FINAL Environmental Impact Report / Environmental Impact Statement

San Clemente Dam Seismic Safety Project

volume 1, Chapter 1.0 - 3.0

January 2008

Prepared for

California Department of Water Resources
U.S. Army Corps of Engineers

US Army Corps of Engineers®

SCH 1 #997042007

Certification of the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) for San Clemente Dam Seismic Safety Project

The Final Environmental Impact Report/Environmental Impact Statement (Final EIR/EIS) for the San Clemente Seismic Safety Project prepared for the Department of Water Resources and United States Army Corps of Engineers by Entrix Environmental Consultants is now complete. As Chief of the San Joaquin District of the Department of Water Resources, the lead agency under CEQA, I have reviewed the Final EIR/EIS, including the responses to comments, on the Draft FEIR/EIS and other related documents.

In accordance with CEQA Guidelines Section 15090, I herby certify:

1. The Final EIR/EIS was completed in compliance with the California Environmental Quality Act (CEQA)

2. The Department of Water Resources has reviewed and considered the information contained in the Final EIR/EIS prior to approving it. In accordance with CEQA Guidelines Section 15094, a Notice of Determination will be filed after a decision to approve a project alternative is made.

3. The Final EIR/EIS reflects the Department of Water Resources' independent judgment and analysis.

Paula J. Landis
Chief San Joaquin District
Department of Water Resources

12-31-07
Date

INFORMATION COVER SHEET

San Clemente Dam Seismic Safety Project Draft Environmental Impact Report/Environmental Impact Statement

Lead Agencies: U.S. Army Corps of Engineers (NEPA Lead Agency); California Department of Water Resources (CEQA Lead Agency)

NEPA Cooperating Agencies: U.S. Department of Commerce, NOAA's National Marine Fisheries Service (NMFS); U.S. Department of Interior, Fish and Wildlife Service

CEQA Responsible and Trustee Agencies: California Department of Fish and Game (CDFG), California Public Utilities Commission, Monterey Peninsula Water Management District, Central Coast Regional Water Quality Control Board

Project Sponsor/Proponent: California American Water Company (CAW)

Project Title: San Clemente Dam Seismic Safety Project

Project Location: The project is located in an unincorporated area of Monterey County, California, at the confluence of the Carmel River (River Mile 18.5) and San Clemente Creek, approximately 15 miles southeast of the City of Carmel-by-the-Sea and 3.7 miles southeast of Carmel Valley Village.

Project Purpose, Need & Objectives: The need for the San Clemente Dam Seismic Safety Project is to increase dam safety to meet current design standards. The purposes and objectives for the project are to protect public safety by meeting current standards for withstanding a Maximum Credible Earthquake and Probable Maximum Flood at San Clemente Dam, provide fish passage at the dam, maintain a point of diversion to support existing water supply facilities, water rights and services, and minimize financial impacts to California-American Water ratepayers.

Abstract: This Final EIR/EIS analyzes the Proponent's Proposed Project (dam strengthening) and the following alternatives: Alternative 1 (dam notching with partial sediment removal), Alternative 2 (dam removal with total sediment removal), Alternative 3 (Carmel River reroute and dam removal with in-place sediment stabilization), and Alternative 4 (No Project). Chapter 2 contains summaries of each alternative, and Chapter 3 contains detailed descriptions. With the exception of No Project, all of the alternatives evaluated in this EIR/EIS meet the purpose, need and objectives.

Date of Implementation: Depending on the alternative selected, the San Clemente Dam Seismic Safety Project would be implemented within five to seven years after project approval, including environmental review, permitting, design, infrastructure improvements, and all aspects of construction or demolition.

INFORMATION COVER SHEET

List of possible permits, approvals, and licenses: See EIR/EIS Chapter 1.5 ("Overview of Permit Approval and Consultation Requirements, San Clemente Dam Seismic Safety Project").

Authors and principal contributors to the Final EIR/EIS: ENTRIX, Inc. is the principal author (See EIR/EIS Chapter 6.0 for individual contributors).

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Location of Background Information: You may access the Final EIR/EIS and find more information about the project and the responsible agencies on the Corps website at **http://www.spn.usace.army.mil/regulatory/currpn.html**, and on the DWR website at **http://www.sjd.water.ca.gov/environmentalservices/sanclemente/index.cfm** Copies of this Final EIR/EIS are also available for public review at the following locations:

California-American Water Co. Monterey Division 50 Ragsdale Drive, Suite 100 Monterey, CA 93942-0951	City of Monterey Library 625 Pacific Street Monterey, CA 93940
Monterey Peninsula Water Management District 5 Harris Court, Building G Monterey, CA 93940	City of Carmel-by-the-Sea, Harrison Library Ocean Avenue City of Carmel-by-the-Sea, CA 93921

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Bob Biacchi

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California Coastal Commission

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ABBREVIATIONS & ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AASHTO	American Association of State Highway and Transportation Officials
ADPA	Archaeological Data Preservation Act
ADT	Average Daily Traffic
AEP	Association of Environmental Professionals
AF	acre feet
AFY	acre-feet/year
AMBAG	Association of Monterey Bay Area Governments
amp	ampere
APE	Area of Potential Effect
AQMP	Air Quality Management Plan
ARB	Air Resources Board
ASR	aquifer storage and recovery
BA	Biological Assessment
BACT	Best Available Control Technology
BMPs	Best Management Practices
BO	Biological Opinion
BRM	bedrock mortar
CAA	Clean Air Act (Federal)
CAAA	Clean Air Act Amendments
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CAT	Caterpillar (bulldozer)
CAW	California American Water
CCAA	California Clean Air Act
CCRWQCB	Central Coast Regional Water Quality Control Board
CDFG	California Department of Fish and Game
CDHS	California Department of Health Services
CDMG	California Division of Mines and Geology
CDWR	California Department of Water Resources
CEQ	Council on Environmental Quality
CEQA	California Environment Quality Act

ABBREVIATIONS & ACRONYMS

USACE	United States Army Corps of Engineers
USC	United States Code
ug/L	Barium concentration
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
vpd	vehicles per day
vph	vehicles per hour
WCC	Woodward-Clyde Consultants
WY	water year
YOY	young-of-the-year

ABBREVIATIONS & ACRONYMS

CESA	California Endangered Species Act of 1984
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geologic Survey
CHL	California Historical Landmark
CMP	Construction Management Plan
CNDDB	California National Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CPUC	California Public Utilities Commission
CRDRP	Carmel River Dam and Reservoir Project
CRLF	California red-legged frog
CRHR	California Register of Historical Resources
CRP	Conservation Reserve Program
CRWC	Carmel River Watershed Conservancy
CSLC	California State Lands Commission
CVFP	Carmel Valley Filter Plant
CVMP	Carmel Valley Master Plan
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
CWP	Coastal Water Project
cy	cubic yards
CY	construction year
DA	Department of the Army
dB	decibel
dBA	decibels on the A-weighted scale
DEIR	Draft Environmental Impact Report
DHS	(California) Department of Health Services
DO	dissolved oxygen
DPM	Deputy Project Manager
DPR	(California) Department of Parks and Recreation
DPS	Distinct Population Segment
DSOD	Division of Safety of Dams

ABBREVIATIONS & ACRONYMS

DWR	(California) Department of Water Resources
EC	Environmental Coordinator
ECMP	EPNG Environmental Compliance Management Plan
ECS	Environmental Compliance Supervisor
EFZ	earthquake fault zone
EI	Environmental Inspector
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJSA	Environmental Justice Study Area
EM	Environmental Manager
EMFAC	Emissions Factors
EO	Executive Order
FMP	Federal Maintenance Plan
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESALs	equivalent single axle loads
ESJA	environmental justice study area
ESU	Endangered Species Unit
ESUs	Evolutionarily Significant Units
FEMA	Federal Emergency Management Agency
FMP	Federal Maintenance Plan
fsp	feet per second
g/sec	gallons per second
gpm	gallons per minute
GCC	Global Climate Change
GCD	General Conformity Determination
GCR	General Conformity Rule
GHG	greenhouse gas
GIS	Geographical Information System
GPS	Global Positioning Software
H^2S	Hydrogen Sulfide
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAP	hazardous air pollutant

ABBREVIATIONS & ACRONYMS

HCA	High Consequence Area
HCM	Highway Capacity Manual
HP	horsepower
HRI	Historic Resources Inventory
HUD	Housing and Urban Development
I/M	Inspection and maintenance (program)
IRWMP	Integrated Regional Water Management Plan
JPA	Joint Powers Authority
kV	kilovolt
kVa	kilovolt-ampere
kW	kilowatt
LEDPA	least environmentally damaging practicable alternative
L	limited
lb	pound
Ldn	day-night sound level
Leq(24)	24-hour equivalent sound level
LOS	level of service
LPD	Los Padres Dam
M	moderate
m/s	meters per second
m^2	Meter (squared)
m^3	cubic meters
MAOP	maximum allowable operating pressure
MBFZ	Monterey Bay Fault Zone
MBUAPCD	Monterey Bay Unified Air Pollution Control District
MCE	Maximum Credible Earthquake
MCWD	Marina Coast Water District
MCPBID	Monterey County Planning and Building Inspection Department
MEI	Mussetter Engineering, Inc.
mg/l	milligrams per liter
mgd	million gallons per day
MMCRP	Mitigation Monitoring Compliance Reporting Plan
MMP	Mitigation Monitoring Plan
MOA	Memorandum of Agreement

ABBREVIATIONS & ACRONYMS

MOU	Memorandum of Understanding
MP	milepost
mph	miles per hour
MPWMD	Monterey Peninsula Water Management District
MRWPCA	Monterey Regional Water Pollution Control Agency
MSL	Meters above sea level
MUC	Multiple Use Class
MWH	Montgomery, Watson and Harza
MVM	million vehicle miles
MY	migration year
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCCAB	North Central Coast Air Basin
NDDB	Natural Diversity Data Base
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NLPD	New Los Padres Dam
NMCH	see ROG, ROC
NMFS	National Oceanic and Atmospheric Administration Fisheries
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
NTUs	Nephelometric Turbidity Units
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
O_3	ozone
O&M	operation and maintenance

ABBREVIATIONS & ACRONYMS

OCRB	Old Carmel River Dam Bridge
OCRD	Old Carmel River Dam
OD	outside diameter
OHP	(California) Office of Historic Preservation
OHV	off-highway vehicle
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Administration
p	pressure (sound)
Pb	lead
p_o	referenced pressure
PCE	passenger car equivalent
PE	Project Engineer
PEA	Proponent's Environmental Assessment
PERP	Portable Equipment Registration Program
PFMC	Pacific Fisheries Management Council
PG&E	Pacific Gas and Electric
PHI	Points of Historical Interest
PM_{10}	particulate matter less than 10 microns
PMF	Probable Maximum Flood
ppm	parts per million
PRC	Public Resources Code
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
P/SM	Pajaro/Sunny Mesa Community Services District
RDEIR	Recirculated Draft Environmental Impact Report
PVC	Polyvinyl Chloride
RFFA	Reasonably Foreseeable Future Actions
RHI	Rearing Habitat Index
RM	River Mile
RMP	Resource Management Plan
RO	reverse osmosis
ROC	reactive organic compounds
ROD	Record of Decision
ROG	Reactive organic gases

ABBREVIATIONS & ACRONYMS

RSPA	Research and Special Programs Administration
RTU	remote terminal unit
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SBC	Southern Bell Communications
SCAQMD	Southern California Air Quality Management District
SCCC	South-Central California Coast
SCD	San Clemente Dam
SCEDC	Southern California Earthquake Data Center
scf	standard cubic foot
SCS	Soil Conservation Service
SEV	Severity of Effect
SHEMP	Seismic Hazards Evaluation and Mitigation Plan
SHHA	Sleepy Hollow Homeowners Association
SHPO	(California) State Historic Preservation Office
SHSRF	Sleepy Hollow Steelhead Rearing Facility
SHW	Sleepy Hollow Weir
SIP	State Implementation Plan
SO	sulfur oxide
SO^2	sulfur dioxide
SOMP	Sediment Operation and Management Plan for Fish Passage
SPL	sound pressure level
SPCC Plan	Spill Prevention Containment and Countermeasure Plan
SR	State Route
SSC	Suspended Sediment Concentrations
Sta	Station
SWRCB	State Water Resources Control Board
SWPPP	Stormwater Pollution Prevention Plan
TCP	traditional cultural properties
TES	threatened, endangered, and special-status
TI	Traffic Index
TCPs	traditional cultural properties
UECRM Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
URBEMIS	Urban Emissions (software)

CHAPTER 1.0

INTRODUCTION

1.0 INTRODUCTION

1.1 AUTHORIZATION AND AGENCY ROLES

The California Department of Water Resources (DWR) and the U.S. Army Corps of Engineers (USACE) have prepared this Final Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) under the California Environment Quality Act (CEQA) of 1970, and the National Environmental Policy Act (NEPA) of 1969.

The EIR/EIS addresses the San Clemente Dam Seismic Safety Project. The EIR/EIS is an informational document for both lead agency decision-makers and the public regarding the environmental effects of the proposed San Clemente Dam Seismic Safety Project. The DWR is the state lead agency responsible for certifying this EIR/EIS and filing a Notice of Determination (NOD) under CEQA, and the USACE is the federal lead agency responsible for issuing a Record of Decision (ROD) under NEPA. The National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS) are federal cooperating agencies.

1.2 PROJECT PROPONENT AND BACKGROUND

The California American Water Company (CAW) is an investor-owned public water purveyor that is regulated by the California Public Utilities Commission (CPUC). The Coastal Division of CAW provides public water service to the Monterey Peninsula, and owns and operates San Clemente Dam (SCD) and Reservoir. This thin arch concrete dam is located 18.5 miles upstream from the mouth of the Carmel River, below its confluence with San Clemente Creek. The reservoir was constructed as a water supply project and provides a physical diversion point on the Carmel River from which water flows to the Carmel Valley Filter Plant and is distributed to the Carmel Valley Village area and other down-gradient areas. Although the SCD initially impounded a reservoir of about 1,425 acre-feet at the spillway elevation of 525 feet, it has never served as a water storage or flood control project. More than 2.5 million cubic yards of sediment have accumulated behind the Dam since it was constructed in 1921.

The Dam includes a fish ladder that allows steelhead trout, a federally listed threatened species, to ascend 68 feet over the Dam to use the watershed above the Dam. The California red-legged frog, another federally listed threatened species and a California State species of special concern, also uses habitat at the reservoir and along the river and creek.

1.3 AGENCY DECISIONS TO BE MADE

The DWR Division of Safety of Dams (DSOD) commissioned engineering studies in the early 1990's to evaluate seismic safety of SCD. These studies concluded that the Dam could suffer structural damage leading to the potential loss of the reservoir during a Maximum Credible Earthquake (MCE). In addition, under the Probable Maximum Flood (PMF), water could overtop the Dam, possibly eroding the downstream abutment area

and posing the risk of dam failure. Based on these findings, DSOD has required that SCD be brought into compliance to withstand loading from a MCE on nearby faults and safely pass the PMF. The MCE at the Dam site was determined by DSOD to be a magnitude 7.0 event originating from the Tularcitos Fault, 1.25 miles away. The PMF at the Dam site was determined by DSOD to be about 81,000 cfs. CAW has filed a design application with DSOD to strengthen San Clemente Dam to bring it into compliance with DSOD requirements. DSOD has determined that the San Clemente Dam Seismic Safety Project may have a significant environmental impact and therefore requires the preparation of an EIR.

As part of the SCD Seismic Safety Project, CAW has applied to the USACE for authorization to deposit approximately 3,200 cubic yards of fill material into Waters of the U.S. to strengthen SCD. This application is being processed under Section 404 of the Clean Water Act (CWA). The USACE has determined that the SCD Seismic Safety Project may have a significant impact on the quality of the human environment and therefore requires preparation of an EIS.

1.4 PROJECT PURPOSE, NEED & OBJECTIVES

Under NEPA, an EIS requires a statement of purpose and need (40 CFR 1502.13). The need is the broad underlying necessity or requirement to which the NEPA lead agency is responding.

Consequently, the need determines the range of alternatives that must be studied and the alternatives considered under NEPA must meet the project need. The proposed action, or project, is not the need in itself, but is rather the lead agency's proposed response to the need for the project. Typically, the proposed action is only one of a number of alternatives that will meet the stated need.

The purpose(s) are typically the specific objectives of the proposed action, by which the need will be met. Project purposes do not define the need, but respond to it by drawing in related considerations that must be integrated into the overall project. Under NEPA and the USACE's implementing regulations, the terms "basic" and "overall" purposes are used to identify important features and/or results the project alternatives must meet.

Statements of purpose and need are intended to be comprehensive enough to adequately encompass the need, and specific enough to guide the development of alternatives.

The NEPA statement of purpose and need is similar to what CEQA calls "objectives." The CEQA Guidelines[1] Section 15124(b), states that the project description must include "a statement of objectives sought by the proposed project" and that the objectives are intended to help the lead agency develop a reasonable range of alternatives to evaluate in an EIR (in this way objectives are similar to the NEPA need).

[1] California Code of Regulations, Title 14, Chapter 3 (Sections 15000 through 15387); commonly referred to as CEQA Guidelines.

Objectives also aid decision-makers in preparing findings or statements of overriding considerations (if necessary). The Guidelines further state "the statement of objectives should include the underlying purpose of the project."

Alternatives considered in an EIS must meet the need to which the lead agency is responding. The evaluation of alternatives must consider and address the project's purposes. The environmental evaluation presented in an EIR/EIS as well as the findings made when approving a project alternative also must consider and address the overall project objectives, which include the underlying project purpose. However, while CEQA encourages decision-makers to select alternatives that meet project objectives, it does not require that the approved project meet all project objectives.

For this EIR/EIS, the NEPA and CEQA requirements of stating the underlying requirement to which the project responds (which NEPA terms the "need" and CEQA refers to as its "purpose" and includes among the project objectives) is met by the following statement of the project need:

The need for the SCD Seismic Safety Project is to increase dam safety to meet current standards for withstanding a MCE and passing the PMF at the Dam.

The purposes and objectives for the project under NEPA and CEQA are to:

- Protect public safety.
- Provide fish passage at the Dam.
- Maintain a CAW point of diversion on the Carmel River to support existing water supply facilities, water rights, and services.
- Minimize financial impacts to CAW rate payers.

