulative impacts shall reflect the possibility of occurrence and severity of the impacts and focus on cumulative impact to which the identified other projects could contribute.

Federal regulations implementing NEPA have recently been amended to include a revised definition of effects, which includes direct, indirect, and cumulative effects. The final rule, effective May 20, 2022 (87 FR 23453), states: "Cumulative effects, which are effects on the environment that result

from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR § 1508.1(g)(3). In general, effects of a particular action or a group of actions would be considered cumulative impacts under the following conditions:

- effects of several actions in a common location,
- effects are not localized (i.e., can contribute to effects of an action in a different location),
- effects on a particular resource are similar in nature (i.e., they affect the same specific element of a resource), and
- effects are long term (short-term impacts tend to dissipate over time and cease to contribute to cumulative impacts).

5.2 METHODOLOGY

Section 15130(b)(1) of the CEQA Guidelines allows for the use of two alternative methods to determine the scope of projects for the cumulative analysis:

List Method – A list of past, present, and probable future projects producing related or cumulative impacts, including those projects outside the control of the agency (if necessary).

Projection Method – 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. This serves as a basis for the analysis of the cumulative impacts.

Pursuant to Section 15130(d), cumulative impact discussions may rely on previously approved land use documents such as general plans, specific plans, and local coastal plans and may be incorporated by reference. Also, no further cumulative impact analysis is required when a project is consistent with such plans, where the lead agency determines that the regional or area-wide cumulative impacts of the proposed project have already been adequately addressed in a certified EIR for that plan.

This analysis relies on a combination of both the list and projection methods as appropriate. The projection method using regional planning is considered for a regional approach for topics that can have far reaching impact areas, such as air quality or water quality. The list approach is considered for topics with much more limited areas of impact in areas near the project site, such as noise or geology.

Per the list approach, Table 5.3-1 identifies known projects in the vicinity of the project site that may have the potential to combine with the effects of the proposed project and result in a cumulative

impact. This list primarily includes planned projects that are on file with local jurisdictions or agencies. Relevant, known projects that have not yet begun the planning process may also be included in this list for the purposes of disclosure, although adequate information may not be available at this time to determine their potential cumulative contribution. Additionally, recently completed projects are also included on the list for informational purposes, even though the environmental effects of a previously completed project would be considered in existing conditions and included in the overall baseline.

5.3 GEOGRAPHIC SCOPE

The cumulative projects considered in the following analysis are listed in Table 5.3-1. Most of the projects are located along the San Diego County's central coastlines; however, key infrastructure projects are slightly inland and parallel to the coast. If the geographic scope is expanded or narrowed for a specific topic area, it is described in the appropriate section.

Table 5.3-1
Cumulative Projects List

Project Name	General Location/Jurisdiction	Project Type	Description	Project Status/Schedule
Nelson Sloan Quarry Restoration and Benefical Reuse of Sediment Project	Tijuana River Valley Regional Park/County of San Diego	Restoration	The project consists of the beneficial reuse of excess sediment excavated from flood control facilities and disturbed habitats in the Tijuana River Valley towards the restoration of the Nelson Sloan Quarry. Up to approximately 1,000,000 cubic yards of excess sediment would be hauled to the project site over an approximate 10- to 15-year period to restore landform and provide habitat restoration in the abaondoned quarry. Deposited sediment would be processed at an on-site processing pad/stockpile staging area.	Draft EIR circulated for review September 2021
Border Field State Park Interpretation, Resilience and Access Improvements Project	Monument Road, Monument Mesa, and adjacent areas in Border Field State Park	State Parks Project	Develop interpretive facilities, restore wetland habitat, and repair Monument Road.	Preliminary Planning Phase. CEQA compliance tentatively scheduled for late 2021
CSP Goat Canyon Sediment Management	Monument Road (nearest western terminus)	Sediment Management	Ongoing sediment management.	Ongoing

Project Name	General Location/Jurisdiction	Project Type	Description	Project Status/Schedule
CDPR Goat Canyon Enhancement Project	Monument Road (nearest western terminus)	Sediment Management	Construct sediment retention basins adjacent to the Goat Canyon drainage to reduce sediment flows to the southern arm of Tijuana Estuary, and restore riparian habitat in the project vicinity.	Completed 2000
Border Wall Construction and Maintnenance (CBP)	Tijuana River Channel from United States/Mexico border to approximately Pacific Ocean	International border barrier	Pedestrian barrier, linear ground detection system, installation of gates, access road construction and refurbishment, installation of lighting, drainage.	Ongoing
Smuggler's Gulch Trash and Sediment Basin	Smuggler's Gulch in Tijuana River Valley Regional Park	Trash and Sediment Management	Construct a sedimentation basin(s) within Smuggler's Gulch.	In environmental review; would be designed/ built in late 2021/2022
City of San Diego Smuggler's Gulch and Pilot Channel Sediment Management – component of the Municipal Waterways Maintenance Program	Tijuana River Valley	Sediment Management	Period maintnenace of both channels to restore the channel's flood conveyance capacity to their original design condition and to protect the Tijuana River National Esturarine Research Reserve. The project incorporated removal of approximately 10,000-30,000 cubic yards of material, occupying a total of 4.31 acres.	Ongoing
USMCA Mitigation of Contaminated Transboundary Flows Project	Projects along the United States/Mexico Border	Wastewater Treatment Solutions	The USMCA Project involves the planning, design, and construction of infrastructure to reduce transboundary flows of untreated wastewater (sewage), trash, and sediment that routinely enter the United States from Mexico via the Tijuana River, its tributaries, and across the maritime boundary along the San Diego County coast (EPA 2021c).	Notice of Intent (NOI), April 2021; Public Scoping Meeting April 2021; Draft Programmatic EIS June 2022; Final Programmatic EIS November 2022

Project Name	General Location/Jurisdiction	Project Type	Description	Project Status/Schedule
Long-term Sediment Management Activities	Tijuana River Valley	Sediment Management	The Tijuana Estuary sediment management planning effort, facilitated by the City of Imperial Beach, is developing a sediment management plan intended to serve as a guidance document for a programmtic approach to sustainable, long-term and cost-effective sediment management in the Tijuana River Valley. The purpose of this effort is to develop environmentally sustainable and cost-efficient processes to capture, handle, and beneficially resuse Valley sediment and support project planning and/or capital project dvelopment acitivites in the Tijuana River Watershed.	Ongoing
Tijuana River Border Wall System Project (CBP)	Projects along the United States/Mexico Border	Federal Project	CBP is constructing new border wall system across the Tijuana River in western San Diego County, California.	Construction activities are puased and all border wall projects are currently undergoing review
Model Marsh and Fenton Quarry Restoration	Model Marsh is northwest of Goat Canyon in Border Field State Park; Fenton Quarry is adjacent to Goat Canyone= in Tijuana River Valley Regional Park	Restoration	Restore 20 acres of salt marsh habitat (i.e., Model Marsh) and use excavated sediment to restore landform and coastal sage scrub habitat at the Fenton Quarry.	Complete 2001
San Diego Secondary Wall (CBP)	Parallel to international boundary adjacent to Ciry of Tijuana	Federal Project	Replacement and construction of secondary bollard wall in the CBP San Diego Sector. Includes removal of secondary fence and construction of approximately 1.6 miles of new 30-foot steel bollard wall.	Constructed 2018-2020
Tijuana River Vegetation Control (CBP)	Tijuana River channel from United States/Mexico border to approximately Dairy Mart Road	Vegetation Control	Preserve line-of-sight for CBP agents and reduce hiding opportunities within the Tijuana River Floodway (TRF) by controlling vegetation in the TRF.	Draft Environmenal Assessment and Finding of No Significant Impact prepared in July 2017

Project Name	General Location/Jurisdiction	Project Type	Description	Project Status/Schedule
County of San Diego Tijuana River Valley Regional Park Campground and Nature Education Center	Directly west of Saturn Boulevard and north of Monument Road, 1.3 miles east of the Pacific Ocean	County Recreation Project	Construct 79-acre campground and outdoor nature education center. Campground includes up to 75 primitive campsites.	Mitigated Negative Declaration approved in 2018, campground construction completed in March 2020
City of San Diego Capital Improvement Project (CIP): AC Water and Sewer Group 1040	Monument Road: Dairy Mart Road west for approcimately 6,000 feet. Hollister Street: Monument Road north to Tijuana River crossing.	Landform Restoration Project	Replacement of water mains with new PVC water mains.	In engineering; final design anticipated in 2021

5.4 CUMULATIVE IMPACT ANALYSIS

To provide a conservative analysis that accurately reflects the full extent of cumulative effects, impacts from TETRP II Phase I were considered for potential contributions to cumulative impacts. Differences between Alternative 1 and the proposed project in terms of contribution to cumulative impacts are called out when applicable; otherwise, the impacts are assumed the same across both designs.

As noted in the table above, the Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project circulated a Draft EIR for public review in September 2021. While completely separate projects, the Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project anticipates the potential of material transport from TETRP II Phase I and, similarly, TETRP II Phase I includes options for material transport to the quarry as a potential disposal method. Each project has evaluated these options independently in their environmental documents. The Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project includes analysis focusing on material being transported to the Nelson Sloan Quarry as compared to TETRP II Phase I where the focus is on materials being transported away from the project site. At the time of document preparation for the Nelson Sloan Quarry improvements, general assumptions were made based on potential source materials. TETRP II Phase I considers multiple options to cover potential material transport scenarios, including beach nourishment and off-site disposal at a landfill or other approved project, and describes more detailed assumptions based on refined design information (e.g., excavation quantities, transport volumes). Both the Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project and TETRP II Phase I are in early planning stages and included assumptions with information available at the time of document preparation and thus have different trip generation numbers and other differences.

5.4.1 Land Use

Section 4.1 identifies no significant land use impacts as a result of activities associated with estuary restoration or soil management for either alternative as the majority of the project study area would generally maintain its current land use; would not create incompatible land uses; and would not be inconsistent with regulatory policies. The continuation of the project area as open space would not be substantially altered by TETRP II Phase I or cause surrounding land uses to change. Other cumulative projects, such as infrastructure improvements of Monument Road, are not generally of the nature to result in substantial land use conflicts or incompatibilities and would improve or upgrade existing infrastructure as opposed to creating new uses or substantially modified alignments. Other projects on the list involve restoration and wastewater treatment that would also not substantially modify the land use of an area or create a new incompatible use. **For these reasons, TETRP II Phase I would not make a cumulatively considerable contribution to a direct or indirect adverse significant cumulative impact related to land use. A less than significant impact would occur pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.**

5.4.2 Recreation and Public Access

No significant impacts to recreation opportunities or facilities were identified in association with TETRP II Phase I. While TETRP II Phase I requires the loss of Marsh Trail, this is not considered substantial as there are many miles of trails that would remain available, and the 0.5-mile-long Marsh Trail does not serve as a connector or other important element of the trail network. TETRP II Phase I would not modify or affect the recently completed CSP trail improvements around the Visitor Center for compliance with Americans with Disabilities Act. Additionally, Marsh Trail does not provide beach or shoreline access. While temporary closures of other trails in the immediate vicinity of the project may be required for safety purposes during construction or maintenance activities, similar recreational trail opportunities would continue to be available in areas to the east and south of the restoration site during construction.

The existing testing program to identify potential water quality exceedances may require short-term closure of water-based recreational activities along the beach; however, such closures would be temporary and would not result in a substantial loss of recreational use as similar beach use is available in surrounding areas. Other cumulative projects, including the Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project, would also not cause impacts to recreation opportunities, as these projects would not result in permanent access restrictions, and are expected to improve recreational access for downstream communities. **For these reasons, the elimination of Marsh Trail and the potential for temporary trail closures in the immediate vicinity of the project during construction of the TETRP II Phase I Project would not make a cumulatively considerable contribution to a direct or indirect adverse significant cumulative impact**

related to recreation and public access. A less than significant impact would result pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.

5.4.3 Hydrology and Water Quality

No significant impacts to hydrology were identified in association with TETRP II Phase I. TETRP II Phase I would change some of the estuary's hydrology and drainage patterns; however, the design-induced changes would cause a net beneficial impact to the hydrology by improving hydraulic efficiency, tidal prism, improved drainage pathways to the ocean, and overall circulation. It is possible that other cumulative projects, specifically projects that require substantial earth-moving or surface alterations, or projects that increase impervious surface area, could also change and modify local hydrology. However, implementation of BMPs to minimize impacts on surface drainage patterns, the amount of surface runoff, and the exposure of people or property to water-related hazards such as flooding would likely be required. Adherence to federal, state, and local regulations and requirements (e.g., preparation of a SWPPP), including the implementation of BMPs, would further aid in minimizing the potential for project impacts that could combine to create cumulative hydrology impacts.

Restoration and enhancement activities associated with implementation of TETRP II Phase I would not create significant impacts to water quality because a variety of appropriate BMPs would be implemented to protect water quality, minimize erosion, and minimize soil transport during construction. TETRP II Phase I would improve long-term water quality throughout the estuary by increasing the tidal prism, which would improve circulation and the conveyance of flows and sediment through the estuary to the river mouth.

Soil management may result in temporary and localized increases in turbidity and suspended sediment concentrations, thereby contributing to the potential of exceedances of water quality standards identified in the Ocean Plan. Temporary and localized turbidity plumes associated with beach placement under TETRP II Phase I could overlap with other areas of turbidity caused by cumulative sand nourishment projects, in combination with large turbidity plumes that accompany river flows during storm events currently. Additionally, temporary and localized increases in bacteria may occur and would contribute incrementally to the existing water quality impairment along the beach. While it is unlikely that cumulative sand nourishment projects would be ongoing in the immediate vicinity at the same time as TETRP II Phase I, soil management in combination with other cumulative sand nourishment projects would potentially generate or release pollutants that are in violation of applicable federal or state standards.

Water quality impacts can have widespread effects to an entire watershed, hydrologic unit, and downstream locations. For this reason, analysis of potential cumulative impacts to water quality must also consider development and projects that are occurring at upstream locations in the

watershed. Many of the projects on the cumulative project list, such as long-term sediment management activities, would not be of the type or magnitude to create substantial, permanent water quality impacts. Some projects, such as the USMCA Mitigation of Contaminated Transboundary Flows Project, would make substantial improvements to existing infrastructure and wastewater facilities to minimize the potential sewage, trash, and sediment inputs that affect the estuary's water quality. Other sediment basin projects located upstream of the estuary would minimize the high volumes of sediment that travel downstream and into the estuary, particularly within the southern arm. As described in Section 4.3, multiple federal, state, and local regulations must be complied with to protect water quality. Typically, projects under the Construction General Permit would be required to prepare a SWPPP that identifies BMPs that would be used to prevent pollutant discharge and minimize other water quality impacts. Additionally, projects would be implemented in accordance with RWQCB water quality certifications, which require compliance with applicable water quality standards, limitations, and restrictions. The required adherence to water quality regulations and implementation of required BMPs would minimize the potential for water quality impacts to result from cumulative projects and development throughout the watershed.

For these reasons, restoration and enhancement activities associated with implementation of TETRP II Phase I would not make a cumulatively considerable contribution to a direct or indirect adverse impact related to hydrology or water quality. A less than significant cumulative impact would result pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.

Soil management would not result in a cumulatively considerable contribution to impacts related to hydrology. Therefore, a less than significant cumulative impact would result. Soil management would potentially generate or release pollutants that are in violation of applicable federal or state standards, and a significant and temporary cumulative impact related to water quality would result pursuant to CEQA and NEPA.

5.4.4 Coastal Processes

Section 4.4 identified no significant impact related to coastal processes. Beach nourishment on neighboring beaches is not currently planned, and has historically been focused on Imperial Beach north of the project site. Therefore, larger regional impacts are not anticipated. TETRP II Phase I would allow for continued as-needed removal of sand at the mouth of the Tijuana River similar to existing conditions. Additionally, periodic excavation at the river mouth is undertaken to bypass sand that has been temporarily removed from the littoral cell and trapped in the river mouth and can be considered a cyclic redistribution of sand within the littoral cell rather than new littoral sand. As such, it is not anticipated to result in adverse effects to littoral and coastal processes. **Therefore, TETRP II Phase I would not make a cumulatively considerable contribution to a**

cumulative direct or indirect adverse impact to coastal processes. A less than significant impact would occur pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.