CAW's Proponent's Proposed Project and the alternatives to it that are evaluated in this EIR/EIS meet the need of eliminating safety risks associated with the MCE and PMF at the Dam and address the objectives stated above.

1.5 FEDERAL, STATE, AND LOCAL REQUIREMENTS

In addition to DWR and USACE, several federal, state, regional, and local agencies and decision-making bodies have jurisdiction over affected resources or have other permitting or regulatory authority. These agencies and decision-makers will review and consider the information contained in this EIR/EIS, and will consider it in their decision processes. Table 1.5-1 lists the agencies expected to use this EIR/EIS as part of their decision-making processes.

Table 1.5-1: Overview of Permit Approval and Consultation Requirements for San Clemente Dam Seismic Safety Project

Jurisdiction	Permits, Approvals & Consultations
FEDERAL AGENCIES	
U.S. Army Corps of Engineers (USACE)	Section 404 Permit, Clean Water Act (CWA). The USACE must determine compliance with Section 404(b)(1) guidelines. The permit will authorize any release of accumulated sediment from the Dam, the construction of two cofferdams in the Carmel River at the downstream toe of the Dam, temporarily dewatering the reservoir and plunge pool, and improving the bridge across the Carmel River at the Old Carmel River Dam (OCRD). Acts as NEPA lead agency, issues a Record of Decision (ROD). The ROD is a written public record explaining the lead agency's decision on the proposed action.
U.S. Fish and Wildlife Service (USFWS)	Administers Endangered Species Act (ESA) for certain federally listed species (including California red-legged frog). Consults under Section 7 of the ESA with the lead federal agency (USACE). Determines whether a proposed action is likely to jeopardize the continued existence of, or destroy or adversely modify critical habitat of federally listed species. If appropriate, issues a Biological Opinion with an Incidental Take Statement for affected species.
National Marine Fisheries Service (NMFS)	Administers ESA for federally listed marine mammals and marine and anadromous fish (including steelhead). Consults under Section 7 of the ESA with the lead federal agency (USACE). Determines whether a proposed action is likely to jeopardize the continued existence of, or destroy or adversely modify critical habitat of federally listed species. Issues a Biological Opinion (BO) with an Incidental Take Statement for affected species.
Other federal permits/regulations: Clean Air Act (CAA) Conformity Statement, Executive Order (E.O). 11990 Wetland Protection, E.O. 11988 Flood Management, E.O. 12898 Environmental Justice, Magnuson-Stevens Act (essential fish habitat)	
STATE AGENCIES	
California Department of Water Resources, (DWR)	Acts as CEQA lead agency. Certifies the EIR was prepared pursuant to CEQA, adopts CEQA Findings and files a Notice of Determination (NOD) for the selected project.
California Department of Water Resources, Division of Safety of Dams (DSOD)	Approves an application to repair, alter, or remove a dam.
California Office of Historic Preservation (SHPO)	Section 106, National Historic Preservation Act (NHPA). The alteration of the structure of the Dam requires evaluation, since the facility is more than 50 years old. The project includes repairing, altering or removing the bridge that crosses the Carmel River at the Old Carmel River Dam (OCRD), which is also more than 50 years old.
California Department of Transportation (Caltrans)	Transportation Permit. Required for transport of oversized loads on state highways. (This permit is usually obtained by the construction contractor or subcontractors.)
California Public Utilities Commission (CPUC)	Regulates investor owned utilities to authorize investments and related rate changes.
California Department of Fish and Game (CDFG)	California Trustee Agency (CEQA Guidelines section 15386) with jurisdiction over natural resources affected by a project which are held in trust for the people of the State of California with regard to the fish and wildlife of the State, to designated rare or endangered native plants, and to game refuges, ecological reserves, and other areas administered by the department. Streambed Alteration Agreement (California Fish and Game Code Sections 1601 and 1603 permits). Issues agreement with conditions to protect resources whenever a bed or bank of stream, lake or reservoir is altered. Issues incidental take permits for State-listed species. (Note: Other CDFG code sections may apply, including operation of dams to maintain fish in healthy condition downstream of the Dam (5937) and prohibitions against release of substances deleterious to aquatic life (5650). These sections of the Fish and Game Code would subject the project to citation if there were a violation. CDFG also oversees the annual Memorandum of Agreement (MOA) negotiated among CAW, Monterey Peninsula Water Management District (MPWMD) and CDFG) that addresses releases to the river from Los Padres reservoir.
Regional Water Quality Control Board (RWQCB)	Certification or waiver of certification according to Section 401 of the Clean Water Act (CWA) for construction related disturbance of water quality. The project may require a National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity.

Table 1.5-1: Overview of Permit Approval and Consultation Requirements for San Clemente Dam Seismic Safety Project, continued

Jurisdiction	Permits, Approvals & Consultations
STATE AGENCIES	
State Water Resources Control Board (SWRCB)	Approves and establishes project plans for a new point of diversion.
REGIONAL AGENCIES	
Monterey Bay Unified Air Pollution Control District (MBUAPCD)	Administers Air Quality Management Plan (AQMP) for Monterey Bay Region, Federal Maintenance Plan (FMP), and General Conformity Rule (GCR). May require permits for stationary equipment used in construction including mobile batch plants, compressors and generators unless this equipment is registered by the state, in which case only an inspection fee is required. A special permit may be required if sandblasting is used for surface preparation of the downstream face of the existing dam. A General Conformity Determination under the Clean Air Act is included as Appendix H to this EIR/EIS.
LOCAL AGENCIES	
Monterey Peninsula Water Management District (MPWMD)	Responsible for allocating production limits for the Monterey Peninsula Water Resource System. Administers annual mitigation program for the Monterey Peninsula Water Management District (MPWMD) Water Allocation Program. Issues River Access and River Work Permits. Participates in the development of an annual MOA with CAW and the CDFG that addresses releases to the river from Los Padres Reservoir.
Monterey Peninsula Regional Park District	MPRPD is not a regulatory agency, but owns and is responsible for the management of 919 acres of Carmel River watershed in the Project Vicinity. Over the next ten years, the MPRPD will be preparing a park management plan for the property. Areas of concern for the MPRPD include public access, sediment disposal on park land, and riverfront access and river restoration. MPRPD staff and Board reviews and comments on mitigation measures regarding MPRPD-owned land.
County of Monterey Public Works Department	Grading and encroachment permits for access road widening and improvements. Reviews code compliance for preservation of oak and other protected trees.
County of Monterey Water Resources Agency	Reviews work in the Carmel River bed described in the Section 404 permit, and proposed access road improvements. If floodplain remapping is required, a Letter or Map Revision or Conditional Letter of Map Revision may be issued.

1.5.1 FEDERAL REQUIREMENTS

NEPA / CEQA

A joint EIR/EIS must contain all the required elements of both the NEPA (P.L. 91-190; 42 (United States Code) U.S.C. 4321-4347; (Code of Federal Regulations) CFR §1500 et seq.) and the CEQA (Public Resources Code (PRC) §21000 et seq.). The two processes have many similarities, but also a few important differences. The following discussion highlights those differences and explains how this document incorporates the requirements of both. In general, the approach has been to meet the requirements of the more stringent of the two laws wherever they differ.

Significance

One of the primary differences between NEPA and CEQA is the way significance is determined and discussed in environmental documents. Under NEPA, significance is used to determine the need to complete an EIS as opposed to some lesser level of documentation. NEPA requires that an EIS be prepared when the proposed federal action (project) as a whole has the potential “to significantly affect the quality of the human environment.” The determination of significance is based on context and intensity of impacts. Under NEPA, once a decision to prepare an EIS is made, it is the

magnitude of the impact that is evaluated and no judgment of its significance is required. NEPA does not require that a determination of significant impacts be stated in environmental documents.

CEQA does require California agencies to identify each "significant effect on the environment" that a project may have on the environment, and ways to mitigate or avoid each significant effect. A significant effect on any environmental resource triggers the preparation of an EIR. Each and every significant effect on the environment must be disclosed in the EIR and mitigated or avoided if feasible. In addition, CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. At the end of the CEQA process, the lead agency must determine whether the project as approved will have a significant effect on the environment. There are no requirements under NEPA that parallel these requirements of CEQA.

The proposed San Clemente Dam Seismic Safety Project has been determined to require an EIR under CEQA and an EIS under NEPA. This joint EIR/EIS has been prepared to meet CEQA requirements for disclosing and identifying feasible mitigation for every significant effect, and NEPA requirements to evaluate the magnitude of impacts based on context and intensity.

EIR/EIS Content and Process

Under NEPA, an EIS must describe the environmental impacts of the proposed action; any adverse environmental effects that cannot be avoided; alternatives to the proposed action; the relationship between local, short term uses of the human environment and maintenance and enhancement of long term productivity; and any irreversible and irretrievable commitments of resources that would be involved in the proposed action. This document meets those NEPA requirements.

Under CEQA, an EIR must describe all significant effects on the environment that may be caused by the proposed project; significant effects that cannot be avoided; any irreversible effects; proposed mitigation measures; project alternatives; and growth-inducting impacts. This document meets those CEQA requirements.

Requirements for alternatives analysis differ between CEQA and NEPA. CEQA discusses the proposed project in detail and requires only enough information about alternatives to allow a meaningful comparison. NEPA requires that a reasonable range of alternatives be analyzed and discussed in comparable detail. This joint document meets the NEPA standard.

Air Quality and Conformity Statement

For joint NEPA/CEQA documents, the air quality analysis and technical report must comply with the federal CAA, and must contain a regional air conformity statement and a project level conformity statement (see air quality permitting discussion below). Evaluation of project impacts on air quality is included in Section 4.7 of this EIR/EIS.

Cultural Resources

Joint documents and cultural resources reports must comply with Section 106 of the NHPA. Surveys and reports prepared pursuant to Section 106 must be sent to the SHPO for concurrence (see cultural resources permitting discussion below). Evaluation of project impacts on cultural resources is included in Section 4.10 of this EIR/EIS.

Waters of the U.S. and Wetlands

Section 404 of the CWA (33 USC 1344) authorizes the USACE to issue permits, after notice and opportunity for public hearing, for the discharge of dredge or fill material into the Waters of the United States and adjacent wetlands. The decision to issue a permit is based on an evaluation of the probable impacts, including cumulative impacts, of the project and its impacts on the quality of the human environment (also see discussion of floodplains and wetlands permitting below).

For actions subject to NEPA where the USACE is the lead agency, the analysis of alternatives required for NEPA environmental documents will, in most cases, provide the information for the evaluation of alternatives under the Section 404(b)(1), *Guidelines for Specification of Disposal Sites for Dredged or Fill Material.* The Section 404(b)(1) Guidelines, published by the Environmental Protection Agency (EPA) in conjunction with the USACE, contain substantive environmental criteria used in evaluating discharges of dredged or fill material. Under these guidelines, no discharge can be permitted if a practicable alternative with less adverse impact on the aquatic environment (unless the identified alternative poses other significant environmental consequences) is available. In completing the ROD under NEPA, the USACE will require a Section 404 permit compliance and select a project that conforms to Section 404(b)(1) Guidelines. This is commonly called the Least Environmentally Damaging Practicable Alternative (LEDPA), although the term actually does not occur in the Guidelines. An alternative is considered practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. However, the USACE's evaluation of a Section 404 permit application is a two part test involving (1) a determination of whether the project complies with the Section 404(b)(1) Guidelines, and (2) a public interest review. This public interest review is a balancing test in which the public and private benefits of a project are compared against its adverse impacts to the environment. It includes such considerations as conservation, economics, aesthetics, navigation, fish and wildlife values, water supply, water quality, energy needs, flood damage prevention, and cultural resources. The USACE also considers all comments received in the permit process, whether in response to a public notice or a public hearing. A permit cannot be issued or an application must be denied if the project fails to comply with the Guidelines or is found to be contrary to the public interest.

Floodplains / Wetlands

The San Clemente Dam Seismic Safety Project is within the 100-year floodplain of the Carmel River and San Clemente Creek. The USACE mandates that impacts to

floodplains and wetlands be assessed and alternatives for protection of these resources be evaluated in accordance with Compliance with Floodplain/Wetlands Environmental Review Requirements (10 CFR 1022.12) and Federal E.O 11988 and E.O. 11990. Evaluation of project impacts on floodplains and wetlands is included in Section 4.8 of this EIR/EIS and constitutes the floodplain/wetlands assessment. The USACE published a notice of floodplain/wetlands involvement for this project in the *Federal Register* as part of its Notice of Intent. The ROD will contain the statement of findings for floodplain/wetlands impacts.

USACE Regulation of Discharge of Sediments

The USACE has published Regulatory Guidance Letter No. 05-04, providing guidance on the discharge of sediments from or through a dam and the breaching of dams, for purposes of Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899. The letter addresses releases of sediments from or through dams that require USACE permits. The guidance is not intended to require a USACE permit for routine high water flow dam operations that allow sediment-laden waters to flow from or through a dam; however deviations from normal dam operations resulting in the discharge of bottom sediment may require a USACE permit.

Sluicing of sediments through a dam is considered hydraulic dredging and the discharge of dredged material from a point source (i.e., The Dam) and requires a USACE permit pursuant to Section 404 of the CWA. Discharges of sediment through a dam are exempt from regulation when released for dam maintenance (but not for any other purpose such as maintenance of the reservoir pool). To be exempt, discharges of sediments through a dam would have to be necessary for essential dam maintenance. The USACE states that it is rarely necessary to sluice substantial quantities of sediments through a dam in order to accomplish essential dam maintenance and the Subsection 404(f) exemption will rarely, if ever, be applicable to the discharge of large quantities of sediments through a dam. A Sediment Operations and Management Plan (SOMP) (Appendix J) has been developed for sluicing under the Proponent's Proposed Project or Alternative 1.

Discharge of sediments may also require a USACE Section 10 permit if they occur in "navigable waters of the United States". This policy includes breaching of dams when sediment has accumulated in the reservoir basin and is released downstream.

Discharges of sediments may also be potentially regulated as fill material. Final revisions to the CWA Section 404 Regulatory Program defines "fill material" as material placed in Waters of the U.S. where the material has the effect of either replacing any portion of a water of the U.S. with dry land or changing the bottom elevation of any portion of a water. Based on this "effect" determination, USACE permits are generally required for the discharge of sediments from dams when such activities would have the effect of raising the bottom elevation of the downstream waters to a discernible, substantial degree.

The release of sediments incidental to normal dam operations is considered a de minimis discharge. These discharges do not trigger the need for a USACE permit so long as they are consistent with sediment loads entering the reservoir from upstream.

Some activities are not considered regulated discharges and do not require USACE permits, including actions such as the operation of continuously sluicing structures that mimic the natural increase and decrease of sediment in a stream; breaching or removal of a dam that results in the movement of only de minimis amounts of material or that results solely from an act of nature; releases during times of high water or flood stages for purposes of passing flood waters through the Dam; and the lowering of lake or pond levels that results in the release of only de minimis amounts of sediment.

The USACE may permit a reservoir to be drawn down and dredged material to be discharged downstream to avoid potential catastrophic dam failure, subject to emergency permitting procedures found at 33 CFR 325.2(e)(l).

Sluicing through a dam of less than 25 cubic yards of material may be authorized under Nationwide Permit 18. Districts may also develop Regional General Permits for larger amounts of sediments to be released through a dam. Small releases of sediments may be authorized under Nationwide Permit 23 if an agency has an approved Categorical Exclusion.

When discharging sediment from or through a dam or breaching a dam, the USACE requires reasonable measures to reduce potential harm to downstream waters. Reasonable measures include prior dewatering by pumping or by releasing water from the upper control structures on a reservoir; mechanical dredging or excavation of sediments and appropriate disposal; timing releases to coincide with high water periods for better dilution; more frequent flushing to keep the discharges small; releasing a sediment amount that is dependent on the amount of water flow; and installing temporary barriers to prevent exposed sediments from being transported by runoff from subsequent storm events.

Endangered Species Act (ESA)

The Federal Endangered Species Act (cited as ESA throughout this document) of 1973(16 United States Code [USC] 1536) as amended in 1988, establishes a national program for the conservation of threatened and endangered species of fish, wildlife and plants, and the preservation of the habitat critical to the survival of listed species. The purpose of the ESA is to conserve the ecosystems upon which endangered and threatened species depend and to recover listed species. Under the law, species may be listed as either “endangered” or “threatened.” “Endangered” is defined as a species in danger of extinction throughout all or a significant portion of its range. “Threatened” is defined as a species likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing. All federal agencies are required to protect listed species and protect their habitats. Federal

agencies must use their authority to conserve listed species and ensure that their actions do not jeopardize the continued existence of listed species.

The ESA defines procedures for listing species, designating critical habitat for listed species, and preparing recovery plans. It also specifies prohibited actions and exceptions. The USFWS has primary responsibility for enforcing ESA with respect to terrestrial and freshwater organisms, while NMFS is responsible for enforcing ESA when marine species, including anadromous fish, are concerned.

Section 7(a) of the ESA requires federal agencies to ensure that the actions they authorize, fund, and carry out do not jeopardize species listed as threatened or endangered or their critical habitats. Section 7 provides that a project applicant may request consultation between a federal permitting agency and the USFWS or NMFS Fisheries (collectively, the "Services") if the applicant has reason to believe that a listed species is likely to be affected by a proposed project. The federal agency prepares a Biological Assessment (BA), which is reviewed by the Services. The responsible Service issues a BO regarding how the proposed action will affect listed species or critical habitat. If the Service determines that a proposed action will jeopardize the continued existence of a listed species, the Service must issue a BO offering “reasonable and prudent alternatives” about how the proposed action could be modified to avoid jeopardy.

Two federally listed threatened species occur in the Carmel River watershed and are present on the project site: the South-Central California Coast Steelhead (*Oncorhynchus (=Salmo) mykiss)* Evolutionary Significant Unit (ESU), and the California red-legged frog (*Rana draytonii*). The California red-legged frog is also listed under the California Endangered Species Act (CESA) as a species of special concern. Steelhead use the Project Area for migration, reproduction and juvenile rearing, however adult life stages occur primarily in the ocean. California red-legged frogs use the Project Area for all life history stages including reproduction, juvenile rearing and feeding and movement by adults. California red-legged frogs require aquatic habitats for egg laying and the development of tadpoles to juvenile frogs. Juvenile and adult frogs are dependent upon both terrestrial and aquatic habitats. Steelhead and steelhead habitat is under the jurisdiction of NMFS and the CDFG. California red-legged frogs and their habitat are under the jurisdiction of the USFWS and the CDFG. Designated critical habitat for both species occurs within the Project Area. Under a Settlement Agreement negotiated with the USFWS, CAW agreed to monitor, rescue, and translocate California red-legged frogs found in drying sections of the river to minimize effects of water pumping until a Habitat Conservation Plan is developed.