5.4.5 Hazardous Materials and Public Safety

Other cumulative projects, such as the Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project, USMCA Mitigation of Contaminated Transboundary Flows Project, and Monument Road Improvements Project, may also occur within the area in an overlapping timeframe with TETRP II Phase I and would also be required to comply with regulatory safety requirements regarding hazardous materials. As described in Section 4.5, TETRP II Phase I would not create increased public safety risks or hazardous material conditions for restoration and enhancement activities. The mandatory adherence to regulatory requirements limits potential for cumulative risks associated with the use of hazardous materials. Development of cumulative projects would be subject to regulatory requirements specific to the safe handling and transport of hazardous materials, thus minimizing potential for increased public safety hazards. In general, the cumulative projects including restoration of a quarry and improvement of pollution in water flows help to improve environmental conditions that could adversely affect human health and safety.

Soil management efforts may result in water quality violations, and may result in a public health hazard from exposure to elevated levels of bacteria within portions of the open beach used by recreationalists. In combination with other cumulative projects, which are not anticipated to overlap with TETRP II Phase I but could be implemented at the same time, potential water quality violations would result; thus, creating elevated levels of bacteria

For these reasons, restoration and enhancement associated with implementation of TETRP II Phase I would not make a cumulatively considerable contribution to a direct or indirect cumulative public hazard impact. A less than significant impact would occur pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.

5.4.6 Biological Resources

It is anticipated that some of the cumulative projects could also include construction located within or in proximity to the river valley itself and have the potential to adversely impact sensitive biological resources. These impacts could include the disturbance of sensitive vegetation communities, habitat loss, impacts to nesting and/or foraging habitat of sensitive animal species, temporary restrictions to wildlife movement, degraded water quality, and others. These projects would be subject to federal, state, and local regulations aimed at the avoidance, protection, and mitigation of adverse impacts to biological resources although biological impacts could still occur.

As described in Section 4.6, similar temporary biological impacts would occur during the active construction of TETRP II Phase I as noise associated with construction could impact sensitive species if construction occurs during the breeding season. The lands included within TRNERR include suitable habitat for sensitive species, particularly within the northern arm of the estuary. Species have the ability to move throughout the river valley corridor to find adequate areas of habitat if certain locations are disturbed by construction activities, including by indirect effects such as noise. Additionally, other cumulative projects may include seasonal restrictions that would serve to minimize the potential for overlapping construction influences that could affect sensitive wildlife species.

Implementation of TETRP II Phase I would further enhance estuarine habitats by expanding suitable habitat for a number of listed and special-status species. While some adverse short-term biological impacts could occur if construction overlaps with that of TETRP II Phase I, they would not be considered significant because the cumulative contribution of TETRP II Phase I would cease over time as habitats establish. In addition, TETRP II Phase I would not result in a considerable contribution to long-term cumulative impacts because of the overall positive and beneficial biological results that would occur from the implementation of TETRP II Phase I. **Thus, TETRP II Phase I would not make a cumulatively considerable contribution to a cumulatively significant impact related to biological resources. A less than significant impact would result pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.**

5.4.7 Geology/Soils

Section 4.7 identified no significant impacts related to geologic hazards. Geologic hazards tend to be very localized and limited to the area in immediate proximity to the area of disturbance. It is possible that TETRP II Phase I restoration could be under construction concurrent with other cumulative projects. Planned infrastructure projects within the local area, including the Monument Road Improvement Project, would be subject to multiple regulatory codes and requirements to verify proper design and engineering to achieve applicable safety standards when being constructed in unstable geologic conditions. For these reasons, the activities associated with estuary restoration and soil management under each of the alternatives would not increase geologic hazards. The removal of soil and earthwork on the project site, mainly in the flat estuary bottoms and local channels would not be of the nature or magnitude to cause unstable geologic conditions that could combine with other local projects to create geologic hazards. **Thus, TETRP II Phase I would not make a cumulatively considerable contribution to a cumulatively significant adverse impact related to geology and soils. A less than significant cumulative impact would result pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.**

5.4.8 Cultural Resources

As discussed in Section 4.8, construction of TETRP II Phase I would have the potential to result in significant impacts to archaeological resources and human remains. Other cumulative projects and future development within the local area and region have the potential to result in similar significant impacts to these resources. Similar to TETRP II Phase I, cumulative projects would also be subject to federal, state, and local regulations mandating the protection of cultural resources. Avoidance, minimization, and mitigation measures for such impacts would likely be similar to that prescribed for TETRP II Phase I and would include Native American consultation, resource documentation and evaluation, and test and/or data recovery excavations if necessary. These types of mitigation measures would avoid significant adverse effects and allow cultural resources data to be protected and preserved so that the critical information necessary to the future study of cultural resource sites and artifacts is not lost or destroyed by TETRP II Phase I or other cumulative projects within the study area. Other cumulative impacts to archaeological resources would be expected to be fully avoided, minimized, or mitigated, and critical information regarding regional prehistory preserved and/or documented. **Thus, TETRP II Phase I would not make a cumulatively considerable contribution to a significant cumulative impact related to cultural resources. A less than significant cumulative impact would result pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.**

5.4.9 Tribal Cultural Resources

As described in Section 4.9, implementation of restoration and enhancement efforts would have the potential to result in substantial adverse effects to Tribal cultural resources. Other cumulative projects within the vicinity of TRNERR and the region have the potential to also result in similar significant impacts to these resources. Like TETRP II Phase I, cumulative projects would also be subject to regulations and requirements mandating the protection of Tribal cultural resources. Avoidance, minimization, and mitigation measures for such impacts would likely be similar to that prescribed for TETRP II Phase I, including Native American consultation. These similar mitigation measures would allow Tribal cultural resources to be protected and preserved so that these resources are not lost or destroyed by TETRP II Phase I or other cumulative projects within the study area. Other cumulative impacts to Tribal cultural resources would be expected to be fully avoided, minimized, or mitigated, and critical information regarding regional prehistory preserved and/or documented. **Thus, TETRP II Phase I would not make a cumulatively considerable contribution to a significant cumulative impact related to Tribal cultural resources. A less than significant cumulative impact would result pursuant to CEQA.**

5.4.10 Paleontological Resources

Section 4.10 identified no significant impacts to paleontological resources due to the low sensitivity of alluvial and beach deposits and the unlikelihood of finding resources in these recent deposits. Other cumulative projects would also require verification that paleontological resources encountered during construction would be adequately treated and the important information retained and documented in compliance with CEQA. This would minimize/mitigate the potential for TETRP II Phase I to add to the cumulative loss or destruction of significant paleontological resources. **TETRP II Phase I would not make a cumulatively considerable contribution to a cumulatively significant direct or indirect adverse impact related to paleontology. A less than significant impact would result pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.**

5.4.11 Visual Resources

Section 4.11 identified that the visual environment of the project site would be altered due to construction activities, but the temporary alteration would not be a significant impact. When analyzing cumulative visual impacts, it is important to consider those projects that could alter the existing visual environment with the same viewshed as TETRP II Phase I. Other cumulative projects such as the USMCA Mitigation of Contaminated Transboundary Flows Project, the Nelson Sloan Quarry Restoration and Beneficial Reuse of Sediment Project, and the Monument Road Improvement Project, could contribute to the short-term temporary construction visual affects by adding more construction equipment in the general area, increasing vegetation removal, landform modifications, stockpiling, and other construction related activities. However, due to the limited visibility of the project site and limited nature of construction within the project and beach nourishment sites and because the visual intrusion of construction activities would last only for the duration of each project's construction period and, ultimately, the project site character would be returned similar to existing pre-construction conditions, the visual effects from various construction projects are considered noticeable and somewhat out of context, but would not be substantial. Once restored, the project site would continue to provide a natural and open setting, similar to the current aesthetic and would not create a noticeable change in the viewshed. **Thus, TETRP II Phase I would not make a cumulatively considerable contribution to a significant cumulative visual impact due to the cumulative construction projects throughout the project site and beach nourishment site. A less than significant impact would result pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.**

5.4.12 Transportation

Section 4.12 identified no significant transportation impacts as a result of the implementation of TETRP II Phase I. As noted in the transportation analysis, if disruption of traffic is anticipated

(e.g., lane closure, detour, or similar actions) during construction activities, a Traffic Control Plan will be implemented. Transportation impacts are not anticipated with maintenance activities as a minimal number of trips would be associated with post-implementation activities. It is possible that other cumulative projects, including roadway repairs, could be ongoing in the area that would also require the use or disruption of local roadways. If construction periods of cumulative projects were to overlap, traffic volumes on local roadways could increase; however, the Traffic Control Plan will address the coordination with other projects to provide adequate transportation conditions are planned for the construction period. The Traffic Control Plan may include measures as necessary to minimize traffic congestion such as the use of flaggers, specified timing, or other requirements determined to be needed to maintain appropriate level of operation on the affected roadways. The Traffic Control Plan will also address the pedestrians and their ability to safely traverse the construction zone. Since construction-related traffic effects would be short term and periodic, **TETRP II Phase I would not make a cumulatively considerable contribution to a significant cumulative impact related to transportation. A less than significant impact would result pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.**

5.4.13 Air Quality

The geographic scope for the cumulative analysis of air quality impacts is considered to be the SDAB. It is appropriate to consider the entire air basin because air emissions can travel substantial distances and are not confined by jurisdictional boundaries; rather, they are influenced by large-scale climatic and topographical features. Although some air quality emissions can be localized, such as a TAC impacts or odor, the overall consideration of cumulative air quality is typically more regional. By its very nature, air pollution is largely a cumulative impact. The analysis in Section 4.13 concluded that temporary construction-related emissions would exceed the recommended level of significance for PM_{10} emissions, and construction activities could lead to a violation of an applicable air quality standard. Implementation of mitigation measures would partially reduce anticipated emissions, but potentially not to levels below the applicable CEQA thresholds. Proposed mitigation would reduce emissions but may not fully mitigate the impact, and it would remain significant pursuant to CEQA. Construction and operation of cumulative projects and general growth and development throughout the region would further degrade the air quality of the SDAB. Air quality would be temporarily degraded during construction activities that occur separately or simultaneously. The required adherence to air quality regulations and implementation of mitigation would reduce the potential for significant adverse cumulative air quality impacts to occur throughout the SDAB due to cumulative projects. As discussed in Section 4.13, pursuant to NEPA, TETRP II Phase I would not exceed the de minimis levels and would be exempt from the General Conformity Rule. Since the de minimis levels consider the existing air quality of the air basin, and conformity is both a project-level and a regional planning issue,

projects that would conform to the SIP and not require a formal conformity analysis, would also not contribute to a significant cumulative effect pursuant to NEPA.

A project that produces a significant air quality impact in an area that is out of attainment is considered to significantly contribute to the cumulative air quality impact. Since details are not available at this time to determine with certainty that mitigation would fully reduce emissions from TETRP II Phase I to below a level of significance, **TETRP II Phase I would potentially make a considerable temporary contribution to a significant cumulative impact related to air quality. A significant impact could occur pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.**

5.4.14 Greenhouse Gas Emissions

A single project is unlikely to have a significant impact on global climate change. However, the cumulative effects of worldwide GHG emissions have been clearly linked to changes in the atmosphere and identified as the main cause of global climate change. For this reason, analysis of GHG emissions from TETRP II Phase I, as provided in Section 4.14, is considered a cumulative impact analysis. Section 4.14 provides a complete analysis of GHG emissions for TETRP II Phase I. The GHG emissions associated with the restoration and soil management activities would not exceed the significance thresholds, including the most conservative annual threshold of 900 MT CO_2e. **Therefore, TETRP II Phase I would not generate GHG emissions that may have a significant impact on the environment and would not make a cumulatively considerable contribution to a cumulative GHG impact. A less than significant impact would occur pursuant to CEQA, and no significant cumulative effects would occur pursuant to NEPA.**

5.4.15 Noise

Noise is a localized issue and potential impacts extend only as far as noise from a project is audible. For this reason, cumulative impacts would only result when two projects are in proximity and occurring concurrently. As detailed in Section 4.15, the noise analysis did not identify significant impacts as a result of TETRP II Phase I implementation.

It is possible that another cumulative project could occur during the same timeframe as construction of TETRP II Phase I. Other cumulative projects are anticipated to occur within the general area at some point during enhancement activities, and it is possible that multiple projects would have overlapping haul routes in proximity to a residential area such that their noise could combine and result in an exceedance of noise level thresholds. While the cumulative noise increase along haul routes would be temporary and only occur if multiple construction projects were using the same haul routes, there is a potential that the cumulative noise levels could be above significant levels at nearby receptors. **Thus, in certain circumstances, TETRP II Phase I would make a**

cumulatively temporary considerable contribution to a significant noise impact. A significant cumulative noise impact would occur pursuant to CEQA and NEPA.

5.4.16 Socioeconomics/Environmental Justice

As noted in Section 4.16, the overall social and economic effects of TETRP II Phase I would be beneficial. The estuary represents a valuable coastal salt marsh habitat with substantial biological and ecological resources, and its restoration and enhancement does not cause issues of concern related to environmental justice. The potential reuse of material would result in beaches with wider and larger sand areas that provide greater recreational opportunities and enhanced tourism in the region. Other cumulative projects, such as improvements at Monument Road, would result in improved facilities and opportunities available to minority or low-income populations within the immediate vicinity as well as the general public. While short-term and localized, impacts to recreational activities, such as restricted use of trails, would occur to users of TRNERR.

The increased traffic, noise, and air pollutants resulting from truck trips associated with off-site disposal of material could combine with other cumulative projects in the area if concurrently using the same roadways for construction activities. As discussed in previous sections of this document, the use of heavy trucks along the haul routes have the potential to create temporary negative effects, such as increased noise, air emissions, and traffic for the minority populations in immediate proximity of the roadways. These effects, if prolonged or permanent, would have the potential to be cumulatively significant; however, the impacts would be temporary, lasting only the duration of the material disposal activities that require off-site material transport. While considered short-term nuisances to environmental justice populations along the haul route, the cumulative effects would not be of the magnitude or longevity that would disproportionately subject a minority or low-income population group to adverse environmental and socioeconomic impacts.

Therefore, implementation of TETRP II Phase I would not contribute to a cumulative direct or indirect impact to socioeconomics or environmental justice. A less than significant impact would occur pursuant to CEQA, and no significant impact would occur pursuant to NEPA. No disproportionate impacts to minority or low-income communities would result pursuant to CEQA or NEPA.

5.4.17 Public Services and Utilities

TETRP II Phase I would not result in significant impacts to public services and utilities under each alternative. Minimal amounts of utility provision or other public services would be required for TETRP II Phase I. TETRP II Phase I has been designed to avoid interference with existing utilities. Generally, the listed cumulative projects would not result in new construction with substantial increase in demand for utilities or public services. Some cumulative projects would serve to

improve or replace old or failing utility infrastructure such as the USMCA Mitigation of Contaminated Transboundary Flows Project and the Monument Road Improvements Project. **Since TETRP II Phase I would not result in the need for new systems or substantial alterations to existing systems that would have environmental impacts, TETRP II Phase I would not make a cumulatively considerable contribution to a cumulative direct or indirect adverse impact to utilities or public services. A less than significant impact would occur pursuant to CEQA, and no significant effect would occur pursuant to NEPA.**

5.4.18 Energy

Section 4.18 identified no significant energy impacts as a result of the activities associated with the estuary restoration or soil management for each alternative. TETRP II Phase I would be subject to project design features and standard construction procedures that would minimize significant environmental impacts due to wasteful use of energy. The energy used for TETRP II Phase I would not be considered wasteful, inefficient, or unnecessary. **Therefore, regardless of other projects' cumulative contributions to energy use, TETRP II Phase I would not result in a cumulatively considerable direct or indirect impact. A less than significant impact would result pursuant to CEQA, and no significant effect would occur pursuant to NEPA.**

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CHAPTER 6.0
COMPARISON OF ALTERNATIVES

6.1 COMPARISON OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

This chapter compares the alternatives described in Chapter 3 and evaluated in Sections 4.1 through 4.18. Both CEQA and NEPA require analysis of a reasonable range of alternatives. Accordingly, the DEIR/EIS analyzed alternatives that feasibly meet the objectives of the proposed project, along with the No Project Alternative (CEQA) and the No Federal Action Alternative (NEPA). Each alternative is analyzed in an equal level of detail. This level of analysis is included to provide sufficient information and meaningful detail about the environmental effects of each alternative so that informed decision-making can occur.