Potential impacts to threatened or endangered plants, wildlife, and fish species are discussed in Sections 4.4 and 4.5 of this EIR/EIS.

Under a 2001 Conservation Agreement negotiated with NMFS, CAW agreed not to divert water at San Clemente Dam during low flow periods (defined as 5 consecutive

days of 20 cfs or less flow as measured at the Don Juan gage). CAW also agreed to restrict its production from its upper Carmel Valley wells during low flow periods.

Fish and Wildlife Conservation Act

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. In addition, the Fish and Wildlife Coordination Act (16 USC 661 et seq.) requires federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources. These agencies have been sent copies of the Draft EIR/EIS and their comments have been considered. These agencies will also receive copies of the Final EIR/EIS.

Mitigation designed to conserve fish and wildlife and their habitat is provided in the sections in Sections 4.4 and 4.5 of this EIR/EIS.

Essential Fish Habitat (Magnuson-Stevens Act)

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended, requires Essential Fish Habitat (EFH) descriptions in federal fishery management plans and requires federal agencies to consult with NMFS on activities that may adversely affect EFH. The regulations implementing the EFH provisions of the Magnuson-Stevens Act (*Federal Register* 67, No. 12) require all fishery management councils to amend their fishery management plans to describe and identify EFH for each managed fishery. Amendment 14 to the Pacific Coast Salmon Plan (1997)[2] covers EFH for all fisheries under NMFS jurisdiction that would potentially be affected by the proposed action. EFH includes all streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon. Activities upstream of impassable barriers are subject to consultation provisions of the Magnuson-Stevens Act when they would affect EFH downstream of those barriers.[3]

Under Section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Whenever possible, NMFS uses existing interagency coordination processes to fulfill EFH consultations with federal agencies. Evaluation of project impacts on EFH is included in the Section 4.4 of this EIR/EIS.

[2] The Pacific Fishery Management Council (PFMC) manages Pacific Coast salmon fisheries. Amendment 14 contains Appendix A, which identifies EFH by species and rivers from Alaska to California. The Carmel River is listed and is considered to have historically provided habitat for coho salmon (Brown and Moyle 1991).

[3] The Act does not apply if actions do not affect downstream EFH; in any case SCD is not upstream of such a barrier.

Other Federal Regulations Affecting Biological Resources

Migratory Bird Treaty Act (16 USC §703-711; 50 CFR Subchapter B)

This Act includes provisions for protection of migratory birds, including basic prohibitions against any take not authorized by the Act. The Act is enforced by the USFWS.

Rivers and Harbors Act (§10; 33 USC §201 et seq.)

This Act protects waters of the United States and is administered by the USACE.

Clean Water Act of 1977 (33 USC §1251-1376; 30 CFR §330.5[a]26)

These sections provide for the protection of wetlands and are administered by the USACE.

Executive Order 11990 — Protection of Wetlands (May 24, 1977)

This order provides for the protection of wetlands and is enforced by the USACE.

Cultural Resources

Preserving cultural resources allows Americans to have an understanding and appreciation of their origins and history. A cultural resource is an object, structure, building, site or district that provides irreplaceable evidence of natural or human history of national, state or local significance. Cultural resources include National Landmarks, archeological sites, and properties listed (or eligible for listing) on the National Register of Historic Places. Regulations established for the management of cultural resources include:

- Antiquities Act of 1906 (16 U.S.C. 431-433).
- Historic Sites Act of 1935 (16 U.S.C. 461-467).
- Section 106 of the NHPA of 1966 (16 U.S.C. 470 et seq.), as amended.
- Archaeological Data Preservation Act (ADPA) of 1974 (16 U.S.C. 469 a-c).
- American Religious Freedom Act of 1978.
- EO 13007 Indian Sacred Sites.

The USACE has initiated the Section 106 consultation process for this project with the State Historic Preservation Officer SHPO for California, the ADPA, and the consulting and interested parties (see Section 4.10 for further detail).

1.5.2 STATE REQUIREMENTS

Annual MOA on Carmel River Flows (CDFG, MPWMD, CAW)

CDFG has a duty to protect fish and wildlife resources of the state of California. The MPWMD, pursuant to its rules and regulations, establishes a quarterly water supply strategy and budget for the Monterey Peninsula. CAW supplies water to the Monterey Peninsula and must comply with State Water Resources Control Board (SWRCB) Order 95-10, as amended. The CDFG, MPWMD, and CAW have a mutual objective of managing surface flow in the Carmel River, and to the extent feasible, maximizing flow from June through December each year. Consequently, CDFG, MPWMD, and CAW enter into an annual SCD MOA providing for flow releases based on actual and projected Carmel Valley rainfall, runoff, storage, and production needs, with the intent of enhancing fishery habitats in the lower Carmel River. Enhancement of fishery habitats is achieved by establishing a minimum storage pool at Los Padres Reservoir and establishing a rate and schedule for flows downstream of Los Padres and San Clemente dams. Flow rates vary depending on seasonal rainfall, and typically range between 3 and 8.5 cubic feet per second between May and December below the SCD. In 2004, minimum pool at Los Padres was set at elevation 980', or 91 acre feet of storage; the minimum pool at SCD was set at elevation 515', or 71 acre feet of storage. Releases were scheduled to maintain between 5 and 9 cfs in the lower Carmel River, depending upon the month. The Annual SCD MOA also incorporates certain provisions of Order 95-10, as amended, which limit CAW's diversions from SCD and limit CAW's operations of certain of its wells in the Carmel Valley Aquifer during the dry season.

Streambed Alteration Agreement (SAA, CDFG)

Sections 1600-1616 of the California Fish and Game Code require project proponents to submit to CDFG a Notification of Lake or Streambed Alteration for any project that may “substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.” Upon approval CDFG will issue a Streambed Alteration Agreement (SAA). As a state agency, CDFG requires that a CEQA document be completed prior to issuing an SAA. This EIR/EIS provides the required CEQA compliance for this project. In addition to completing the Notification of Lake or Streambed Alteration and verification of complete CEQA documentation, project applicants must submit a fee to CDFG in order to receive the SAA.

Several different SAAs will be necessary for this project because the work involves stream crossings at more than one location and construction activity over multiple years. When project activities are similar each year, one SAA can be developed to cover the project term. For the San Clemente Dam Seismic Safety Project, the types of project actions could vary substantially from the first year to the last, consequently, separate SAAs may be required for the various activities such as construction of a

bridge across Tularcitos Creek, reconstruction of the Old Carmel River Dam Bridge (OCRB), and dewatering the plunge pool.

All SAAs define the seasonal work windows and protection measures required by CDFG, and Lake or Stream Alteration Program staff typically makes site visits prior to releasing an SAA.

California Fish and Game Code

The CDFG enforces the California Fish and Game Code. The California Species Preservation Act of 1970 (Code sections 900-903) provides for the protection and enhancement of the birds, mammals, fish, amphibians, and reptiles of California and prohibits the taking or possessing of any bird egg or nest. Sections 3511 and 5050 prohibit the taking or possessing of birds and reptiles listed as “fully protected”. The Native Plant Protection Act of 1977 (Code sections 1900 et seq.) lists state-designated rare and endangered plants and provides specific protection measures for identified populations. Sections 1930-1993 provide for the Significant Natural Areas program and database.

CESA, Code §2050-2098, 1984) includes provisions for the protection and management of species listed as endangered or threatened, or designated as candidates for such listing. The act requires consultation “to ensure that any action authorized by a state lead agency is not likely to jeopardize the continued existence of any endangered or threatened species or results in the destruction or adverse modification of habitat essential to the continued existence of the species” (§2090). Plants of California declared to be endangered, threatened, or rare are listed in 14 CCR §670.2. Animals of California declared to be endangered, threatened, or rare are listed in 14 CCR §670.5.

Air Quality Plans

As required by the California CAA and Amendments (Health and Safety Code (HSC) Section 40910 et seq.) and the Federal CAA and Amendments (42 U.S.C. Section 7401 et seq.) the MBUAPCD is responsible for air monitoring, permitting, enforcement, long-range air quality planning, regulatory development, education and public information activities related to air pollution. California Health and Safety Code Sections 39002, et seq. and 40000, et seq. both require local districts to be the primary enforcement mechanism for air pollution control. The MBUAPCD promulgates and administers rules and regulations for the implementation and enforcement of the attainment and maintenance of federal and state ambient air standards.

Relevant to this project, MBUAPCD administers state and federal management plans, oversees general conformity, and enforces the statewide Portable Equipment Registration Program (PERP). The San Clemente Dam Seismic Safety Project must comply with:

- The 2004 AQMP for the Monterey Bay Region, which addresses attainment of state ozone standard and is updated every three years.

- The 1997 FMP, which addresses non-attainment areas for state and federal ambient air quality standards, including attainment of the Particulate Matter (PM_{10}) standard.

- The General Conformity Rule, which was adopted to comply with the CAA Section 176(c) which prohibits federal entities from taking actions (e.g., funding, licensing, permitting, or approving projects) in National Ambient Air Quality Standards (NAAQS) nonattainment or maintenance areas which do not conform to the State Implementation Plan (SIP) for the attainment and maintenance of NAAQS pursuant to Section 110(a) of the Clean Air Act.

- The 1997 Statewide PERP, which establishes a uniform program to regulate portable engines and portable engine-driven equipment units. Once registered in the Program, engines and equipment units can operate throughout the State of California without the need to get individual permits from local air districts. Districts are preempted from permitting, registering, or regulating portable engines and portable equipment units registered with the Air Resources Board (ARB). However, local air districts are responsible for enforcing the program.

The San Clemente Dam Seismic Safety Project may affect air quality, primarily during construction and sediment management operations. Potential air impacts are discussed in Section 4.3, Air Quality, in Chapter 4.0 of this EIR/EIS. For general conformity, the Project will need to show that it does not conflict with the AQMP or the FMP, and that all non-mobile source equipment used complies with PERP.

Regulation of Water Utilities

The CPUC is charged with the regulation of the rates and service of investor-owned utilities (including all investor-owned water utilities, such as CAW) in California. The CPUC has several divisions, including its water division. The CPUC adopts Rules of Practice and Procedure and issues General Orders regulating various aspects of rates, services, facilities, and the safety and financial practices of utilities. Water utilities are under a mandate to serve customers within their authorized service areas. The CPUC routinely examines the adequacy of a water utility's water production, treatment, storage, and distribution systems. All major projects, such as the San Clemente Dam Seismic Safety Project, must be approved by the CPUC.

Greenhouse Gas Emissions

The California Air Resources Board (CARB), the California EPA, and other governmental agencies with jurisdiction have not yet developed guidelines on how to prepare a CEQA impact assessment for a project's greenhouse gas (GHG) contribution to Global Climate Change (GCC). The State Legislature enacted and the Governor signed Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, which charged CARB to develop regulations on how the State would address GCC. AB 32 focuses on reducing GHG in California. AB 32 requires CARB, the state agency charged with regulating statewide air quality, to adopt rules and regulations that would achieve greenhouse gas emissions equivalent to statewide levels in 1990 by 2020. SB 97

(2007) requires the State of California Governor's Office of Planning and Research to prepare "guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions" required by CEQA by July 2009. These guidelines, in turn, will be certified and adopted by the Resources Agency by January 2010.

1.5.3 LOCAL REQUIREMENTS

Monterey Peninsula Water Management District (MPWMD)

The MPWMD allocates water resources for the Monterey Peninsula Water Resources System and monitors the environmental effects of water production in the Carmel River watershed. MPWMD also issues River Access and River Work Permits.

The MPWMD Water Allocation Program sets annual water allocations for water resources within MPWMD's jurisdiction, including allocations for CAW. All water distribution systems within MPWMD's jurisdiction, including the CAW system, require a permit from MPWMD. As specified in the MPWMD Rules and Regulations (Rule 20 (B)), a change in CAW's distribution system (such as alternatives that would relocate CAW's point of diversion) may require a permit from MPWMD.

The MPWMD has developed a Mitigation Plan for the MPWMD Water Allocation Program. The Mitigation Plan is renewed on an annual basis, and focuses on fisheries, riparian vegetation and wildlife, the Carmel River lagoon, special-status species, and aesthetics. Activities undertaken under the Plan include irrigation and erosion control, fishery enhancement, flow releases, water quality monitoring, municipal water demand reduction, and regulating activities in the river corridor.

Monterey County Policies and Regulations

Monterey County has adopted policies and regulations managing forest resources. Under the provisions of Title 16, Chapter 16.60, Monterey County Code, no oak, madrone, or redwood tree six inches or greater in diameter (at two feet above ground level) shall be removed in the Carmel Valley Master Plan (CVMP) area without a tree removal permit. Chapter 16.60 also provides that no landmark oak tree shall be removed in any area except as approved by the Director of Planning and Building Inspection. Landmark oak trees are defined as trees 24 inches or greater in diameter (at two feet above ground level), or trees that are visually significant, historically significant, or exemplary of their species. Replacement of oak trees removed by project actions at a 1: 1 ratio is required under Chapter 16.60.

Monterey County Land Use Plans

The Monterey Country Comprehensive Plan and Local Area Plans (such as the Cachagua area plan) set planning and development policy for areas throughout the County, including those areas in which the San Clemente Dam Seismic Safety Project will be developed. The Monterey County Planning Department may require permits for the following activities:

- Removal of more than 3 oaks or any other protected trees for development or improvement of road or other project features would require a County permit.
- Development of any slopes over 30 percent would require Use Permits from Planning and Building Inspection.
- An encroachment permit would be required from County Public Works Department to access existing roads with new access points or improvements in existing rights-of-way.
- Grading permits would be required for the concrete batch plant, installation of the crane, and development of new and existing access roads.

1.6 PROJECT HISTORY

In 1980, DSOD requested that CAW evaluate the ability of the Dam to safely pass the PMF and withstand the MCE. Woodward-Clyde Consultants (WCC) was retained by CAW and completed an initial report in 1982. Although this preliminary report concluded that the Dam had adequate strength to resist the loadings imposed by either of these events, DSOD requested additional analysis, which was conducted by WCC and submitted by CAW. In a letter dated May 9, 1986, DSOD concluded that the proposed MCE and the response spectra were satisfactory; however, DSOD requested a more detailed analysis.

During the 1980s, MPWMD pursued the construction of a new dam on the Carmel River and investigated the San Clemente Dam site (referred to as the "New San Clemente Project") as an alternative location for a 29,000 acre-foot reservoir. Because the new reservoir, if constructed, would have inundated the existing dam and reservoir, DSOD agreed to defer their request for a more detailed analysis of the existing SCD. However, in February 1989, MPWMD shifted its focus from the New San Clemente Project to a dam site downstream of Los Padres Dam (LPD), which was believed to be a less environmentally damaging, more practicable alternative. When that project failed to proceed, DSOD renewed its request to CAW for completing an updated engineering analysis of the existing dam's stability.

In 1990, CAW retained an engineer to perform the required seismic and flood stability evaluations to comply with DSOD's request. The *Seismic and Flood Stability Evaluation, San Clemente Dam* report (WCC 1992) confirmed that with full storage, the Dam may not be stable under the MCE and the downstream abutment area would be susceptible to excessive erosion under PMF conditions. The existing spillway has a discharge capacity of about 20,800 cubic feet per second (cfs) at the Dam crest elevation. The PMF is estimated to be approximately 81,000 cfs, which would overtop the Dam by approximately 14 feet. Based on these findings (circa 1992), the DSOD required that SCD be brought into compliance with current seismic safety standards, to withstand loading from a MCE on the Tularcitos Fault and safely pass the PMF (these two events are not expected to occur simultaneously). DSOD also restricted use of flashboards.

At that time, an initial set of alternatives for repair of SCD was developed. This set of alternatives included:

- Strengthen the Dam;
- Lower the Dam crest (notching);
- Breach the Dam/crest at 490 feet (dam removal);
- Strengthen the Dam and raise the crest 10 feet;
- Strengthen the Dam and raise the crest 20 feet; and
- Strengthen the Dam, raise the crest 20 feet, and dredge the reservoir.

A 1993 report concluded that the alternatives would result in significant environmental impacts. Subsequently, CAW further defined the project objectives and identified additional alternatives for further evaluation.

Additional dam stress analyses were performed (WCC 1993), evaluating various reservoir levels, failure modes, and dam overtopping scenarios. These preliminary conceptual design alternatives were based on a determination that the Dam would have to be notched to elevation 509 (16 feet below the existing spillway elevation) for seismic stability and to elevation 506 to safely pass the PMF. The report noted that the stresses were greatly reduced when the superstructure was removed. DSOD accepted the 1993 report and agreed upon the design alternatives and CAW proceeded with preliminary engineering feasibility studies.

The engineering analysis, entitled *Structural Improvement of San Clemente Dam, Preliminary Feasibility Study* (1995), presented eight alternatives for dam reinforcement. Six of these were evaluated from an engineering and environmental impact perspective:

- Notching
- Post-Tensioning Tendons
- Arch Beams
- Arch Beams with Buttress Supports
- Downstream Thickening
- Roller-Compacted Concrete (RCC) Dam

The "No Action" alternative and a dam armoring alternative were also evaluated, but were found to be ineffective and dismissed prior to the environmental evaluation. The report compared all of the alternatives and identified dam thickening as the project

alternative that best met project objectives at an acceptable level of environmental impact. In August 1995, DSOD accepted the *Preliminary Feasibility Study* and confirmed that further study of the concept of dam thickening under CEQA was warranted. A final report was submitted to DSOD in September 1996.

In early 1996, CAW contracted with Moffat & Nichol Engineers to determine the feasibility of dredging San Clemente reservoir and potential sites for disposal or end-use of the dredged material. In September 1996 Moffat & Nichol Engineers submitted its report entitled *San Clemente Reservoir Dredging Feasibility Study*.

WCC was retained to perform preliminary project design for evaluation in a CEQA EIR, addressing access, retrofit design and rendering, dam break analysis, construction materials report and concrete production plan. In January 1997, WCC submitted to DSOD a draft engineering report entitled *Design Memorandum: Structural Improvements San Clemente Dam*. That report summarized the criteria used in the preliminary design of the proposed downstream thickening project; design alternatives for construction access from Carmel Valley Road to the Carmel Valley Filter Plant; the result of engineering analysis performed to verify the appropriateness of the design; mechanical and design considerations; and construction issues and site conditions.

In March 1997, DSOD accepted the MCE design criteria and other information prepared under the preliminary design scope of work (with some additional questions regarding the need for dowels). A Draft EIR (DEIR) for the SCD Seismic Retrofit Project was prepared in December 1998 and circulated for public review through February 1999. The DEIR analyzed dam removal, notching, and mitigated retrofit with sediment management alternatives. Comments on the DEIR requested new and expanded information including additional analysis of existing and new dam notching and removal alternatives, access alternatives, additional traffic analysis, as well as analysis of sediment releases from SCD, flushing flows, and other potential changes associated with dam removal.

The substantial amount of new information led to the preparation of a Recirculated Draft EIR (RDEIR) prepared by Denise Duffy & Associates, which was issued in 2000. The RDEIR responded to NMFS' desire to both meet dam safety objectives and restore natural fish passage, bedload transport and channel and canyon slopes and associated habitat occupied by the reservoir. The alternatives section of the RDEIR contained more detailed sediment management options to prevent the adverse effects of uncontrolled sediment releases.

Comments received on the RDEIR requested that dam removal be evaluated in more depth as an alternative. NMFS and others commenting on the RDEIR requested further analysis on hydrology and sediment transport in the Carmel River. Other comments requested further consideration of the Dam removal alternative, sediment management alternatives, and alternative access routes.

As a result of these comments, significant additional studies, funded by CAW, were conducted in cooperation with NMFS, USFWS, CDFG, MPWMD, DWR, and others to evaluate a wide range of sediment disposal options, including sediment releases to the Carmel River under various flow scenarios and associated with a range of notching and dam removal alternatives. An interagency working group spent considerable time and effort to explore potentially feasible means of notching the Dam or removing it with less adverse effects.

Since the release of the December 1998 DEIR, the reservoir has nearly filled with sediment, leading to concerns about fisheries/aquatic and flood plain impacts associated with uncontrolled releases. In 2003 the DSOD required modifications to SCD to meet interim dam safety requirements, including an interim drawdown (see Section 3.6). An Interagency Group identified a technical approach that could provide for safe controlled flow releases with acceptable environmental effects. Consultation under the Federal ESA for the interim drawdown was conducted with USFWS and NMFS leading to issuance of BOs under Section 7 of the ESA by USFWS and NMFS.

1.7 SCOPING, IDENTIFICATION OF ISSUES, AND PUBLIC REVIEW

NEPA procedures require public scoping for an EIS. CEQA provides for a response to the Notice of Preparation (NOP) by State Responsible and Trustee Agencies, and acknowledges the necessity for scoping when an EIR/EIS is prepared jointly with a federal agency.

DWR initially determined the need to prepare an EIR under CEQA in 1997, based on a preliminary evaluation of potential significant impacts of project construction and operation. An NOP with a 30-day review period was issued by DWR on March 25, 1997, and distributed to interested parties and organizations. A revised NOP for the EIR/EIS (SCH #2005091148) was filed on September 28, 2005 with the State of California Governor's Office of Planning and Research State Clearinghouse and was distributed by certified mail to all federal permitting agencies and California Responsible Agencies and Trustee Agencies (see Appendix A).

The USACE has determined that the deposition of fill and other project impacts may have a significant impact on the quality of the human environment and requires preparation of an EIS under NEPA. A Notice of Intent (NOI) for the SCD Seismic Retrofit Project was published by the USACE in the Federal Register on September 30, 2004 (Appendix B). The close of the comment period was November 30, 2004.

Public and agency scoping meetings for the EIR/EIS were held in Monterey, California on November 4 and November 9, 2004 to solicit input on the issues, impacts and alternatives that should be evaluated in the EIR/EIS. A scoping announcement and comment form was sent to public and agency mailing lists of more than 1,000 persons. The mailings were sent to local Monterey area residents, including participants in prior CEQA-mandated processes. A press release was sent to local print and radio news media, as well as other outlets and a flyer was prepared and posted throughout the

Monterey area. A project information package was developed and made available at both the public and agency scoping meetings in November 2004. Earlier scoping meetings had been held in April 1997 as part of the CEQA process for the 1998 DEIR and 2000 RDEIR.

Scoping comments were received at the public and agency meetings, and on comment forms made available at the meetings and sent to the public and agency mailing lists. Comments also were received on a project comment website. Letters containing comments were also received. A total of 197 comment responses were received. In addition, 235 comments that had been received on the RDEIR published in 2000 were taken into consideration. These comments were summarized in a detailed Scoping Report published January 20, 2005, and were considered by the Lead and Cooperating Agencies in determining the scope of the EIR/EIS. The majority of comments were made in the following issue areas:

- Aesthetics
- Air quality and noise
- Fish and aquatic biology
- Hydrology
- Project and alternatives
- Public health and safety
- Ratepayer and economic impacts
- Sediment transport, removal and disposal
- Terrestrial biology
- Traffic, safety, and access
- Water quality
- Water resources
- Wetlands

The Draft EIR/EIS was circulated for public comment from April 21, 2006 through July 3, 2006. A Notice of Availability was published in the Federal Register on May 19, 2006 and a Notice of Completion for the EIR was issued through the California State Clearinghouse on April 21, 2006. A Public Hearing on the Draft EIR/EIS was held in Carmel Valley on May 23, 2006. More than 650 comments were received on the Draft EIR/EIS. Appendices C and D contain the written comments received and the transcript

of the Public Hearing. The Final EIR/EIS has been rewritten to incorporate responses to these comments whenever the comment could best be addressed by modifying the document itself. Additional information is provided in the Final EIR/EIS which clarifies and amplifies the information included in the Draft EIR/EIS. Responses to comments are provided in Appendix E. The responses to all comments are arranged by subject area. Appendix E also provides reference to the sections of this Final EIR/EIS that have been modified in response to comments.

1.8 TERMINOLOGY USED IN THE EIR/EIS

The EIR/EIS uses the following terminology consistent with CEQA Guidelines to denote the significance of potential environmental impacts.

- A “less than significant” impact or an impact that is “not significant” would cause no substantial adverse changes in the environment; no mitigation is needed.
- A “significant” impact could or would cause substantial physical changes in the environment. Mitigation is recommended to reduce the impact to a less-than-significant level.
- A “significant and unavoidable” impact is one that could or would cause a substantial adverse change in the environment that cannot be avoided if the project is implemented. Mitigation may be recommended, but would not reduce the impact to a less-than-significant level.

Impacts for each resource or issue are analyzed and evaluated based on the following factors:

- Extent — considers whether the impact would be local or regional in nature;
- Duration — considers whether the impact is short-term (typically construction-related) or long-term (typically described in terms of years);
- Seasonality/Timing — considers variation in impact based on timing of effects (e.g., for steelhead trout and California red-legged frog);
- Intensity — considers whether the impact would be negligible (imperceptible or not detectable); minor (slightly perceptible and generally localized); moderate (apparent and having the potential to become larger); or major (substantial, highly noticeable and possibly permanent);
- Type — considers whether the impact would be beneficial or adverse.

1.9 ORGANIZATION OF THE EIR/EIS

The EIR/EIS is organized into six chapters which conform to the required contents of an EIR established in CEQA (Article 9, Contents of Environmental Impact Reports) and the recommended format of an EIS under NEPA (40 CFR 1502.10). Chapter 2.0 provides a

summary of the Proponent's Proposed Project and alternatives, and their potential for significant impacts and recommended mitigation measures. Chapter 3.0 provides a description of each component of the Proponent's Proposed Project and each major alternative, including planning, construction, and operations.

Chapter 4.0 presents the environmental setting, consequences and recommended mitigation measures. It is organized topically, following the major categories of potential environmental impact associated with the Proponent's Proposed Project and alternatives. Each topical section describes the local and regional setting and the known environmental impacts of the project. This Draft EIR/EIS considers the full range of potential environmental impact issues. Each issue has been analyzed against established standards of significance where applicable. Mitigation measures are recommended for each significant impact.

Chapter 5.0 discusses unavoidable adverse impacts, irreversible or irretrievable commitments of environmental resources, growth inducement, and cumulative impacts. It also considers the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. Chapter 6.0 lists the persons who prepared the report, agencies and persons contacted, and a bibliography. A list of acronyms appears in the Table of Contents.

1.10 EIR/EIS PROCESS

The EIR/EIS is intended for use by the lead agencies and the cooperating, responsible, and trustee agencies that may have permit or review authority over the project. A Notice of Availability (NOA) of the Draft EIR/EIS was published in the *Federal Register* on May 19, 2006 and a Notice of Completion for the Draft EIR was issued through the California State Clearinghouse on April 21, 2006. The Draft EIR/EIS was circulated for public comment from April 21, 2006 through July 3, 2006. Comments received by the lead agencies on the Draft EIR/EIS were reviewed and responses to comments have been addressed in this Final EIR/EIS. A Notice of Availability of the Final EIR/EIS will be published in the *Federal Register*, and no federal decision will be made until 30 days after the date of publication.

Prior to approving a project, DWR must certify that the final EIR/EIS has been completed in compliance with CEQA, that it has reviewed and considered the information in the Final EIR/EIS, and that the Final EIR/EIS reflects its independent judgment and analysis.. Once DWR approves a project, it will file a Notice of Determination (NOD) with the State Clearinghouse. Under NEPA, the USACE will issue a ROD explaining its decision and why it has taken the chosen course of action. The ROD will be prepared by the USACE and cannot be signed until at least 30 days after publication of the Final EIR/EIS. The ROD for this EIS/EIR will be signed at the completion of federal permitting associated with the USACE decision (including ESA Section 7 consultation, NHPA Section 106, and CAA Section 404). The ROD is part of the public record and will be made available upon request from the USACE.

It is not the purpose of an EIR/EIS to recommend either approval or denial of a project. NEPA requires each federal agency to adopt procedures to ensure that its decisions consider environmental effects, and the ROD is to be used in the federal decision. Although the EIR/EIS does not control the lead agencies' ultimate decisions on the project, the Lead Agencies must consider information in the EIR/EIS during the approval process. Under NEPA, no alternative may be selected unless it has been adequately discussed and evaluated in an EIS (or an environmental assessment [EA]). Under CEQA, DWR must respond to each significant impact identified in the EIR. If significant, adverse environmental impacts are identified in the EIR, approval of the project under CEQA must be accompanied by written findings, determining the following, as appropriate:

- Changes or alterations have been required in, or incorporated into, such project that mitigate or avoid the significant environmental effects thereof as identified in the completed EIR.

- Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency.

- Specific economic, social or other considerations make infeasible the mitigation measures or project alternatives identified in the EIR.

If mitigation measures are to be made a condition of the approval of the project, a mitigation monitoring plan/program must be adopted before the project is approved. CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve a project. When an agency approves a project that will result in significant and unavoidable impacts, it must make a Statement of Overriding Considerations. The NOD filed for the project must include information on whether the agency certified the EIR and made the findings, if required, under CEQA and whether it adopted a mitigation monitoring plan/program and/or a Statement of Overriding Considerations.

CHAPTER 2.0

SUMMARY

2.0 SUMMARY

2.1 PROPONENT'S PROPOSED PROJECT AND MAJOR ALTERNATIVES

No "preferred alternative" has been designated by the lead agencies. The Proponent's Proposed Project is dam strengthening (under the National Environmental Protection Act [NEPA], this is termed the "proposed action"). The following alternatives are considered in this EIR/EIS:

- Alternative 1: Dam Notching with Partial Sediment Removal
- Alternative 2: Dam Removal with Total Sediment Removal
- Alternative 3: Carmel River Reroute and Dam Removal with in-place Sediment Stabilization
- Alternative 4: No Project

The Proponent's Proposed Project and its action alternatives (Alternatives 1, 2, and 3) include site access and sediment removal, fish passage, and water diversion. The Proponent's Proposed Project and Alternatives 1, 2, and 3 meet the requirement of increasing the safety of San Clemente Dam (SCD) to meet design criteria for withstanding a Maximum Credible Earthquake (MCE) and passing a Probable Maximum Flood (PMF). Alternative 4 does not meet dam safety requirements.

2.1.1 PROPONENT'S PROPOSED PROJECT: DAM STRENGTHENING

The Proponent's Proposed Project is to strengthen the existing SCD, which is owned and operated by the Coastal Division of the California American Water Company (CAW). The proposed improvements are intended to comply with California Department of Water Resources (DWR), Division of Safety of Dams (DSOD) requirements to address safety deficiencies and eliminate the risk of failure during a MCE or a PMF event.

The Project Area is within the upper reaches of the Carmel River in an unincorporated area of Monterey County. SCD sits at the confluence of the Carmel River and San Clemente Creek (River Mile [RM] 18.5), approximately 15 miles southeast of the city of Carmel-by-the-Sea and 3.7 miles southeast of the Carmel Valley Village. SCD impounds a reservoir and serves as a surface water diversion. Another impoundment, at Los Padres Dam (LPD), is approximately five miles upstream at RM 23.5 on the Carmel River.

The Proponent's Proposed Project would eliminate safety risks by thickening the downstream face of the Dam with concrete, strengthening the right abutment near the dam crest, modifying the spillway and dam crest to increase effective spillway width and armoring the abutments with gunite to prevent erosion. A concrete batch plant would be

installed onsite to manufacture the required concrete. A tower crane would be staged at the base of the Dam to move construction materials from the batch plant to the Dam face and fish ladder. The electrical system at the Dam would be improved. During construction, the Carmel River and San Clemente Creek would be diverted around the construction area, the plunge pool at the base of the Dam would be dewatered, and a fish rescue and relocation operation would be operated during construction years. The plunge pool downstream of the Dam would be completely drained prior to dam thickening to allow access for construction workers and machinery for thickening operations and new fish ladder construction. The existing fish ladder allows steelhead trout (listed under the federal Endangered Species Act [ESA] as threatened) to ascend 68 feet to the reservoir and watershed above the Dam. The Proponent's Proposed Project includes a new fish ladder that would comply with existing criteria for fish passage promulgated by the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (CDFG). A sluice gate would be installed to manage sediment releases, to maintain upstream passage to the fish ladder exit and to maintain water flow into the CAW diversion pipeline. Sediment management following the Sediment Operations and Management Plan (SOMP) would be required to maintain the existing surface water supply intake and to ensure fish passage through the accumulated sediment. In addition, a notch would be cut into the Old Carmel River Dam (OCRD), which is about 1800-feet downstream of SCD, in order to provide adequate fish passage.

A new access from Carmel Valley Road (the "Tularcitos Access Route") would be constructed to bypass the portion of San Clemente Drive which goes through the Sleepy Hollow community by crossing Tularcitos Creek and connecting Carmel Valley Road to San Clemente Drive near CAW's Carmel Valley Filter Plant (CVFP). In addition, the Old Carmel River Dam Bridge (OCRB) and the access road from the CVFP to the Dam would be improved. The existing access road along the east side of the Carmel River, between the OCRD and the base of San Clemente would be rebuilt. The bypassed portion of San Clemente Drive would be used for up to eight months the first year of construction until the Tularcitos Access Route is completed.

The dam thickening alternative would take an estimated four to five years to complete, including environmental review, permitting, design, and infrastructure improvements.

2.1.2 ALTERNATIVE 1: DAM NOTCHING

This alternative would eliminate safety risks by notching the Dam to the approximate elevation of 506 feet in the area of the existing spillway bays. The gates, piers and walkway at the top of the Dam would be removed. This alternative would reduce mass sufficiently to avoid catastrophic failure of the Dam during a MCE event. Notching to an elevation of 506 feet also would be sufficient to ensure dam safety during a PMF. A new facility to divert water would be constructed upstream of the Dam to replace the existing surface water diversion at SCD. The electrical system at the Dam would be upgraded to support a conveyor sediment transport system. During construction, the Carmel River

and San Clemente Creek would be diverted around the construction area, the plunge pool at the base of the Dam would be dewatered, and a fish rescue and relocation operation would be operated during construction years. The plunge pool downstream of the Dam would be completely drained prior to dam notching to allow access for construction workers and machinery for notching operations and new fish ladder construction.

Sediment in the reservoir would be removed down to the level of the notch. A new Carmel River channel and San Clemente Creek channel would be reconstructed in a geomorphically stable configuration in the excavated sediments in the reservoir's inundation zone. Approximately 1.5 million cubic yards (cy) (930 acre-feet [AF]) of accumulated sediment would be removed over two seasons by excavation with heavy equipment. Sediment would be transported from the reservoir via a conveyor belt system to a disposal area east of San Clemente Reservoir. A new facility to divert water would be constructed upstream of the Dam to replace the existing surface water diversion at San Clemente. The existing fish ladder would be removed and a new ladder would be designed and built to accommodate the lowered dam elevation and to comply with existing criteria for fish passage promulgated by NMFS and CDFG. A sluice gate would be installed to enable managed sediment releases to maintain upstream passage from the fish ladder exit to upstream channels. Sediment management following the SOMP would be required to ensure fish passage through the accumulated sediment. In addition a notch would be cut into OCRD, which is about 1800-feet downstream of SCD, in order to provide adequate fish passage.

A design for sediment transport and disposal would be implemented that avoids sediment transport by truck through any populated area. Existing access roads (including San Clemente Drive) with minor improvements would be used to reach the base of the Dam for construction activities at and below the Dam. The OCRB and the access road from the CVFP to the Dam would be improved and the existing access road along the east side of the Carmel River, between OCRD and the base of SCD, would be rebuilt. An existing 4WD road (the Jeep Trail) would be improved to connect Cachagua Road with the sediment disposal site and to the reservoir area above the Dam. This route would be used only to move construction equipment and materials necessary to construct the road, prepare the sediment disposal site, connect the sediment disposal site to the Dam by conveyor belt and maintain the conveyor belt. All sediment transport would occur via conveyor belt from the Dam to the disposal site. No sediment would be hauled by truck over any roads. The stream channels through the upstream sediment plain would be stabilized.

The dam notching alternative would take an estimated six years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, dam notching and upstream channel reconstruction through the sediment plain.