As described in Chapter 2, the proposed project has two components: (1) restoration and enhancement of Tijuana Estuary and (2) soil management of excavated materials from the estuary. These project components were analyzed independently from one another throughout the DEIR/EIS, where appropriate. The estuary restoration and enhancement alternatives include:

- Alternative 1
- Proposed Project

The soil management scenarios are described in Chapter 3. They include options for beach nourishment either on-site in the beach and swash zone or off-site and are dependent on the volume and quality of material.

Other alternatives that were considered but eliminated during the alternatives screening process are summarized in Tables 3-1 and 3-2.

6.2 EVALUATION OF ALTERNATIVES

CEQA

The CEQA Guidelines (14 CCR Section 15126.6) require that an EIR present a range of reasonable alternatives to the project, or to the location of the project, that would feasibly attain most of the basic project objectives, but would avoid or substantially lessen significant effects of the project. Section 15126.6 of the CEQA guidelines also requires an evaluation of the comparative merits of the alternatives. An EIR is not required to consider alternatives that are infeasible. Table 6-1 summarizes the results of the CEQA impact analysis for each resource area.

Table 6-1
CEQA Significance Conclusions

Environmental Resource Area	Alternative 1	Proposed Project	No Project/No Federal Action	Soil Management
Land Use	L	L	L	L
Recreation and Public Access	L	L	N	L
Hydrology and Water Quality	L	L	L	S
Coastal Processes	–	–	–	L
Hazardous Materials and Public Safety	L	L	N	M
Biological Resources	S	S	N	S
Geology/Soils	L	L	N	L
Cultural Resources	M	M	N	N
Tribal Cultural Resources	M	M	N	L
Paleontological Resources	L	L	N	L
Visual Resources	L	L	N	L
Transportation	L	L	N	L
Air Quality	S	S	N	S
Greenhouse Gas Emissions	L	L	N	L
Noise	L	L	N	L
Socioeconomics/Environmental Justice	–	–	–	–
Public Services and Utilities	L	L	N	L
Energy	L	L	N	N

S = Significant unavoidable impact
M = Significant but mitigated to less than significant impact
L = Less than significant impact
N = No impact
– = Not Applicable

NEPA

NEPA (40 CFR § 1502.14[a]) requires that an EIS explore and evaluate a range of reasonable alternatives to the project. The CWA Section 404(b)(1) regulations (40 CFR § 230) also address alternatives, stating that no discharge of dredged or fill material will be permitted if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, so long as that alternative does not have other significant adverse environmental consequences. Chapter 3 of this FEIR/EIS sets forth potential alternatives to the recommended plan, and Sections 4.1 through 4.18 evaluate their environmental impacts. Table 6-2 summarizes potential effects identified per NEPA for each resource area.

Table 6-2
NEPA Conclusions

Environmental Resource Area	Alternative 1	Proposed Project	No Project/No Federal Action	Soil Management
Land Use	N	N	N	N
Recreation and Public Access	N	N	N	N
Hydrology and Water Quality	N	N	N	S
Coastal Processes	–	–	–	N
Hazardous Materials and Public Safety	N	N	N	N
Biological Resources	S	S	N	S
Geology/Soils	N	N	N	N
Cultural Resources	N	N	N	N
Tribal Cultural Resources	-	-	-	-
Paleontological Resources	N	N	N	N
Visual Resources	N	N	N	N
Transportation	N	N	N	N
Air Quality	N	N	N	N
Greenhouse Gas Emissions	N	N	N	N
Noise	N	N	N	N
Socioeconomics/Environmental Justice	N	N	N	N
Public Services and Utilities	N	N	N	N
Energy	N	N	N	N

S = Significant effect
N = No significant effect
– = not applicable

6.3 ANALYSIS OF IMPACTS OF ALTERNATIVE 1 AND THE PROPOSED PROJECT

Overall, less than significant impacts under CEQA for Alternative 1 and the proposed project include Land Use, Recreation and Public Access, Coastal Processes, Geology/Soils, Paleontological Resources, Visual Resources, Transportation, Greenhouse Gas Emissions, Socioeconomics/ Environmental Justice, Public Services and Utilities, Noise, and Energy. Potentially significant impacts under CEQA requiring mitigation that would be reduced to less than significant include Cultural Resources, Tribal Cultural Resources, and Hazardous Materials and Public Safety. Significant and unavoidable impacts identified under CEQA include those for which no feasible mitigation is available to reduce the project's impacts to a less than significant level, and include Biological Resources, Air Quality, and Water Quality (within Hydrology and Water Quality analysis) as detailed in Section 6.3.1 below. Significant impacts identified under NEPA include Water Quality (within Hydrology and Water Quality analysis) and Biological Resources.

6.3.1 Resources with Significant Impacts

Biological Resources

Significant short-term noise impacts to non-special-status, including migratory, and special-status bird species would occur under CEQA and NEPA, respectively, as a result of construction activities under Alternative 1 and the proposed project, and during soil management activities. When in proximity to wildlife, the effects of construction noise may disrupt sensitive birds foraging or breeding behavior. During excavation and construction, noise generated by earth-moving equipment is mobile and would continually move throughout the site. The dynamic nature of the noise-generating construction equipment throughout the project site would limit the length of time a certain area is exposed to increased noise levels. However, relocation during the breeding season is not feasible for nesting birds and, even with the numerous project design features to reduce noise levels, this is considered a significant impact. Similarly, noise impacts to adjacent nesting least Bell's vireo could occur along Monument Road within TRNERR if trucking associated with soil management occurs during the breeding season. Mitigation measures such as noise walls and restriction of construction activities to outside the breeding season were considered but found infeasible due to potential site condition limitations with constructing noise walls (i.e., wet soils, adequate shoulder/roadway width) and the potential for the overall project duration to be longer if construction is halted during the breeding season versus continuing implementation throughout the year. Further discussion on why these mitigation measures were found infeasible is included in Section 4.6.4. Impacts would remain significant under CEQA and NEPA.

Air Quality

Under CEQA, significant temporary construction-related air quality impacts would result during construction activities associated with Alternative 1 and the proposed project, and during soil management activities. Construction-generated PM_{10} emissions would exceed applicable air quality standards, resulting in a significant impact to regional air quality. Feasible mitigation is included under AQ-1 but would not reduce the impact to less than significant under CEQA. No significant effects would occur under NEPA.

Water Quality (Within Hydrology and Water Quality Analysis)

Due to placement of material associated with soil management activities, significant impacts have been identified under CEQA and NEPA. A temporary exceedance in water quality standards could result from placement of material, specifically temporary and localized exceedances of bacteria/pathogens during soil placement within the swash zone. Feasible mitigation including soil testing prior to placement and water quality monitoring is included within mitigation measures Water Quality-1 and -2. While these mitigation measures would minimize the potential for water quality

violations, testing may not identify inactive or dormant bacteria and monitoring does not necessarily avoid the impact that may have already occurred. Feasible mitigation is included but would not reduce the impact to less than significant. Impacts would remain significant under CEQA and would represent a significant effect under NEPA.