2.1.3 ALTERNATIVE 2: DAM REMOVAL

This alternative would permanently eliminate safety concerns through the removal of the Dam. The Dam would be demolished and removed from the site. A new facility to divert water would be constructed upstream of the Dam to replace the existing surface water diversion at San Clemente. The electrical system at the Dam would be upgraded to support a conveyor sediment transport system.

During construction, the Carmel River and San Clemente Creek would be diverted around the construction area, the plunge pool at the base of the Dam would be dewatered, and a fish rescue and relocation operation would be operated during construction years. The plunge pool downstream of the Dam would be completely drained prior to dam removal to allow access for demolition.

Approximately 2.4 million cy (1,555 AF) of accumulated sediment would be removed over three seasons by excavation with heavy equipment. Sediment would be transported from the reservoir via a conveyor belt system to a disposal area east of San Clemente Reservoir. The historic Carmel River channel and San Clemente Creek exposed by sediment excavation in the reservoir's inundation zone would be reconstructed in their historical valleys.

A design for sediment transport and disposal would be implemented that avoids sediment transport by truck through any populated area. Existing access roads (including San Clemente Drive) with minor improvements would be used to reach the base of the Dam for construction activities at and below the Dam. The OCRB and the access road from the CVFP to the Dam would be improved and the existing access road along the east side of the Carmel River, between OCRD and the base of SCD, would be rebuilt. An existing 4WD road (the Jeep Trail) would be improved to connect Cachagua Road with the sediment disposal site, and to the reservoir area above the Dam. This route would be used only to move construction equipment and materials necessary to construct the road, prepare the sediment disposal site, and connect the sediment disposal site to the Dam by conveyor belt. All sediment transport would occur via conveyor belt from the Dam to the disposal site. No sediment would be hauled by truck over any roads.

The existing dam and fish ladder would be demolished and removed from the site. A notch would be cut into OCRD, which is about 1800-feet downstream of SCD, in order to provide adequate fish passage.

The dam removal alternative would take an estimated seven years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, dam demolition, and creek channel reconstruction.

2.1.4 ALTERNATIVE 3: CARMEL RIVER REROUTE AND DAM REMOVAL

This alternative would permanently eliminate safety concerns through the removal of the Dam. The Dam and fish ladder would be demolished and rubble used on site to stabilize the sediment pile. A new facility to divert water would be constructed upstream of the Dam to replace the existing surface water diversion at San Clemente. The electrical system at the Dam would be improved.

Approximately 380,000 cy (235 AF) of accumulated sediment behind the Dam on the San Clemente Creek arm of the reservoir would be relocated to the Carmel River arm by excavation with heavy earthmoving equipment. A portion of the Carmel River would be permanently bypassed by excavating a 450-foot-long channel through the ridge that separates the Carmel River and San Clemente Creek, approximately 3000 feet upstream of the Dam. The bypassed portion of the Carmel River would be used as a sediment disposal site for the sediment accumulated in the Carmel River and excavated from the San Clemente Creek arm. The spoils from the bypass channel construction (235,000 cy or 145 AF) would be used for construction of a diversion dike at the upstream end of the bypassed reservoir arm. The sediments at the downstream end of the bypassed reservoir arm would be stabilized and protected from erosion.

During construction, the Carmel River and San Clemente Creek would be diverted around the construction area, the plunge pool at the base of the Dam would be dewatered, and a fish rescue and relocation operation would be operated during construction years. The plunge pool downstream of the Dam would be completely drained prior to dam removal to allow access for demolition.

The Carmel River would be reconstructed through the historic inundation zone in the San Clemente Creek arm from the exit of the bypass channel to the dam site. The San Clemente Creek channel would be reconstructed through its historic inundation zone from the exit of the diversion channel to the dam site. Impacts to the river channel through the historic inundation zone would be mitigated. The existing fish ladder would be demolished and removed from the site. A notch would be cut into OCRD, which is about 1,800 feet downstream of SCD, in order to provide adequate fish passage.

A design for sediment transport and disposal would be implemented that avoids sediment transport by truck through any populated area. Existing access roads (including San Clemente Drive) with minor improvements would be used to reach the base of the Dam for construction activities at and below the Dam. The OCRB and the access road from the CVFP to the Dam would be improved and the existing access road along the east side of the Carmel River, between OCRD and the base of SCD, would be rebuilt. An existing 4WD road (the Jeep Trail) would be improved to connect Cachagua Road with the reservoir.

This project is expected to take five years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, bypass channel

excavation, diversion dike construction, dam demolition, and creek channel reconstruction.

2.1.5 ALTERNATIVE 4: NO PROJECT

Under this alternative, the Dam would be left in place with all its existing facilities. A new fish ladder would not be constructed, OCRD would not be notched, and the sediment would be left in place behind the Dam. The reservoir would continue to accumulate sediment at an average rate of about 16.5 AF per year. Minor sediment removal may occur to allow the Dam to maintain the existing surface water supply intake serving the upper Carmel Valley Village area. The existing drawdown ports in the Dam and the existing fish bypass facility would both likely remain operational until the reservoir fills with sediment.

2.2 ALTERNATIVES CONSIDERED AND ELIMINATED

A number of alternatives have been previously considered and eliminated for the San Clemente Dam Seismic Safety Project. These include:

- Alternative designs for dam strengthening
- A new San Clemente Reservoir
- Dam removal through incremental notching and localized sediment management
- Alternative access routes
- Alternative means to excavate, transport, and dispose of sediment accumulated behind SCD
- Alternative disposal sites
- Alternative means to replace the CAW water diversion point at San Clemente Reservoir

Alternatives considered and eliminated are detailed in Section 3.1.

2.3 COMPARISON OF ALTERNATIVES: IMPACTS AND MITIGATION MEASURES

Table 2.1 presents a summary and comparison of the San Clemente Dam Seismic Safety Project, including the Proponent's Proposed Project and its alternatives. The matrix shows the affected resource areas and impact issues, and summarizes impact significance and mitigation for each alternative. The following discussion highlights key comparative impacts among the project alternatives. It also discusses changes and additional information provided in this Final EIR/EIS in response to comments that clarify and amplify the information included in the Draft EIR/EIS. The changes and additions are described in a summary manner. Further details and reasons for the changes are discussed in the specific resource sections. Where an issue determination has been changed, it is discussed under the specific issue heading for that alternative.

If an environmental resource issue is specified as “short-term” or “long-term” in Table 2.1, the referenced issue is limited to the respective definitions of these terms presented below, and in Chapter 4.0 of this report:

- Short-term impacts typically occur within the construction period (concurrent with the number of construction seasons, and vary from one alternative to another) or as a result of construction.
- Long-term impacts persist beyond the construction period and typically involve operations. They may be intermittent but over a longer period.
- Some of the resource issues have impacts that are both short-term and long-term.

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
GEOLOGY & SOILS					
GS-1: Ground Shaking *Risk of dam failure due to seismic activity*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	DOES NOT APPLY (dam removal eliminates risk of failure)	DOES NOT APPLY (dam removal eliminates risk of failure)	**Impact**: long-term, significant and unavoidable risk of dam failure under maximum credible earthquake
GS-2: Access Route Landslides/Slope Stability *Risk of slides due to oversteepening hillsides*	**Impact**: short-term, less than significant with mitigation **Mitigation**: geotechnical design of road improvements, BMPs; in addition to SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: geotechnical design of road improvements, BMPs; in addition to SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: geotechnical design of road improvements, BMPs; in addition to SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: geotechnical design of road improvements, BMPs; in addition to SWPPP (Appendix K)	DOES NOT APPLY
GS-3: Reservoir Landslides *Risk of slides due to oversteepening hillsides*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
GS-4: Soil Erosion *Risk of erosion along access road improvements and in sediment disposal areas; sediment and rock discharge to streams*	**Impact**: long-term, less than significant with mitigation **Mitigation**: erosion control and water quality BMPs in the SWPPP (Appendix K) NOTE: use of sediment disposal areas would not apply to the Proponent's Proposed Project.	**Impact**: long-term, less than significant with mitigation **Mitigation**: erosion control and water quality BMPs in the SWPPP (Appendix K)	**Impact**: long-term, less than significant with mitigation **Mitigation**: erosion control and water quality BMPs in the SWPPP (Appendix K)	**Impact**: long-term, less than significant with mitigation **Mitigation**: erosion control and water quality BMPs in the SWPPP (Appendix K)	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
GS-5: Bypass Rock Removal by Blasting *Topography alteration and safety hazards associated with blasting*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	**Impact**: short-term, less than significant with mitigation **Mitigation**: Blasting Safety Plan Preliminary blasting BMPs have been incorporated into the SWPPP (Appendix K).	DOES NOT APPLY
GS-6: Erosion at Left Dam Abutment *Risk of erosion due to dam overtopping, leading to dam failure*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	**Impact**: long-term, significant, unavoidable
HYDROLOGY & WATER RESOURCES					
WR-1: Changes in Streamflow During Construction *Changes in streamflow downstream of the Dam during construction drawdown, dewatering the plunge pool, or when inflow exceeds the bypass capacity*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WR-2a: Changes in Sediment Flow Passing SCD Immediately After Construction *Changes in the amount of sediment transported from the upper watershed (above SCD) to the lower Carmel River (below SCD) immediately after construction*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, significant, unavoidable **Mitigation**: Stream restoration and revegetation would stabilize sediment in reservoir area and avoid long-term significant impacts. These actions would occur in 7250 feet of the Carmel River and 3000 feet of San Clemente Creek.	**Impact**: short-term, significant, unavoidable **Mitigation**: Stream restoration and revegetation would stabilize sediment in reservoir area and avoid long-term significant impacts. These actions would occur in 200 feet of the Carmel River, 3000 feet of San Clemente Creek, and a 450-foot bypass channel.	DOES NOT APPLY
WR-2b: Changes in Sediment Storage and Composition in the Lower River During Construction *Changes in the sediment composition in the Carmel River below SCD*	**Impact**: short-term, less than significant with mitigation **Mitigation**: Water Quality Protection Plan including diversion of turbid water to settling basin (Appendix K SWPPP)	**Impact**: short-term, less than significant with mitigation **Mitigation**: Water Quality Protection Plan including diversion of turbid water to settling basin (Appendix K SWPPP)	**Impact**: short-term, significant, unavoidable **Mitigation**: Stream restoration and revegetation would avoid long-term significant impacts. These actions would occur in 7250 feet of the Carmel River and 3000 feet of San Clemente Creek.	**Impact**: short-term, significant, unavoidable Mitigation: Stream restoration and revegetation would avoid long-term significant impacts. These actions would occur in 200 feet of the Carmel River, 3000 feet of San Clemente Creek, and a 450-foot bypass channel.	DOES NOT APPLY
WR-3a: Change in Sediment Deposition in the Reservoir *Changes in the amount of sediment deposited in the reservoir upstream of SCD*	**Impact**: long-term, less than significant with mitigation, potentially beneficial **Mitigation**: Implementation of the SOMP (Appendix J)	**Impact**: long-term, less than significant with mitigation, potentially beneficial **Mitigation**: Implementation of the SOMP (Appendix J)	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant, potentially beneficial

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WR-3b: Increased Sediment Deposition that Obstructs Fish Passage *During low-flow years, when all the flow is through the fish ladder, sediment would move close to the fish ladder, and possibly impair fish passage from the ladder to the remnant pool*	**Impact**: long-term, less than significant with mitigation **Mitigation**: decrease capacity of the ladder forcing more water over spillway; implement SOMP	**Impact**: long-term, less than significant with mitigation **Mitigation**: decrease capacity of the ladder forcing more water over spillway; implement SOMP	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant with mitigation **Mitigation**: design of reconstructed channel and bypass channel to allow for fish passage	**Impact**: long-term, significant, unavoidable
WR-4a: Increased Sediment Deposition in the Lower River *Increased sediment load passing SCD depositing in the Carmel River bed below SCD*	**Impact**: long-term, less than significant, potentially beneficial **Mitigation**: no mitigation required	**Impact**: long-term, less than significant, potentially beneficial **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable **Mitigation**: none available	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant, potentially beneficial
WR-4b: Increase in Frequency of High Suspended Sediment Concentrations *High flow will increase the sediment concentration in the river and sediment management activities, such as sluicing, would further increase the suspended sediment concentration downstream of the Dam*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable **Mitigation**: none available	**Impact**: long-term, significant, unavoidable **Mitigation**: none available	**Impact**: long-term, less than significant

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WR-5: Changes in Channel Bed Geometry *Additional sediment passing the Dam to the lower river would aggrade or degrade the river channel or change the channel cross section*	**Impact**: long-term, less than significant potentially beneficial **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable **Mitigation**: none available	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant
WR-6: Changes to the 100-year Flood Elevation *The increased sediment loading would alter the bed of the Carmel River and influence the 100-year flood elevation*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable **Mitigation**: monitor downstream sediment accumulation; increases >0.5 feet would trigger channel restoration	**Impact**: long term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant
WR-7: Impact to Location or Timing of Water Supply Diversions *Changes to the location or timing of water supply diversions*	DOES NOT APPLY	**Impact**: long-term, less than significant with mitigation **Mitigation**: diversion would be operated to maintain fish passage flows in January-May. Diversion affects 7200 feet of stream	**Impact**: long-term, less than significant with mitigation **Mitigation**: diversion would be operated to maintain fish passage flows in January-May. Diversion affects 7200 feet of stream	**Impact**: long-term, less than significant with mitigation **Mitigation**: diversion would be operated to maintain fish passage flows in January-May. Diversion affects 3200 feet of stream	DOES NOT APPLY
WR-8: Increase Risk of Dam Failure *Risk of dam failure due to seismic activity or flooding, leading to or increasing downstream flooding*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required; dam thickening design eliminates risk of failure	**Impact**: long-term, less than significant **Mitigation**: no mitigation required; dam notching design eliminates risk of failure	DOES NOT APPLY dam removal eliminates risk of failure	DOES NOT APPLY dam removal eliminates risk of failure	**Impact**: long-term, significant and unavoidable risk of dam failure under MCE or PMF

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WATER QUALITY					
WQ-1: Road Construction and Improvement Activities *Sediment discharge to watercourses, increased turbidity*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K).	DOES NOT APPLY
WQ-2: Instream, Streambank and/or Stream Margin Construction Activities *Disturbance of streambeds, increased turbidity*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) Note: Less than 1 acre of streambed impacted	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K). Note: Approximately 7.7 acres of streambed impacted	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) Note: Approximately 8.9 acres of streambed impacted	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) Note: Approximately 8.6 acres of streambed impacted	DOES NOT APPLY
WQ-3: Accidental Leaks and Spills of Toxic Substances *Discharge of toxic substances*	Impact: short-term, less **than** significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) and SPCC (Appendix R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) and SPCC (Appendix R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) and SPCC (Appendix R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP Appendix K) and SPCC (Appendix R)	DOES NOT APPLY
WQ-4: Stream Diversions, Sheetpile Cutoff Walls, and Cofferdams *Increased suspended sediment and turbidity*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WQ-5: Stream Diversions Ponded Areas *Increased turbidity and temperature, decreased dissolved oxygen*	**Impact**: short-term, less than significant with mitigation **Mitigation**: pipeline design to minimize effects, monitoring, mixing to reduce high water temperatures	**Impact**: short-term, less than significant with mitigation **Mitigation**: pipeline design to minimize effects, monitoring, mixing to reduce high water temperatures	**Impact**: short-term, less than significant with mitigation **Mitigation**: pipeline design to minimize effects, monitoring, mixing to reduce high water temperatures	**Impact**: short-term, less than significant with mitigation **Mitigation**: pipeline design to minimize effects, monitoring, mixing to reduce high water temperatures	DOES NOT APPLY
WQ-6: Stream Diversions Return of Bypassed Flows *Localized scour, sedimentation and turbidity*	**Impact**: short-term, less than significant with mitigation **Mitigation**: energy dissipation structures	**Impact**: long-term, less than significant with mitigation **Mitigation**: energy dissipation structures	**Impact**: long-term, less than significant with mitigation **Mitigation**: energy dissipation structures	**Impact**: long-term, less than significant with mitigation **Mitigation**: energy dissipation structures	DOES NOT APPLY
WQ-7: Rewatering After Stream Diversions *Fine sediment and toxins in return flow*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY
WQ-8: Discharge from Settling Basins *Increased temperature and turbidity, decreased dissolved oxygen*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WQ-9: Reservoir Drawdown *Increased turbidity, decreased dissolved oxygen*	**Impact**: short-term, significant, unavoidable **Mitigation**: slow drawdown to minimize effects NOTE: reservoir partially drawn down	**Impact**: short-term, significant, unavoidable **Mitigation**: slow drawdown to minimize effects NOTE: reservoir completely dewatered impact greater than the Proponent's Proposed Project	**Impact**: short-term, significant, unavoidable **Mitigation**: slow drawdown to minimize effects NOTE: reservoir completely dewatered impact greater than the Proponent's Proposed Project	**Impact**: short-term, significant, unavoidable **Mitigation**: slow drawdown to minimize effects NOTE: reservoir completely dewatered impact greater than the Proponent's Proposed Project	**Impact**: long-term significant, unavoidable
WQ-10: Reservoir Sediment Excavation *Increased turbidity*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)) NOTE: minimal excavation specific quantities unknown	**Impact**: short-term, significant, unavoidable **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) NOTE: About 1.5 million cubic yards (cy) of sediment would be excavated	**Impact**: short-term, significant, unavoidable **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K) NOTE: About 2.5 million cubic yards (cy) of sediment would be excavated	**Impact**: short-term, significant, unavoidable **Mitigation** erosion control and water quality monitoring methods in the SWPPP (Appendix K) NOTE: 380,000 cubic yards (cy) of sediment would be excavated	DOES NOT APPLY
WQ-11: SCD Fish Ladder *Increased turbidity, release of toxic substances*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP and SPCC Plan (Appendix K and R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP and SPCC Plan (Appendix K and R)	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WQ-12: OCRD Notching *Increased turbidity, release of toxic substances*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY
WQ-13: Sluice Gates *Increased turbidity*	**Impact**: long-term, significant, unavoidable **Mitigation**: Implementation of the SOMP (Appendix J)	**Impact**: long-term, significant, unavoidable **Mitigation**: Implementation of the SOMP (Appendix J) NOTE: The elevated turbidity level would be greater for Alternative 1 than for the Proponent's Proposed Project, but could have a shorter period of duration	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
WQ-14: Dam-related Construction or Demolition *Increased turbidity, release of toxic substances and fine grained sediment*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP and SPCC Plan (Appendix K and R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP and SPCC (Appendix K and R)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY
WQ-15: Operations/Post-project Conditions *Improved post-project water quality in reservoir and restored streams*	**Impact**: beneficial **Mitigation**: no mitigation required	**Impact**: beneficial **Mitigation**: no mitigation required	**Impact**: beneficial **Mitigation**: no mitigation required	**Impact**: beneficial **Mitigation**: no mitigation required	**Impact**: long-term, significant, unavoidable

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WQ-16: Sediment Disposal *Stormwater sediment discharge at sediment disposal site.*	DOES NOT APPLY	**Impact**: long-term, less than significant with mitigation **Mitigation**: monitoring sediment disposal site and erosion control as needed following storm events (SWPPP Appendix K)	**Impact**: long-term, less than significant with mitigation **Mitigation**: monitoring sediment disposal site and erosion control as needed following storm events (SWPPP Appendix K)	**Impact**: long-term, less than significant with mitigation **Mitigation**: monitoring sediment disposal site and erosion control as needed (SWPPP Appendix K)	DOES NOT APPLY
WQ-17: Construction of Diversion Channel and Diversion Dike *Increased turbidity*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality monitoring methods in the SWPPP (Appendix K)	DOES NOT APPLY
FISHERIES					
FI-1: Access Route Improvements *Short-term alteration of aquatic habitat*	**Impact**: short-term, less than significant with mitigation; long-term, less than significant with mitigation **Mitigation**: limits on tree removal; measures to prevent roadfill from entering streams; streamside revegetation; SWPPP (Appendix K) Botanical Resources Management Plan (Appendix U) NOTE: Tularcitos Access Route.	**Impact**: short-term, less than significant with mitigation **Mitigation**: limits on tree removal; measures to prevent roadfill from entering streams; streamside revegetation; SWPPP (Appendix K), Botanical Resources Management Plan (Appendix U) NOTE: Cachagua Access Route	**Impact**: short-term, less than significant with mitigation **Mitigation**: limits on tree removal; measures to prevent roadfill from entering streams; streamside revegetation; SWPPP (Appendix K) Botanical Resources Management Plan (Appendix U) NOTE: Cachagua Access Route	**Impact**: short-term, less than significant with mitigation **Mitigation**: limits on tree removal; measures to prevent roadfill from entering streams; streamside revegetation; SWPPP (Appendix K) Botanical Resources Management Plan (Appendix U) NOTE: Cachagua Access Route	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
FI-2: Dewatering River Channels for Construction Purposes *Short-term loss of aquatic habitat*	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue, erosion control and water quality protection plan SWPPP (Appendix K), stream channel restoration NOTE: dewatering would occur during 1 construction season	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue, erosion control and water quality protection plan SWPPP (Appendix K), stream channel restoration NOTE: dewatering would occur during 1 construction season	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue, erosion control and water quality protection plan SWPPP (Appendix K), stream channel restoration NOTE: dewatering would occur during 3 construction seasons	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue, erosion control and water quality protection plan SWPPP (Appendix K), stream channel restoration NOTE: dewatering would occur during 1 construction season	DOES NOT APPLY
FI-3: Operation of a Trap and Truck Facility at OCRD *Short term loss of access for adult steelhead to upstream reaches*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
FI-4: Diversion of Carmel River and San Clemente Creek Around San Clemente Reservoir for Construction Purposes *Short-term loss of aquatic habitat*	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, NOTE: impacts to rearing habitat upstream of the reservoir, in about 1,200 feet of the inflowing Carmel River, and in less than 100 feet of San Clemente Creek during one construction year	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation NOTE: impacts to rearing habitat upstream of the reservoir for about 5,200 feet in the Carmel River and for about 1,350 feet in San Clemente Creek during two construction years.	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation NOTE: impacts to rearing habitat upstream of the reservoir for about 5,200 feet in the Carmel River and for about 1,350 feet in San Clemente Creek during three construction years.	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation NOTE: impacts to rearing habitat upstream of the reservoir for about 3,300 feet in the Carmel River and about 1,350 feet for San Clemente Creek during two construction years.	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