6.3.2 Comparison of Alternatives

Alternative 1 includes the largest amount of material removal for restoration and enhancement, thus also requiring the largest volume of material to be addressed as part of soil management. This additional activity results in derivative effects such as a higher volume of truck trips, increased areas of disturbance, and higher noise levels, among others, as compared to the proposed project. In addition, Alternative 1 does not avoid existing, relatively higher quality habitat to the extent that the proposed project does. Thus, the degree of adverse impact for Alternative 1, relative to the proposed project that does not include the higher volume of excavated material or greater disturbance to existing higher quality habitat areas, is typically higher for most issue areas.

The proposed project typically has similar impacts to Alternative 1, except the proposed project considers smaller excavation quantities to achieve the proposed habitat distribution. The proposed project also intentionally avoids greater areas of relatively high-quality habitat. This minimizes the amount and degree of severity of impacts that result from the proposed project, both to existing biological resources and potential impacts that would result from smaller excavation quantities, relative to Alternative 1 for both restoration and enhancement and soil management. Significant and unavoidable short-term impacts to biological resources, air quality, noise, and hydrology and water quality would occur as a result of restoration and enhancement under the proposed project. Alternative 1 would have the most substantial impact as it includes the highest volume of excavated material and does not avoid existing habitats to the extent of the proposed project. The proposed project would have the least substantial impact due to the relative decrease in volume. Thus, impacts associated with soil management would be less as compared to Alternative 1.

The increased tidal prism associated with the proposed project, achieved with less excavation quantities as compared to Alternative 1, would slightly increase the beneficial impacts of the proposed project, such as improved tidal flow and healthier coastal salt marsh habitats. Beneficial impacts from an increased tidal prism would not occur to the same degree under Alternative 1 as compared to the proposed project. Beneficial impacts associated with the beach and swash zone nourishment, including sea level rise resiliency and a visually enhanced sandy beach, would occur under both Alternative 1 and the proposed project.

The No Project/No Action Alternative would not modify existing conditions and no actions would take place. Thus, no significant environmental impacts would occur from this alternative. However, the estuary would continue to deteriorate in habitat quality and hydrologic conditions if the proposed

project is not completed. While no significant impacts would occur, none of the beneficial or positive impacts that occur with the implementation of one of the project alternatives would result under the No Project/No Action Alternative.

The proposed project is a restoration and enhancement effort and has many proactive design features specifically included to minimize or reduce the potential for adverse effects to result from project implementation. In addition, mitigation has been proposed for those impacts that have been identified as significant. In some cases, such as cultural resources, Tribal cultural resources, and hazardous materials and public safety, the proposed mitigation was found to be adequate to reduce the adverse effect and result in less than significant impacts under CEQA. However, for some issue areas like air quality resources and water quality, the proposed mitigation would provide for some reduction of impact but would not fully reduce the impact to a level considered less than significant under CEQA. Significant effects to water quality and biological resources would occur under NEPA.

6.4 ENVIRONMENTALLY SUPERIOR AND ENVIRONMENTALLY PREFERRED ALTERNATIVE

CEQA

CEQA requires disclosure of the environmentally superior alternative, and if the No Project/No Action Alternative is environmentally superior, identification of a superior alternative among the other alternatives (Section 15126.6[e][2]).

The No Project/No Action Alternative would result in the fewest number of significant environmental impacts that are temporary in nature (Table 6-1) and could be considered environmentally superior for this reason. However, implementation of the No Project/No Action Alternative would result in the continued deterioration of the habitats, vegetation communities, and hydrologic conditions within the project site. No restored coastal salt marsh acreage would be established under the No Project/No Action Alternative, which would render the No Project/No Action Alternative inconsistent with the overall purpose of the project and would not achieve the project objectives (Section 1.3.2). Thus, the following discussion provides identification of an environmentally superior alternative between the two project alternatives.

Between the action alternatives, (Alternative 1, proposed project), the proposed project would result in the least CEQA significant environmental impacts as shown in Table 6-1. Due to the reduced excavation quantities, reduced hauling operations and a lesser amount of disturbance to the estuary setting relative to Alternative 1, many of the impacts that would result from the proposed project would also be to a lesser degree and extent than those resulting from Alternative 1. The proposed project is the environmentally superior alternative because it minimizes the disturbance to existing habitats, and increases the tidal prism and ability of the system to drain. Soil management that

identifies beach nourishment on-site is the environmentally superior alternative as it maximizes beneficial reuse of material on-site as beach nourishment. As a result of the minimized excavation, maximized beach nourishment, and overall increased benefits, the proposed project achieves the CEQA project objectives, as listed in Section 1.3.2, to the fullest extent or above the level the other action alternative (Alternative 1). Alternative 1 would meet the CEQA project objectives, but impacts would be greater in extent and degree than impacts identified under the proposed project.

NEPA

Section 1505.2(b)(2) of the CEQ Regulations requires NEPA lead agencies to identify the "environmentally preferable alternative" at the time of making a decision on the project. The NEPA purpose of the proposed project is to restore habitats and functions within the southern arm of Tijuana Estuary including restoring tidal prism, improving water quality and habitat quality by increasing tidal channel, mudflat, and salt marsh habitat needed to support healthy fish and wildlife populations. Maintaining an open condition is also identified to help support the tidal system and overall water quality.

Both Alternative 1 and the proposed project would meet the NEPA purpose of the project as they would increase the tidal prism and result in enhanced function and high-quality intertidal and transitional habitats while improving water quality. In addition, the beneficial reuse of materials on-site as beach nourishment meet the NEPA purpose of the project as restoring barrier beach would address the ongoing degradation and inward migration of this beach, and result in less impacts as compared to transporting material off-site. Habitat distributions under Alternative 1 would increase in intertidal channels and mudflat habitats within the estuary as compared to existing conditions. Additionally, other coastal salt marsh habitats like low, mid-, and high marsh habitat would replace existing upland, nonnative upland, and transitional habitat within the proposed marsh restoration areas. This alternative also includes the creation of transitional habitat along the southern border of the project site to protect restored interior portions from sedimentation influences. Water quality impairments identified, including sedimentation, would be addressed by this alternative through increased hydraulic efficiency and sediment removal. Open river mouth conditions would also be maintained to support the overall health and viability of the estuary complex. Significant effects would result with implementation of this alternative.

The proposed project would similarly result in an increase in intertidal channels, mudflat, coastal salt marsh, and upland and transitional habitat as compared to existing conditions. The proposed project focuses on more widespread areas of low marsh restoration, creating a connected gradient of habitats with Model Marsh, and avoids existing higher quality habitat within and adjacent to the project site. Transitional habitat would be established throughout portions of the low marsh, functioning as refugia from terrestrial predators for sensitive bird species such as the light-footed Ridgway's rail, while also establishing an area of transitional habitat along the southern portion of the project site. Excavation

quantities and resulting impacts are anticipated to be less under the proposed project as compared to Alternative 1 as well as impacts to existing habitats. The proposed project would increase the hydraulic efficiency, thereby aiding potential sedimentation influences post-restoration, and would maintain open river mouth conditions. Significant impacts would result with implementation of this alternative; however, due to smaller excavation quantities and avoidance of existing habitats, they would be less than the effects identified for Alternative 1. Therefore, the proposed project, with maximum beneficial reuse of materials on-site for beach nourishment, has been identified as the environmentally preferred alternative.

CHAPTER 7.0
OTHER CEQA/NEPA CONSIDERATIONS

7.1 GROWTH INDUCEMENT

Section 15126(g) of the CEQA Guidelines and the CEQ NEPA Regulations (40 CFR § 1508.1(g)) require a discussion of potential growth-inducing impacts of the proposed action and alternatives. Growth may be considered beneficial, adverse, or of no significance environmentally, depending on its actual impacts to the environmental resources present. A project may be growth inducing if it results in development of direct population-generating uses; provides accommodations for growth or removes obstacles to growth; requires expansion of public services or utilities; directly or indirectly fosters economic growth; or sets a precedent or facilitates other activities that could significantly affect the environment.

The environmental effects of induced growth are secondary or indirect impacts of a proposed project. Secondary effects of growth could result in significant, adverse environmental impacts, which could include increased demand on community or public services, increased traffic and noise, degradation of air and water quality, and conversion of agricultural land and open space to developed uses.

Restoration and enhancement of the estuary would not be considered growth inducing. No land use or zoning changes would be required for implementation of the proposed project and the estuary would remain as currently used for open space that is not proposed or designated for future development. No new homes or businesses are proposed. Implementation of the proposed project would not increase land use density or intensity in the project area as the restoration project would maintain the existing open space setting of the estuary. Construction and maintenance activities would require workers throughout the temporary construction period, as well as during intermittent maintenance events, but it is anticipated that most of these workers would come from the local workforce. Therefore, implementation of the proposed project would not result in a direct increase in population in the project area. While the proposed project would enhance the existing ecological functions of the estuary and support the surrounding passive recreation opportunities including enhanced beach recreation, it is not anticipated that the proposed project would attract sufficient numbers of new visitors to induce the expansion of existing tourist-related commercial uses.

7.2 ENVIRONMENTAL EFFECTS ELIMINATED FROM FURTHER ANALYSIS

Section 15128 of the CEQA Guidelines requires that the EIR “contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant

and were therefore not discussed in detail in the EIR." A brief description of the issue areas where effects were found not to be significant are provided below.

7.2.1 Agriculture

The proposed project area is currently open space and is not zoned or designated for agricultural use as it is a protected as a National Estuarine Research Reserve, National Wildlife Refuge, and State Park with no agricultural production occurring on-site. There are historically and currently some areas of active agricultural operations to the east of the project site; however, these operations would not be affected by the restoration and enhancement of the estuary as proposed by the project. Restoring and enhancing the estuary habitats and hydrologic function would not be of the nature to disrupt or conflict with agriculture in the area. Therefore, no impact to agriculture and/or forestry resources would occur.

7.2.2 Mineral Resources

Mineral resources are known to exist in the general project area. For example, the Nelson Sloan Quarry is approximately 2.5 miles east of the proposed project site and was an active sand and gravel quarry until mining operations ceased in 2002. However, the project site has not been an area of mineral extraction as it is protected as a National Estuarine Research Reserve, National Wildlife Refuge, and State Park. Furthermore, should future mineral resources be discovered on or near the proposed project area, implementation of the proposed project would not preclude mineral extraction. Therefore, the proposed project would not result in the loss of availability of a locally important mineral resource recovery site or known mineral resources that would be of value to the region and the residents of the state. No impact would occur.

7.2.3 Population and Housing

The proposed project does not include development of residential or commercial land uses and would not result in direct population generation from construction of new homes or businesses. Additionally, the proposed project does not include extension of roads or other infrastructure that would result in indirect population growth. There are no existing residential uses within the proposed project limits of disturbance; thus, implementation of the proposed project would not result in the displacement of existing housing, and no persons would be displaced. The open space setting of the estuary would be maintained. No impacts to population and housing would occur.

7.2.4 Wildfire

CalFire has developed Fire Hazard Severity Zones that measure the likelihood of an area burning and the severity of how it would burn based on factors such as fuel, slope, and fire weather. Portions of TRNERR, including the easternmost portion of the proposed project site and the surrounding areas to

the east, are designed as Very High Fire Hazard Severity Zones (CalFire 2020). This designation is likely due to the open areas with scrub vegetation that could fuel a wildfire; thus, wildland fire safety concerns in these areas exist due to the presence of native and exotic vegetation in proximity to residences and other developments. The proposed project would result in construction activities and access routes within the areas of Very High fire hazard designations. However, most restoration and enhancement work would occur within the wet marshy areas of the estuary, which are not high fire risk areas and are outside of the Very High fire hazard designations. Additionally, access routes through the Very High Fire Hazard Severity Zones would be located on existing roadways with minimal risk of accidental ignition of surrounding vegetation. Some proposed project work would be located in areas with existing vegetation. However, fire hazards from construction equipment or activities are not anticipated with implementation of the proposed project. Standard construction practices identified in Table 3-9 would be implemented to maintain fire safety such as maintaining fire suppression equipment on board equipment or at the worksite so that accidental fires could be quickly extinguished. Heavy equipment operators would be trained in appropriate responses to accidental fires so that an accidental fire would be dealt with expediently before spreading, and emergency communication equipment would also be available to site personnel to quickly call for help if an accidental fire were to occur and require additional assistance to be extinguished. Implementation of the proposed project would not introduce new or permanent structures within the estuary that would create or be subject to new or increased fire hazards. Construction or operation of the proposed project would not impair emergency response plans or exacerbate fire risks to people or structures. Therefore, no impacts related to wildfires would result.

7.3 UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL IMPACTS UNDER CEQA

Based on the analysis provided in Chapter 4, the following impacts are considered significant and unavoidable under CEQA; that is, no feasible mitigation is available to reduce the project's impacts to a less than significant level based on the identified CEQA significance thresholds.

Biological Resources

Construction within the restoration grading footprint and channel enhancement area would be scheduled outside the special-status bird breeding season as feasible. If construction occurs during that time, short-term significant impacts to birds, including least Bell's vireo, light-footed Ridgway's rail, and Belding's Savannah sparrow, may result from indirect noise impacts under CEQA. No long-term significant impacts would occur; ultimately, the noise levels would reduce to existing levels where these sensitive species are residents. However, no feasible mitigation is available for the potential short-term breeding season noise impact because site conditions may preclude the construction and effectiveness of noise walls as further described in Section 4.6.4, and the impact would remain significant and unavoidable with implementation of the proposed project.

Air Quality

Under CEQA, construction-related emissions would exceed the recommended level of significance for PM_{10} emissions, and construction activities could lead to a violation of an applicable air quality standard. While Mitigation Measure AQ-1 shows the fugitive dust emissions would be effectively reduced to a level below the thresholds of significance, there may be some limitations (e.g., inability apply chemical stabilizers to certain areas of the project site and inability to hydroseed or landscape disturbed areas based on project conditions). Therefore, fugitive dust emissions of PM_{10} could continue to lead to a violation of an applicable air quality standard and would remain significant and unavoidable with implementation of the proposed project.

Water Quality (Within Hydrology and Water Quality Analysis)

Due to beach nourishment associated with soil management activities, significant impacts have been identified under CEQA. A temporary exceedance in water quality standards could result from beach nourishment, specifically temporary and localized exceedances of bacteria/pathogens during soil placement within the swash zone. While Mitigation Measures Water Quality-1 and -2 provide testing and monitoring during beach nourishment, the potential for water quality exceedances for bacteria/pathogens would not be completely avoided. Water quality impacts from soil management would remain significant and unavoidable with implementation of the proposed project.

7.4 SIGNIFICANT IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

CEQA Guidelines (14 CCR 15126.2[c]) and NEPA (40 CFR § 1502.16(a)(4)) require analysis of significant irreversible and irretrievable effects. CEQA requires evaluation of irretrievable resources to ensure that their use is justified. NEPA requires an explanation of which environmental impacts are irreversible or would result in an irretrievable commitment of resources. This chapter analyzes the extent to which the proposed project's primary and secondary impacts would affect the environment and commit nonrenewable resources to uses that future generations will not be able to reverse.

Resources that are irreversibly or irretrievably committed to a project are those typically used on a long-term or permanent basis; however, some are considered short-term resources that cannot be recovered and are thus considered irretrievable. These resources may include the use of nonrenewable resources such as fuel, wood, or other natural or cultural resources. The unavoidable destruction of natural resources that limit the range of potential uses of that particular environment would also be considered an irreversible or irretrievable commitment of resources.

Implementation of the proposed project would result in the use of nonrenewable resources, including fossil fuels, natural gas, and water. Additionally, electrical power would be used for power generation

needs. The proposed project does not represent an uncommon construction project that would use an extraordinary amount of raw material in comparison to other restoration projects of similar scope and magnitude. There are no structures or other facilities proposed that would require the use of building materials. As such, TETRP II Phase I is not anticipated to consume substantial amounts of energy or use other resources in a wasteful manner. Since the proposed project would not induce growth or increased demand for resources in the area, changes to the natural environment would be limited to those related to initial construction or maintenance activities. Although the proposed project would result in the consumption of nonrenewable resources, the impact would not be considered significant.