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FI-5: Reservoir Dewatering *Short-term loss of aquatic habitat*	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, erosion control and water quality protection plan (SWPPP Appendix K) NOTE: drawdown would occur during 1 construction season	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, erosion control and water quality protection plan (SWPPP Appendix K) NOTE: drawdown would occur during 2 construction seasons	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, erosion control and water quality protection plan (SWPPP Appendix K) NOTE: drawdown would occur during 3 construction seasons	**Impact**: short-term, significant, unavoidable **Mitigation**: fish rescue and relocation, erosion control and water quality protection plan (SWPPP Appendix K) NOTE: drawdown would occur during 2 construction seasons	**Impact**: long-term, significant, unavoidable
FI-6: Water Quality Effects on Fish *Short-term loss of aquatic habitat*	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality protection plan (SWPPP Appendix K), divert flows around reservoir, drawdown timing, insulate or shade diversion pipes, aeration	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality protection plan (SWPPP Appendix K), divert flows around reservoir, drawdown timing, insulate or shade diversion pipes, aeration	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality protection plan (SWPPP Appendix K)), divert flows around reservoir, drawdown timing, insulate or shade diversion pipes, aeration	**Impact**: short-term, less than significant with mitigation **Mitigation**: erosion control and water quality protection plan (SWPPP Appendix K)), divert flows around reservoir, drawdown timing, insulate or shade diversion pipes, aeration	DOES NOT APPLY
FI-7: Fish Ladder Closure *Short-term limiting fish movement past the Dam site*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Benefit**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
FI-8: Upstream Fish Passage *Long-term impact to fish migrating to upstream spawning and rearing habitat*	**Impact**: long-term, beneficial with mitigation **Mitigation**: ongoing, inspection of the river channel upstream of the fish ladder exit would be performed to determine that adequate channel depths are being maintained and implementation of the SOMP to maintain the upstream river channel for fish passage	**Impact**: long-term, beneficial with mitigation **Mitigation**: ongoing, inspection of the river channel upstream of the fish ladder exit would be performed to determine that adequate channel depths are being maintained. and implementation of the SOMP to maintain the upstream river channel for fish passage	**Impact**: long-term, beneficial **Benefit**: dam removed, upstream passage occurs in free-flowing stream	**Impact**: long-term, beneficial **Benefit**: dam removed, upstream passage occurs in free-flowing stream	**Impact**: long-term, significant, unavoidable
FI-9a: Sediment Impacts to Downstream Channels from Sluicing, Dredging, or Sediment Transport Downstream *Long-term alteration of aquatic habitat*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term significant, unavoidable; long-term beneficial **Mitigation**: channel restoration and revegetation (Appendix U), erosion control and water quality protection (SWPPP) Appendix K	**Impact**: short-term, less than significant; long-term beneficial **Mitigation**: no mitigation required	DOES NOT APPLY
FI-9b: Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage *Potential juvenile fish entrainment and mortality*	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	**Impact**: long-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
FI-10: Relocate CAW Water Diversion Upstream *Long-term reduction of flow in reaches of Carmel River between the new diversion point and dam*	DOES NOT APPLY	**Impact**: long-term, less than significant with mitigation **Mitigation**: an Operations Plan would be developed in conjunction with NMFS, CDFG, SWRCB, and the MPWMD to establish flows for steelhead habitat in this reach of the river	**Impact**: long-term, less than significant with mitigation **Mitigation**: an Operations Plan would be developed in conjunction with NMFS, CDFG, SWRCB, and the MPWMD to establish flows for steelhead habitat in this reach of the river	**Impact**: long-term, less than significant with mitigation **Mitigation**: an Operations Plan would be developed in conjunction with NMFS, CDFG, SWRCB, and the MPWMD to establish flows for steelhead habitat in this reach of the river	DOES NOT APPLY
FI-11: Fish Screen Installation *Long-term elimination of entrainment or impingement at the diversion*	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	DOES NOT APPLY
FI-12: Downstream Fish Passage Over SCD *Long-term improvement to fish passage over the Dam*	**Impact**: long-term, beneficial **Mitigation**: improved fish ladder and spillway modifications improve fish passage conditions	**Impact**: long-term, beneficial **Mitigation**: lower dam and low flow channel in spillway improve fish passage conditions	DOES NOT APPLY	DOES NOT APPLY	**Impact**: long-term, significant unavoidable
FI-13: Stream Sediment Removal, Storage, and Associated Restoration *Long-term reduction of aquatic habitat, short-term alteration of aquatic habitat*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable; long-term, less than significant with mitigation **Mitigation**: stream channel restoration in historic alignment, riparian revegetation	**Impact**: short-term, significant, unavoidable; long-term, beneficial **Mitigation**: stream channel restoration in historic alignment, riparian revegetation	**Impact**: short-term, significant, unavoidable; long-term, beneficial **Mitigation**: new channel constructed through bypass and SCC, riparian revegetation	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
FI-14: Notching OCRD *Short-term loss of rearing habitat, Improvement of fish passage*	**Impact**: short-term, less than significant with mitigation; long-term, beneficial **Mitigation**: fish rescue, stream recontoured to match new alignment, access roads regraded, riparian revegetation	**Impact**: short-term, less than significant with mitigation; long-term, beneficial **Mitigation**: fish rescue, stream recontoured to match new alignment, access roads regraded, riparian revegetation	**Impact**: short-term, less than significant with mitigation; long-term, beneficial **Mitigation**: fish rescue, stream recontoured to match new alignment, access roads regraded, riparian revegetation	**Impact**: short-term, less than significant with mitigation; long-term, beneficial **Mitigation**: fish rescue, stream recontoured to match new alignment, access roads regraded, riparian revegetation	DOES NOT APPLY
FI-15: Sleepy Hollow Steelhead Rearing Facility *Loss or degradation of water supply*	**Impact**: long-term, less than significant with mitigation **Mitigation**: an alternative water supply would be made available to the SHSRF in the Carmel River	**Impact**: long-term, less than significant with mitigation **Mitigation**: an alternative water supply would be made available to the SHSRF in the Carmel River	**Impact**: long-term, less than significant with mitigation **Mitigation**: an alternative water supply would be made available to the SHSRF in the Carmel River	**Impact**: long-term, less than significant with mitigation **Mitigation**: an alternative water supply would be made available to the SHSRF in the Carmel River	**Impact**: long-term, significant, unavoidable
TERRESTRIAL BIOLOGY					
VE-1: Special-Status Plant Species *Effects on Virgate eriastrum or Lewis's clarkia populations*	**Impact**: short-term, less than significant with mitigation **Mitigation**: avoid populations of CNPS List 4 species	**Impact**: short-term, less than significant with mitigation **Mitigation**: avoid populations of CNPS List 4 species	**Impact**: short-term, less than significant with mitigation **Mitigation**: avoid populations of CNPS List 4 species	**Impact**: short-term, less than significant with mitigation **Mitigation**: avoid populations of CNPS List 4 species	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
VE-2: Loss of Protected Oak Woodland *Loss of oak woodlands*	**Impact**: long-term, less than significant with mitigation **Mitigation**: avoid stand of blue oak along "high road" access by fencing. Botanical Resources Management Plan (Appendix U) provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, protection from browsing NOTE: Smallest acreage of oak woodland potentially impacted	**Impact**: long-term, less than significant with mitigation **Mitigation**: avoid stand of blue oak along "high road" access by fencing. Botanical Resources Management Plan (Appendix U) provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, protection from browsing NOTE: 2nd largest area of oakwood lands that may be impacted	**Impact**: long-term, less than significant with mitigation **Mitigation**: avoid stand of blue oak along "high road" access by fencing. Botanical Resources Management Plan (Appendix U) provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, protection from browsing NOTE: Largest area of oak woodland that may be impacted	**Impact**: long-term, less than significant with mitigation **Mitigation**: avoid stand of blue oak along "high road" access by fencing. Botanical Resources Management Plan (Appendix U) provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, protection from browsing NOTE: 3rd largest area of oak woodland that may be impacted	DOES NOT APPLY
VE-3: Loss of other Native Vegetation *Loss of native vegetation*	**Impact**: long-term, less than significant with mitigation **Mitigation**: facility and access footprints minimize loss of native vegetation; fencing; diffuse outflows to minimize erosion; supplemental irrigation; Botanical Resources Management Plan (Appendix U)	**Impact**: long-term, less than significant with mitigation **Mitigation**: facility and access footprints minimize loss of native vegetation; fencing; diffuse outflows to minimize erosion; supplemental irrigation; Botanical Resources Management Plan (Appendix U)	**Impact**: long-term, less than significant with mitigation **Mitigation**: facility and access footprints minimize loss of native vegetation; fencing; diffuse outflows to minimize erosion; supplemental irrigation; Botanical Resources Management Plan Appendix U)	**Impact**: long-term, less than significant with mitigation **Mitigation**: facility and access footprints minimize loss of native vegetation; fencing; diffuse outflows to minimize erosion; supplemental irrigation; Botanical Resources Management Plan (Appendix U)	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
VE-4: Indirect Effects on Native Vegetation *Effects caused by increased erosion and sedimentation*	**Impact**: short-term, less than significant with mitigation **Mitigation**: BMPs for erosion control; minimize changes to existing drainage patterns; avoid work within tree dripline; dust control; revegetation; monitoring see Botanical Resources Management Plan (Appendix U) and SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: BMPs for erosion control; minimize changes to existing drainage patterns; avoid work within tree dripline; dust control; revegetation; monitoring see Botanical Resources Management Plan (Appendix U) and SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: BMPs for erosion control; minimize changes to existing drainage patterns; avoid work within tree dripline; dust control; revegetation; monitoring see Botanical Resources Management Plan (Appendix U) and SWPPP (Appendix K)	**Impact**: short-term, less than significant with mitigation **Mitigation**: BMPs for erosion control; minimize changes to existing drainage patterns; avoid work within tree dripline; dust control; revegetation; monitoring see Botanical Resources Management Plan (Appendix U) and SWPPP Appendix K)	DOES NOT APPLY
WI-1: Dam Strengthening *Disruption of bat nesting areas*	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction survey followed by consultation	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
WI-2: Removal of Ancillary Facilities *Displacement of special-status bats*	DOES NOT APPLY	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction survey followed by consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction survey followed by consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction survey followed by consultation	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WI-3: Cofferdam Construction and Plunge Pool Dewatering *Adverse effects to special-status species*	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: preconstruction survey; rescue and relocate CRLF and Western pond turtles; monitoring; predator removal. (see Appendix V Protection Measures for Special-status Species)	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: preconstruction survey; rescue and relocate CRLF and Western pond turtles; monitoring; predator removal. (see Appendix V Protection Measures for Special status-Species)	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: preconstruction survey; rescue and relocate CRLF and Western pond turtles; monitoring; predator removal. (see Appendix V Protection Measures for Special-status-Species)	**Impact**: short-term, significant, unavoidable; long term beneficial with mitigation **Mitigation**: preconstruction survey; rescue and relocate CRLF and Western pond turtles; monitoring; predator removal. (see Appendix V Protection Measures for Special-status Species)	DOES NOT APPLY
WI-4: Notching OCRD *Effects on spawning habitat and herpetofauna*	**Impact**: short-term, less than significant with mitigation **Mitigation**: site habitat assessment and protocol surveys followed by agency consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: site habitat assessment and protocol surveys followed by agency consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: site habitat assessment and protocol surveys followed by agency consultation	**Impact**: short-term, less than significant with mitigation **Mitigation**: site habitat assessment and protocol surveys followed by agency consultation	DOES NOT APPLY
WI-5: Concrete Batch Plant Construction and Operation *Habitat for special-status species*	**Impact**: short-term, less than significant with mitigation **Mitigation**: preconstruction surveys and relocation of horned lizards and CRLF with barriers to prevent recolonization; Cooper's hawk nest surveys and avoidance, noise abatement; monitoring. clearing (see Appendix V Protection Measures for Special-status Species)	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WI-6: Tularcitos Access Road Construction *Effects to special-status species*	**Impact**: short-term, less than significant with mitigation **Mitigation**: minimize tree removal; pre-construction surveys and avoid dusky-footed woodrat nests; erosion controls; barriers; bat surveys along Tularcitos route and avoid roosts. (see Appendix V Protection Measures for Special-status species)	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
WI-7: Reservoir Drawdown without Sediment Removal *Effects on California red-legged frog (CRLF) habitat*	**Impact**: short-term significant unavoidable; long term beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; abundance surveys	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
Issue WI-8: Vegetation Removal and Construction-Related Disturbance *Effects on Special-Status Bird Species and Others Protected by the Migratory Bird Treaty Act or Raptor Protections*	**Impact**: short-term, less than significant with mitigation **Mitigation**: vegetation removal would be conducted between Mar. 1-Aug.1 to the extent possible. If vegetation removed outside Mar. 1-Aug 1 timeframe, implementation of preconstruction surveys and avoidance measures for special-status species and migratory birds would be implemented	**Impact**: short-term, less than significant with mitigation **Mitigation**: vegetation removal would be conducted between Mar. 1-Aug.1 to the extent possible. If vegetation removed outside Mar. 1-Aug 1 timeframe, implementation of preconstruction surveys and avoidance measures for special-status species and migratory birds would be implemented	**Impact**: short-term, less than significant with mitigation **Mitigation**: vegetation removal must be conducted between Mar. 1- Aug. 1, implementation of preconstruction surveys and avoidance measures for special-status species and migratory birds	**Impact**: short-term, less than significant with mitigation **Mitigation**: vegetation removal must be conducted between Mar. 1- Aug. 1, implementation of preconstruction surveys and avoidance measures for special-status species and migratory birds	DOES NOT APPLY
WI-9 Pre-Existing Access Road Improvements *Effects to special-status species*	**Impact**: short-term, less than significant with mitigation. **Mitigation**: minimize tree removal; map and flag active wood rat nests along route; routes planned to avoid dusky-footed woodrat nests; erosion controls; barriers; map, flag, and avoid roosts. (see Appendix V Protection Measures for Special-status Species) NOTE: Applies only to improvements to San Clemente Drive.	**Impact**: short-term, less than significant with mitigation **Mitigation**: minimize tree removal; map and flag active wood rat nests along route; routes planned to avoid dusky-footed woodrat nests; erosion controls; barriers; map, flag, and avoid roosts. (see Appendix V Protection Measures for Special-status Species) NOTE: Applies to improvements to San Clemente Drive and Cachagua and the Jeep Trail	**Impact**: short-term, less than significant with mitigation **Mitigation**: minimize tree removal; map and flag active wood rat nests along route; routes planned to avoid dusky-footed woodrat nests; erosion controls; barriers; map, flag, and avoid roosts. (see Appendix V Protection Measures for Special-status Species) NOTE: Applies to improvements to San Clemente Drive and Cachagua and the Jeep Trail	**Impact**: short-term, less than significant with mitigation **Mitigation**: minimize tree removal; map and flag active wood rat nests along route; routes planned to avoid dusky-footed woodrat nests; erosion controls; barriers; map, flag, and avoid roost. (see Appendix V Protection Measures for Special-status Species) NOTE: Applies to improvements to San Clemente Drive and Cachagua and the Jeep Trail	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WI-10: Reservoir Drawdown or Elimination with Sediment Removal *Effects on California red-legged frog (CRLF) habitat*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable; long-term; beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; hand vegetation clearing (see Appendix V Protection Measures for Special-status Species)	**Impact**: short-term, significant, unavoidable; long-term beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; hand vegetation clearing (see Appendix V Protection Measures for Special-status Species)	**Impact**: short-term, significant, unavoidable; long-term beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; hand vegetation clearing (see Appendix V Protection Measures for Special-status Species)	DOES NOT APPLY
WI-11: Sediment Removal *Destruction of spawning habitat*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; restrictions on vegetation clearing; abundance surveys	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; restrictions on vegetation clearing; abundance surveys	**Impact**: short-term, significant, unavoidable; long-term, beneficial with mitigation **Mitigation**: amphibian rescue and relocation; predator control; restrictions on vegetation clearing; abundance surveys	DOES NOT APPLY
WI-12: Sediment Transport And Disposal *Adverse effects to special-status species*	DOES NOT APPLY	**Impact**: long-term, less than significant with mitigation **Mitigation**: pre-construction surveys followed by implementation of BMPs	**Impact**: long-term, less than significant with mitigation **Mitigation**: pre-construction surveys followed by implementation of BMPs	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WI-13: Bypass Channel Excavation *Loss of habitat for special-status species*	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	**Impact**: long-term, significant, unavoidable **Mitigation**: rescue and relocate CRLF and Western pond turtles and presence/absence surveys for special-status species and flagging for avoidance	DOES NOT APPLY
WETLANDS					
WET-1: Permanent Loss of Wetlands and Other Waters of U.S. *Permanent loss of jurisdictional waters of the U.S.*	**Impact**: long-term, less than significant with mitigation **Mitigation**: Restoration, Mitigation & Monitoring Plan (in Botanical Resources Management Plan Appendix U).. Wetlands similar in function restored at a 3:1 ratio. Conservation easement or mitigation bank on similar, unaffected and fully functional wetlands at 3:1 ratio. Other waters restored or conserved at a 3:1 ratio. Final specifics of mitigation will be determined by the constraints of the 404(b) permit for the project	**Impact**: long-term, less than significant with mitigation **Mitigation**: Restoration, Mitigation & Monitoring Plan (in Botanical Resources Management Plan Appendix U). Wetlands similar in function restored at a 3:1 ratio. Conservation easement or mitigation bank on similar, unaffected and fully functional wetlands at 3:1 ratio. Other waters restored or conserved at a 3:1 ratio. Final specifics of mitigation would be determined by the constraints of the 404(b) permit for the project	**Impact**: long-term, less than significant with mitigation **Mitigation**: Restoration, Mitigation & Monitoring Plan (in Botanical Resources Management Plan Appendix U). Wetlands similar in function restored at a 3:1 ratio. Conservation easement or mitigation bank on similar, unaffected and fully functional wetlands at 3:1 ratio. Other waters restored or conserved at a 3:1 ratio. Final specifics of mitigation would be determined by the constraints of the 404(b) permit for the project	**Impact**: long-term, less than significant with mitigation **Mitigation**: Restoration, Mitigation & Monitoring Plan (in Botanical Resources Management Plan Appendix U). Wetlands similar in function restored at a 3:1 ratio. Conservation easement or mitigation bank on similar, unaffected and fully functional wetlands at 3:1 ratio. Other waters restored or conserved at a 3:1 ratio. Final specifics of mitigation would be determined by the constraints of the 404(b) permit for the project	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
WET-2: Short-term Disturbance of Wetlands and Other Waters of U.S. *Short-term filling of fringe wetlands*	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to Mitigation Measure WET-1, cofferdam timing and construction criteria, and protection of the plunge pool staging area. Replacement plantings at 3:1 ratio (see Mitigation VE-3)	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to Mitigation Measure WET-1, cofferdam timing and construction criteria, and protection of the plunge pool staging area. Replacement plantings at 3:1 ratio (see Mitigation VE-3)	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to Mitigation Measure WET-1, cofferdam timing and construction criteria, and protection of the plunge pool staging area. Replacement plantings at 3:1 ratio (see Mitigation VE-3)	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to Mitigation Measure WET-1, cofferdam timing and construction criteria, and protection of the plunge pool staging area. Replacement plantings at 3:1 ratio (see Mitigation VE-3)	DOES NOT APPLY
WET-3: Indirect Impacts to Wetlands and other Waters of U.S. *Indirect adverse impacts to vegetation, including increased erosion and sedimentation*	**Impact**: short-term, less than significant with mitigation **Mitigation**: mitigated by implementation of Mitigation Measure VE-4	**Impact**: short-term, less than significant with mitigation **Mitigation**: mitigated by implementation of Mitigation Measure VE-4	**Impact**: short-term, less than significant with mitigation **Mitigation**: mitigated by implementation of Mitigation Measure VE-4	**Impact**: short-term, less than significant with mitigation **Mitigation**: mitigated by implementation of Mitigation Measure VE-4	DOES NOT APPLY
AIR QUALITY					
AQ-1: Dam Site Activities *Short-term emissions from construction equipment and road dust*	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs, including watering, chemical stabilization, and other measures	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs, including watering, chemical stabilization, and other measures	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs, including watering, chemical stabilization, and other measures	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs, including watering, chemical stabilization, and other measures	DOES NOT APPLY
AQ-2: Access Road Upgrades *Short-term dust and other emissions during access road improvements*	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs for dust suppression	**Impact**: short-term, significant, unavoidable **Mitigation**: BMPs for dust suppression	**Impact**: short-term significant, unavoidable **Mitigation**: BMPs for dust suppression	**Impact**: short-term significant, unavoidable **Mitigation**: BMPs for dust suppression	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
AQ-3: Project-Generated Traffic *Short-term dust and other emissions during project-related travel*	**Impact**: short-term, significant, unavoidable **Mitigation**: point of contact for residents to obtain corrective action when dust impacts occur which would include BMPs for dust suppression	**Impact**: short-term, significant, unavoidable **Mitigation**: point of contact for residents to obtain corrective action when dust impacts occur which would include BMPs for dust suppression	**Impact**: short-term, significant, unavoidable **Mitigation**: point of contact for residents to obtain corrective action when dust impacts occur which would include BMPs for dust suppression	**Impact**: short-term significant, unavoidable **Mitigation**: point of contact for residents to obtain corrective action when dust impacts occur which would include BMPs for dust suppression	DOES NOT APPLY
AQ-4: Concrete Batch Plant Operation *Operation of a new, short-term stationary source*	**Impact**: short-term, less than significant with mitigation **Mitigation**: compliance with MBUAPCD requirements under New Source Review rules	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
NOISE					
NO-1: Dam Site Activities *noise from construction equipment and activity*	**Impact**: short-term, significant, unavoidable **Mitigation**: limiting operations to daytime working hours	**Impact**: short-term, significant, unavoidable **Mitigation**: limiting operations to daytime working hours	**Impact**: short-term, significant, unavoidable **Mitigation**: limiting operations to daytime working hours	**Impact**: short-term, significant, unavoidable **Mitigation**: limiting operations to daytime working hours	DOES NOT APPLY
NO-2: Access Road Upgrades *noise generated during access road improvements*	**Impact**: short-term, significant, unavoidable **Mitigation**: use of quiet-design construction equipment, mufflers, enclosures; eliminate unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use	**Impact**: short-term, significant, unavoidable **Mitigation**: use of quiet-design construction equipment, mufflers, enclosures; eliminate unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use	**Impact**: short-term, significant, unavoidable **Mitigation**: use of quiet-design construction equipment, mufflers, enclosures; eliminate unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use	**Impact**: short-term, significant, unavoidable **Mitigation**: use of quiet-design construction equipment, mufflers, enclosures; eliminate unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
NO-3: Project-Generated Traffic *noise from construction-related travel, including mobilization, materials, and workers*	**Impact**: short-term, significant, unavoidable **Mitigation**: implementation of mitigation for NO-2, and in addition low speed limits and restrictions on timing of worker travel and truck deliveries	**Impact**: short-term, significant, unavoidable **Mitigation**: implementation of mitigation for NO-2, and in addition low speed limits and restrictions on timing of worker travel and truck deliveries	**Impact**: short-term, significant, unavoidable **Mitigation**: implementation of mitigation for NO-2, and in addition low speed limits and restrictions on timing of worker travel and truck deliveries	**Impact**: short-term, significant, unavoidable **Mitigation**: implementation of mitigation for NO-2, and in addition low speed limits and restrictions on timing of worker travel and truck deliveries	DOES NOT APPLY
NO-4: Concrete Batch Plant Operation *noise from operation of a new short-term stationary source*	**Impact**: short-term, significant, unavoidable **Mitigation**: sound-damped conveyors, equipment enclosures, mufflers; use material piles at the plant as noise berms	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
Issue NO-5: Sediment Disposal Site 4R Activities *noise from construction related travel and activity*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable **Mitigation**: standard measures: limiting operations to normal daytime working hours to reduce noise nuisances would be routinely applied to construction activities near the Stone Cabin	**Impact**: short-term, significant, unavoidable **Mitigation**: standard measures: limiting operations to normal daytime working hours to reduce noise nuisances would be routinely applied to construction activities near the Stone Cabin	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
TRAFFIC & CIRCULATION					
TC-1: Road Segment Traffic Operations *Additional traffic on area road network*	**Impact**: short-term, less than significant with mitigation **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety, flagging, escort of transport trucks	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety, flagging, escort of transport trucks	**Impact**: short-term significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety, flagging, escort of transport trucks	DOES NOT APPLY
TC-2: Intersection Traffic Operations *Changes to intersection level of service*	**Impact**: short-term, less than significant with mitigation **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes a traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
TC-3a: Traffic Safety Carmel Valley Road *Increased accident rates*	**Impact**: short-term, less than significant with mitigation Mitigation: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety **Mitigation** could also include funding additional traffic enforcement	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to mitigation TC-1, fund additional enforcement, widen Cachagua Road	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to mitigation TC-1, fund additional enforcement, widen Cachagua Road	**Impact**: short-term, less than significant with mitigation **Mitigation**: in addition to mitigation TC-1, fund additional enforcement, widen Cachagua Road	DOES NOT APPLY
TC-3b: Traffic Safety San Clemente Drive *Increased accident rates*	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
TC-4: Inadequate Corner Sight Distances *Inadequate visual sight distance at intersections for stopping safety*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant with mitigation **Mitigation**: improve affected intersections	**Impact**: short-term, less than significant with mitigation **Mitigation**: improve affected intersections	**Impact**: short-term, less than significant with mitigation **Mitigation**: improve affected intersections	DOES NOT APPLY
TC-5: New Intersections *Effect on safety and traffic*	**Impact**: short-term, less than significant with mitigation **Mitigation**: advance warning/signing; right turn taper on eastbound Carmel Valley Road approach to Tularcitos Access Road	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY
TC-6: Neighborhood Quality of Life *Effect of increased traffic on residential neighborhoods*	**Impact**: short-term, significant, unavoidable Mitigation: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant, unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	**Impact**: short-term, significant unavoidable **Mitigation**: construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety; Traffic/Transportation Plan that includes traffic coordination, trip reduction, and traffic safety	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
TC-7: Pavement Loadings *Effect of project traffic on pavement*	**Impact**: short-term, less than significant with mitigation **Mitigation**: repair damage to affected roads immediately after construction is completed	**Impact**: short-term, less than significant with mitigation **Mitigation**: repair damage to affected roads immediately after construction is completed	**Impact**: short-term, less than significant with mitigation **Mitigation**: repair damage to affected roads immediately after construction is completed	**Impact**: short-term, less than significant with mitigation **Mitigation**: repair damage to affected roads immediately after construction is completed	DOES NOT APPLY
CULTURAL RESOURCES					
CR-1: Ground Disturbance *Disturbance to archaeological sites*	**Impact**: long-term, less than significant with mitigation **Mitigation**: construction monitoring, avoid 3 archaeological sites, or archeological evaluation and/or historical documentation of them	**Impact**: long-term, less than significant with mitigation **Mitigation**: construction monitoring, avoid archaeological sites, or archeological evaluation and/or historical documentation	**Impact**: less than significant with mitigation, long-term **Mitigation**: construction monitoring, avoid archaeological sites, or archeological evaluation and/or historical documentation	**Impact**: long-term, less than significant with mitigation **Mitigation**: construction monitoring, avoid archaeological sites, or archeological evaluation and/or historical documentation	DOES NOT APPLY
CR-2: Damage to Historic Structures from Construction-related Vibration *Construction-related vibration*	**Impact**: short-term, less than significant with mitigation **Mitigation**: rigid support of excavation structures to minimize ground movement	**Impact**: short-term, less than significant with mitigation **Mitigation**: rigid support of excavation structures to minimize ground movement	**Impact**: short-term, less than significant with mitigation **Mitigation**: rigid support of excavation structures to minimize ground movement	**Impact**: short-term, less than significant with mitigation **Mitigation**: rigid support of excavation structures to minimize ground movement	DOES NOT APPLY
CR-3: Introduction of Short-term Dirt/Unintended Damage *Construction/demolition-related accumulation of dirt*	**Impact**: short-term, less than significant with mitigation **Mitigation**: spray water on the ground surface prior to ground disturbance.	**Impact**: short-term, less than significant with mitigation **Mitigation**: spray water on the ground surface prior to ground disturbance.	**Impact**: short-term, less than significant with mitigation **Mitigation**: spray water on the ground surface prior to ground disturbance.	**Impact**: short-term, less than significant with mitigation **Mitigation**: spray water on the ground surface prior to ground disturbance.	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
CR-4: Demolition or Alteration to Historic Properties *Alterations to OCRD and associated fish ladder and to SCD*	**Impact**: long-term, significant, unavoidable **Mitigation**: recordation of resources (HABS/HAER), interpretive displays, educational program	**Impact**: long-term, significant, unavoidable **Mitigation**: recordation of resources (HABS/HAER), interpretive displays, educational program	**Impact**: long-term, significant, unavoidable **Mitigation**: recordation of resources (HABS/HAER), interpretive displays, educational program	**Impact**: long-term, significant, unavoidable **Mitigation**: recordation of resources (HABS/HAER), interpretive displays, educational program	DOES NOT APPLY
CR-5: Alteration of Surrounding Environment *Alter character of setting for San Clemente Dam Historic Resource District*	**Impact**: long-term, significant, unavoidable **Mitigation**: prepare NRHP Nomination Form for Historic District, complete Historic Preservation Management Plan, MOA	**Impact**: long-term, significant, unavoidable **Mitigation**: prepare NRHP Nomination Form for Historic District, complete Historic Preservation Management Plan, MOA	**Impact**: long-term, significant, unavoidable **Mitigation**: prepare NRHP Nomination Form for Historic District, complete Historic Preservation Management Plan, MOA	**Impact**: long-term, significant, unavoidable **Mitigation**: prepare NRHP Nomination Form for Historic District, complete Historic Preservation Management Plan, MOA	DOES NOT APPLY
CR-6: Introduction of Visual Obstructions *Loss of visual integrity for San Clemente Dam Historic Resource District*	**Impact**: long-term, significant, unavoidable **Mitigation**: photographic documentation, use of compatible design, materials and construction methods	**Impact**: long-term, significant, unavoidable **Mitigation**: photographic documentation, use of compatible design, materials and construction methods	**Impact**: long-term, significant, unavoidable **Mitigation**: photographic documentation, use of compatible design, materials and construction methods	**Impact**: long-term, significant, unavoidable **Mitigation**: photographic documentation, use of compatible design, materials and construction methods	DOES NOT APPLY
VISUAL RESOURCES (AESTHETICS)					
VQ-1: Residential Views on Hills East of Carmel Valley Road *Operation of construction equipment within the viewshed*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
VQ-2: Changes to Viewsheds from Residences Adjacent to CVFP and SCD *Construction activities within the viewshed*	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	**Impact**: short-term, less than significant **Mitigation**: no mitigation required	DOES NOT APPLY
VQ-3: Residential Views from Sleepy Hollow *Operation of construction equipment and ancillary facilities within the viewshed*	**Impact**: short-term, significant, unavoidable **Mitigation**: none available NOTE: This includes the proposed concrete batch plant	**Impact**: short-term, less than significant **Mitigation**: no mitigation required NOTE: This does not include the proposed concrete batch plant	**Impact**: short-term, less than significant **Mitigation**: no mitigation required NOTE: This does not include the proposed concrete batch plant	**Impact**: short-term, less than significant **Mitigation**: no mitigation required NOTE: This does not include the proposed concrete batch plant	DOES NOT APPLY
VQ-4: Changes to Viewsheds from the Stone Cabin *Construction activities within the viewshed of the Carmel River*	DOES NOT APPLY	**Impact**: short-term, less than significant, beneficial, long-term **Mitigation**: no mitigation required	**Impact**: short-term, less than significant, beneficial, long-term **Mitigation**: no mitigation required	**Impact**: short-term, less than significant, beneficial, long-term **Mitigation**: no mitigation required	DOES NOT APPLY
VQ-5: Changes to Viewsheds from the Jeep Trail *Construction activities within the viewshed*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable; long-term, less than significant with mitigation **Mitigation**: short-term-screening the sediment disposal site adjacent to the Jeep Trail with vegetation during construction; long term, revegetation of the sediment disposal site and the removal of the sediment conveyor overcrossing	**Impact**: short-term, significant, unavoidable; long-term, less than significant with mitigation **Mitigation**: short-term-screening the sediment disposal site adjacent to the Jeep Trail with vegetation during construction; long term, revegetation of the sediment disposal site and the removal of the sediment conveyor overcrossing	DOES NOT APPLY	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
RECREATION					
REC-1: Access to Stone Cabin via Jeep Trail *Sediment pile blocked access via the Jeep Trail under the design for Site 4R proposed in the Draft EIR/EIS*	DOES NOT APPLY	**Impact**: short-term, less than significant **Mitigation**: no mitigation required. The alternative has been redesigned to move the disposal site uphill and provide a conveyor overcrossing. These changes would allow access to the cabin via the Jeep Trail during construction.	**Impact**: short-term, less than significant **Mitigation**: no mitigation required. The alternative has been redesigned to move the disposal site uphill and provide a conveyor overcrossing. These changes would allow access to the cabin via the Jeep Trail during construction.	DOES NOT APPLY	DOES NOT APPLY
REC-2: Disruption of Use of Jeep Trail to Stone Cabin *Heavy equipment traversing Jeep Trail*	DOES NOT APPLY	**Impact**: short-term, significant, unavoidable **Mitigation**: operation of heavy earth moving and other construction equipment would occur during normal working hours	**Impact**: short-term, significant and unavoidable **Mitigation**: operation of heavy earth moving and other construction equipment would occur during normal working hours	**Impact**: short-term, significant and unavoidable **Mitigation**: operation of heavy earth moving and other construction equipment would occur during normal working hours	DOES NOT APPLY
REC-3: Rerouting or Restoring the Carmel River Channel *Restore the river to its original free-flowing state*	DOES NOT APPLY	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	**Impact**: long, term, beneficial **Mitigation**: no mitigation required	**Impact**: long-term, beneficial **Mitigation**: no mitigation required	DOES NOT APPLY