Irreversible changes to the natural environment would occur within the estuary. The proposed project would change the ecological environment by removing existing vegetation and soils to establish appropriate elevations to support water quality improvements and establish a functional mix of wetland habitat and other native habitat that would thrive in the tidal estuary environment. Although the proposed project would result in the initial loss of some biological resources, the proposed project would not result in a net loss of native habitats and would protect and preserve native species within the estuary. While the proposed project would generate a significant change to the restored and enhanced portions of the existing estuary environment, the modifications are considered an improvement and biologically beneficial, as sustainable riparian habitats and the species they support are a valuable resource and would remain consistent with resource management of Border Field State Park and the Tijuana Slough NWR. Thus, the change to the natural environment would not be considered significant.

7.5 SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

The CEQ NEPA Regulations (40 CFR § 1500 *et seq*.) require that an EIS discuss issues related to environmental sustainability. This requires consideration of "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity" (42 U.S.C. 4332[C][iv]). In general, this discussion is not considered an environmental effect for which either significance is defined, or mitigation is recommended.

Short-term use of the environment would include dredging and excavation activities within the proposed project footprint as well as placement of appropriate materials in the nearshore and onshore coastal environments as analyzed throughout this document. Short-term construction-related impacts, defined for this project as impacts that occur during construction to project completion would result from implementation could include effects such as temporary increased turbidity and siltation, temporary loss of habitats before restoration, temporary generation of pollutant emissions from construction equipment, among others that are fully detailed throughout the analysis in Chapter 4.

However, the short-term uses of the environment and resources would serve to produce long-term overall benefits for many years after project completion. Some long-term benefits would include the

restoration of areas of former salt marsh, tidal channel, and mudflat affected by sedimentation with an increased tidal prism, maintenance of an open river mouth for improved water quality and reduction of potential hypoxic conditions, increased habitat for endangered species, and increased area of transition zone. In addition, carbon sequestration from the restored tidal salt marsh areas would help to offset some of the GHG emissions generated by implementation of the proposed project, and would continue to sequester carbon into the future at a higher rate than current site conditions.

CHAPTER 8.0
SUMMARY OF SUBMITTED ALTERNATIVES, INFORMATION, AND ANALYSIS

8.1 TITLE 40 CODE OF FEDERAL REGULATIONS SECTION 1502.17(B)

This chapter has been prepared in compliance with 40 CFR § 1502.17(b), which requires that a summary be provided in the Final Environmental Impact Statement (EIS) presenting all alternatives, information, and analyses submitted by State, Tribal, and local governments, and other public commenters for consideration by the lead and cooperating agencies in developing the Final EIS.

A total of six comment letters were received during the public comment period for the Draft EIR/EIS. Commenters included the U.S. EPA , CDFW, County of San Diego, San Diego Audubon Society, and two members of the public. All of the comment letters and full responses are available for review in Appendix D of this FEIR/EIS.

8.2 ALTERNATIVES

None of the comment letters received during the public comment period included requests for the development and/or evaluation of additional alternatives in the EIR/EIS.

8.3 INFORMATION

Each of the commenters provided some level of background information and other details related to the proposed restoration and/or their agency, organization, or personal opinions. That information is presented below for each commenter.

EPA

The DEIR/EIS was reviewed pursuant to the National Environmental Policy Act (NEPA and Section 309 of the Clean Air Act (CAA), which requires EPA to review and comment on proposed federal actions subject to NEPA's EIS requirement.

Wetland restoration projects are supported for the potential benefits to water quality and wildlife and to create resilience to climate change effects.

Typically, any sediment that is not far removed from pollution sources, not in a high energy environment, and less than 80% sand would need to be tested for physical, chemical, and biological

parameters to receive a suitability determination for discharge from the Southern California Dredged Material Management Team.

Executive Order 12898 directs federal agencies to pursue environmental justice to the greatest extent possible by identifying and addressing any disproportionately high and adverse human health or environmental effects that the agency's programs, policies, or activities may have on minority and low-income populations.

CDFW

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Id., § 1802).

CDFW is a Responsible Agency under CEQA, and has authority over (a) activities in streams and/or lakes that will divert or obstruct the natural flow; (b) changes in the bed, channel, or bank (including vegetation associated with the stream or lake) of a river or stream; and (c) use of material from a streambed. For any such activities, an entity must provide written notification to CDFW pursuant to Fish and Game Code Section 1600 et seq. Early coordination is recommended to determine if notification to CDFW is appropriate.

County of San Diego, Department of Parks and Recreation (County DPR)

County DPR owns and manages the Tijuana River Valley Regional Park, which is approximately 1,800 acres and located in the Tijuana River Valley adjacent to the Project. County DPR operates and maintains and extensive 22.5-mile trail network adjacent to the Project site which connects to the Border Field State Park trail system.

The site access/haul route along Monument Road and Hollister Road is adjacent to the County's new Tijuana River Valley Regional Park Campground and other recreational facilities.

The Nelson Sloan Quarry, a potential sediment disposal site for the project, is owned by County DPR.

San Diego Audubon Society

We recommend Alternative 2 or the "Proposed Project" as it will help to provide much-needed wetland habitat in the future that is currently vulnerable to Sea Level Rise.

Individual Commenter 1

I support the No Action Alternative.

Individual Commenter 2

Overall, the project appears to be an environmentally beneficial project that has been thoroughly researched and prepared for.

8.4 ANALYSES

Each of the commenters provided comments on various aspects of the analyses provided within the DEIR/EIS, with some requests for additional information and analysis, as described below. As indicated in Appendix D, revisions were made to the text of the FEIR/EIS in response to these requests for additional information and analysis. Please refer to the specific comments and responses, presented in Appendix D of the FEIR/EIS, to determine where in the FEIR/EIS these comments are addressed.

EPA

Several environmental concerns and deficiencies in the DEIR/EIS require additional information and analysis in the Final EIR/EIS, including evaluating the suitability of excavated sediments for placement at nearby beaches, which should be coordination with the Southern California Dredged Material Management Team.

Develop an adaptive management plan to monitor and assess fate and transport of sediment should be provided to ensure impacts to the marine environment are temporary, localized, and less than significant.

Haul traffic-related impacts may pose an individual or cumulative burden, therefore, additional information about the regional context of the construction haul routes should be included in the FEIS. 40 CFR 1501.3(b) of the NEPA regulations state that the temporary nature of an impact does not in itself make an impact less than significant without consideration of the context and intensity, or setting and degree of the effects.

Provide additional details about the reference population. Use EJScreen, CalEnviroScreen, and/or other sources, to develop maps that depict the demographic areas referenced in the EIS.

Discuss how the USFWS's consultation with Tribes is in accordance with the Service's policy, Federal requirements as outlined in the presidential "Memorandum on Government-to

Government Relations with Native American Tribal Governments" (April 29, 1994), and EO 13175.

Provide additional information about the regulatory approvals, or other permits, needed prior to project implementation.

CDFW

The project site supports several Federal and/or State listed, as well as California Fully Protected species, therefore avoidance of habitat occupied by these species should be avoided to the extent practicable. Specific buffers or survey timelines should be established and if project construction is necessary during the bird breeding season, a qualified biologist should conduct weekly bird surveys for nesting birds, and within three days prior to the work in the area to ensure no nesting birds would be impacted.

Incorporate avoidance and minimization measures that include exclusion methods to prevent sensitive reptile species from entering construction areas; address potential for western spadefoot.

Consider if there is a potential for project activities to spread Polyphagous and Kuroshio Shot Hole Borers.

Make project personnel aware of the potential for Rabbit Hemorrhagic Disease.

A map that indicates the distance and direction to the nearest hard bottom reef in relation to beach placement footprint should be provided.

Implement additional actions to protect California grunion, monitor for Pismo calms, protect marine fish, and avoid or minimize impacts to this the State Marine Conservation Area.

County DPR

County DPR recommends baseline and post-project surveys and monitoring in adjacent and upstream areas to capture any secondary impacts from tidal restoration on the hydrology, hydraulics, or vegetation type changes within the Tijuana River watershed.

Individual Commenter 1

Provide a detailed map that indicates those trails that would be affected by the project.

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