Table 2-1: Impacts and Mitigation Matrix for Proponent's Proposed Project and Alternatives

ENVIRONMENTAL RESOURCES & ISSUES	PROPONENT'S PROPOSED PROJECT (DAM THICKENING)	ALTERNATIVE 1 (DAM NOTCHING)	ALTERNATIVE 2 (DAM REMOVAL)	ALTERNATIVE 3 (CARMEL RIVER REROUTE & DAM REMOVAL)	ALTERNATIVE 4 (NO PROJECT)
REC-4: Deposition of Sediment on Site 4R *Sediment disposal on parkland*	DOES NOT APPLY	**Impact**: short-term significant, unavoidable; long-term, less than significant with mitigation **Mitigation**: following construction, the open space park site would be restored to close to its pre-project state. The site would return to use as open space parkland	**Impact**: short-term significant, unavoidable; long-term less than significant with mitigation **Mitigation**: following construction, the open space park site would be restored to close to its pre-project state. The site would return to use as open space parkland	DOES NOT APPLY	DOES NOT APPLY
LAND USE					
LU-1: Conflict with Existing Plans and Policies in the Project Area *Construction and operations changing the existing land use*	**Impact**: long-term, less than significant with mitigation **Mitigation**: land use permits issued by Monterey County Planning and Building Inspection Department would render this issue impact less than significant	**Impact**: short-term, significant, unavoidable; long-term, less than significant **Mitigation**: consultation with the Monterey Park District would be required to ensure desired restoration of Site 4R and the Jeep Trail following construction activities.	**Impact**: short-term, significant; unavoidable; long-term, less than significant **Mitigation**: consultation with the Monterey Park District would be required to ensure desired restoration of Site 4R and the Jeep Trail following construction activities.	DOES NOT APPLY	DOES NOT APPLY
ENVIRONMENTAL JUSTICE					
EJ-1: Minority and Low Income Populations *Disproportionate Impacts on Minority and Low Income Populations*	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	**Impact**: less than significant **Mitigation**: no mitigation required	DOES NOT APPLY

Changes from Draft EIR/EIS to Final EIR/EIS

In response to comments received on the Draft EIR/EIS, additional information has been provided in this Final EIR/EIS which clarifies and amplifies the text and various determinations of significant impacts under CEQA.

Some of this information is in the form of additional sediment modeling which better define the impacts of specific actions – for example the sedimentation analysis described in Section 4.2 Hydrology and Water Resources and the Sediment Operations and Maintenance Plan (Appendix J). Some of the information is in the form of more detailed mitigation measures – for example a draft Storm Water Pollution Prevention Plan (Appendix K), a draft Spill Prevention, Containment, and Countermeasure Plan (Appendix R), a draft Biological Resources Plan (Appendix U) and a draft Special-Status Species Plan (Appendix V). Some impact issues have been divided into subsections or changed to rearrange impact analysis — for example in Section 4.2 Hydrology and Water Resources, several impact issues were rearranged so that impacts from construction and operation were separated and impacts upstream and downstream of the Dam were separated.

Several changes have been made to the alternatives that reduce impacts – for example, the sediment disposal site was moved from an area where it blocked access to the Stone Cabin, and the time for closure of the SCD fish ladder was moved later in the season when fish migration upstream is unlikely. Additional resource sections have been added based on public comment received — for example, Section 4.12 on Recreation and 4.13 on Land Use.

The discussion below identifies changes within each impact area. Further clarification is provided in the specific impact sections.

No Project Alternative

As described above, the No Project alternative would leave the Dam, and its existing facilities in place. A new fish ladder would not be constructed, the OCRD would not be notched and sediment behind the Dam would be left in place. These actions were evaluated as part of the No Project Alternative in the Draft EIR/EIS, but have been removed from the Final EIR/EIS to allow the report to conform more closely to the intent of a No Project (No Action) alternative under NEPA and CEQA and to be consistent with the NOP. Since the No Project Alternative is considered unlikely because it would leave the Dam out of compliance with DSOD standards, the changes are not discussed in the comparisons below.

Geology

Geological and soils effects under all alternatives would be less than significant or mitigable to levels less than significant with the exception of the seismic risk and erosion at the left Dam abutment causing SCD failure, leading to downstream flooding. This would be significant and unavoidable under the No Project Alternative, but would be

avoided by the selection of the Proponent's Proposed Project or any of its action alternatives.

In response to comments received on the Draft EIR/EIS, additional information has been provided in this Final EIR/EIS which clarifies and amplifies the following determination of significant impacts under CEQA:

- **Issue GS-5: Bypass Rock Removal by Blasting**: Blasting entails safety hazards and could trigger landslides on unstable slopes. The significance determination has been changed from less than significant to less than significant with mitigation. Preliminary blasting BMPs have been incorporated into the SWPPP (Appendix K). Implementation of additional measures in a complete blasting plan (required as part of final construction specifications) would reduce blasting-related impacts to a less than significant level.

Hydrology and Water Resources

The key factor differentiating alternatives for this resource area is the change in the flux of sediment passing the SCD site. The amount and composition of sediment passing downstream drives changes in riverine sediment composition, riverine sediment storage, channel bed geometry, and the elevation of the 100-year floodplain.

Under the Proponent's Proposed Project and Alternative 1, the SOMP (Appendix J) would be used to regulate downstream sediment releases. Neither of these alternatives would have significant and unavoidable effects on sediment flows, storage, composition, deposition, suspended sediments, channel geometry, or the 100-year flood elevation. Implementation of the SOMP and water quality BMPs included in the Storm Water Pollution Prevention Water Quality Protection Plan (Appendix K) would reduce any impacts to levels less than significant. In a few cases, impacts could be beneficial (e.g., to sediment deposition in the lower river).

The dam removal alternatives (Alternatives 2 and 3) would have significant, unavoidable short-term effects on sediment flow, composition, and storage during construction due to sediment mobilized from restored stream channels. Both alternatives would significantly increase the frequency of high suspended sediment concentrations in the Carmel River downstream of SCD. Under these alternatives, the Dam would be removed and the largest amount of sediment transport would occur past the Dam site and down the Carmel River. Alternative 2 would experience the largest component of sediment transport past the dam site because Alternative 3 retains the lower gradient reach upstream of the bypass channel, similar to a hung valley in a natural river system, that would store some of the sediment transported from upstream. Sediment may be mobilized from the unexcavated sediment remnants in the restored stream channels under Alternatives 2 and 3. Under Alternative 2, the river would return to its pre-dam sediment transport rate in the inundation zone, however Alternative 2 would have long-term significant and unavoidable impacts on sediment deposition and channel geometry in the lower Carmel River. No mitigation is available for these impacts.

Under the No Project Alternative, the reservoir would fill at the same rate as under existing conditions and some sediment would be passed downstream. In response to comments received on the Draft EIR/EIS, several of the Impact Issues were disaggregated into separate issues in the Final EIR/EIS and additional information has been provided which clarifies and amplifies the discussion of these impacts: WR-2 became WR-2a, 3a, 3b, 4a, and 4b; WR-3 became a portion of 2b and WR-4 became a portion of 2b and 4a. The issues addressed in each of the refined impacts issues are briefly described below and in more detail in Section 4.2.

- **WR-2a: Changes in Sediment Flow Passing the San Clemente Dam Immediately after Construction**. This impact issue was clarified to apply to conditions immediately after construction. Further modeling determined that the short-term impact of Issue WR-2a would be significant and unavoidable under Alternatives 2 and 3 (instead of less than significant with mitigation for WR-2 in the Draft EIR/EIS). For Alternative 1, the determination changed from less than significant with mitigation to no mitigation required.

- **WR-2b: Changes in Sediment Storage and Composition in the Lower River during Construction**. This issue applies only to short-term impacts (whereas the Draft EIR/EIS issues WR-3 and WR-4 included both short- and long-term considerations). Further modeling determined that this impact would not be significant and unavoidable for all the action alternatives, as stated in the draft. It was determined to be less than significant with mitigation under the Proponent's Proposed Project and Alternative 1; and significant and unavoidable under Alternatives 2 and 3.

- **WR-3a: Change in Sediment Deposition in the Reservoir.** This impact issue addresses long-term effects of sediment deposition. It would be less than significant with mitigation and potentially beneficial under the Proponent's Proposed Project and Alternatives 1, and less than significant with mitigation under Alternatives 2, 3, and 4.

- **WR-3b: Increased Sediment Deposition that Obstructs Fish Passage**. This impact issue addresses long-term effects of sediment deposition. It is less than significant with mitigation under all project alternatives (but under Alternative 2, no mitigation is required). Under Alternative 4 (No Project), it is significant and unavoidable.

- **WR-4a: Increased Sediment Deposition in the Lower River**. This impact issue addresses long-term effects of sediment deposition. It was less than significant, potentially beneficial under the Proponent's Proposed Project and Alternatives 1 and 4; less than significant with no mitigation required under Alternative 3; and significant and unavoidable under Alternative 2.

- **WR-4b: Increase in frequency of High suspended Sediment Concentrations**. This impact issue addresses long-term effects of sediment deposition. It was determined to be less than significant with no mitigation under the Proponent's

Proposed Project, Alternative 1 and Alternative 4; and significant and unavoidable under Alternatives 2 and 3.

- **WR-5: Changes in Channel Bed Geometry**. This issue is numbered as it was in the Draft EIR/EIS. It would be less than significant with mitigation for all project alternatives in the Draft EIR/EIS. Further modeling conducted for the Final EIR/EIS determined it would be less than significant with no mitigation required under the Proponent's Proposed Project and Alternatives 1, 3 and 4 and significant and unavoidable under Alternative 2.

- **WR-6: Changes to the 100-year Flood Elevation**. This issue is numbered as it was in the Draft EIR/EIS. Further modeling conducted for the Final EIR/EIS determined this issue would be less than significant with no mitigation required under the Proponent's Proposed Project and Alternatives 1, 3 and 4 and significant and unavoidable under Alternative 2.

- **WR-7: Impact to the Location or Timing of Water Supply Diversions**. This issue is numbered as it was numbered in the Draft EIR/EIS. The issue has also been clarified to consider the location and timing of water supply diversions. For the Draft EIR/EIS, no mitigation would be required (although screening of the intake was proposed); in the Final EIR/EIS, mitigation would be required, consisting of operating the diversion to maintain fish passage flows from January through May.

Water Quality

Sluicing under the Proponent's Proposed Project and Alternative 1 would lead to increases in turbidity in the Carmel River below the Dam. All of the action alternatives entail construction activities, where the fish ladder would be replaced and the OCRD would be notched. The Proponent's Proposed Project and the action alternatives all would involve partial or complete dewatering of the construction areas and plunge pool for from one to four construction years. Activities at construction sites and along access roads where new routes or improvements are undertaken would entail potential discharge of contaminants to watercourses in the Project Vicinity, including the Carmel River, San Clemente Creek, and Tularcitos Creek. These would include localized scour, stream bed disturbance, and erosion leading to sediment discharge, suspended sediment and turbidity. Other effects would include changes in temperature and levels of dissolved oxygen and accidental spills and leaks of toxic substances.

In response to comments received on the Draft EIR/EIS, additional information has been provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA:

- **Issue WQ-9: Reservoir Drawdown**. Under Alternatives 2 and 3, the reservoir would be completely dewatered during project implementation; the impacts would be the same as in the Proponent's Proposed Project and Alternative 1 and would be significant and unavoidable.

- **Issue WQ-10: Reservoir Sediment Excavation**. Under Alternatives 2 and 3, the sediment would be excavated from the reservoir during project implementation; the impacts would be the same as Alternative 1 except sediment excavation quantities would be different, (2.5 million cubic yards for Alternative 2 and 500,000 cubic yards for Alternative 3). Very fine suspended sediments and iron oxides would be expected to remain in suspension in the reservoir, resulting in elevated turbidity and decreased dissolved oxygen levels during the two periods of excavation activity and for about two months following excavation. The impacts would be significant and unavoidable.

Fisheries

The Proponent's Proposed Project and action alternatives entail a number of activities which would cause the short-term loss and degradation of aquatic habitats and cause mortality to fish. Some of these (e.g., replacing bridge piers, fish rescues and relocations, and notching the OCRD), are similar among all of the action alternatives.

Sluicing to manage sediment accumulations behind SCD would cause limited short term increases in suspended sediment and turbidity that would be repeated each year, leading to less than significant impacts on fish as the increases would be similar to the turbidity caused during a storm event. Restoring the sediment transport capacity past the Dam would increase suspended sediment levels downstream of SCD and increase the volume of coarse sediment delivered to the river channel downstream of the Dam. This increase can have short term significant adverse impacts and long-term beneficial impacts to habitat conditions in the lower river.

Construction-related diversions of the Carmel River and San Clemente Creek would have greater impacts for Alternatives 1, 2, and 3, than for the Proponent's Proposed Project because of the increased number of years needed to complete these projects. Depending on permit conditions, construction-related stream diversions would last for one to two years under the Proponent's Proposed Project, two to three years for Alternatives 1 and 3, and three to four years for Alternative 2. The annual effects of dewatering the plunge pool, the reservoir area, and diverting the inflowing streamflow around the reservoir area would be somewhat similar in the same construction year across the alternatives with effects varying depending on the number of construction years and extent of the area to be dewatered. Reservoir drawdown would be required under all the alternatives as well, but would not last as long or be as severe under the No Project Alternative (this alternative would entail the continuation of "interim drawdowns" until the reservoir fills with sediment).

The Proponent's Proposed Project and all the action alternatives would entail less-than-significant impacts from closing the fish ladder during construction because diversion activities in the river or dewatering the reservoir would not be conducted until May 31, or when flows passing SCD are less than 50 cfs, which ever comes first. Upstream fish passage at the Dam would be completely mitigated by dam removal under Alternatives 2 and 3. Under the Proponent's Proposed Project and Alternative 1 the fish ladder

would be improved but the Dam would remain in place. Downstream fish passage impacts would continue as an existing condition for fish moving over the Dam under the Proponent's Proposed. Under Alternative 1, in addition to an improved ladder, the functional height of the Dam would be reduced by about 20 feet. Under Alternative 4, no new ladder be provided and impacts would continue consistent with existing conditions. A comparison of steelhead access issues for upstream adults or downstream juveniles or kelts moving past the dam site with proposed mitigation measures is provided in Table 2-2. Notching the OCRD would be done late in the season when movement in the river would be minimal for all the action alternatives.

Relocating the CAW water supply diversion further upstream on the Carmel River would be necessary under Alternatives 1, 2, and 3, and would affect flows downstream from the diversion point to the Dam to a less than significant level on fish after an operation plan is implemented to provide flow for steelhead. The Proponent's Proposed Project and Alternative 4 would keep the diversion where it is, so flows upstream of the Dam would not be affected.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA:

- **Issue FI-3: Operation of a Trap and Truck Facility at OCRD**. Operation of a Trap and Truck facility at OCRD has been eliminated from the fisheries impact issues. In the Draft EIR/EIS, operation of the Trap and Truck facility was proposed as mitigation for Fish Ladder Closure (Impact Issue FI-7) which was anticipated to occur in late April or May. The earliest diversion and dewatering-related actions would begin is May 31. This time frame has virtually eliminated the Fish Ladder Closure Issue and has therefore eliminated the necessity to operate a Trap and Truck facility at the ORCD.

Table 2-2: Comparison of Fish Access Issues by Alternative

ACCESS ISSUES BY ALTERNATIVE					OCRD NOTCH	
			OPERATION			
ACCESS	UPSTREAM	DOWNSTREAM	UPSTREAM	DOWNSTREAM	BOTH U/S AND D/S	BOTH U/S AND D/S
PROPONENT'S PROPOSED PROJECT	LIMITED FISH RESCUE AND RELOCATION FOR 1 YEAR	RESCUE AND RELOCATION FOR 1 YEAR	NEW LADDER	NEW LADDER AND SPILLWAY	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER
ALTERNATIVE 1	FISH RESCUE AND RELOCATION FOR2 YEARS	RESCUE AND RELOCATION FOR 2 YEARS	NEW SHORTER LADDER	NEW SHORTER LADDER AND SPILLWAY	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER
ALTERNATIVE 2	FISH RESCUE AND RELOCATION FOR 3 YEARS	RESCUE AND RELOCATION FOR 3 YEARS	RIVER	RIVER	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER
ALTERNATIVE 3	FISH RESCUE AND RELOCATION FOR 2 YEARS	RESCUE AND RELOCATION FOR 2 YEARS	RIVER	RIVER	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER
NO PROJECT	NONE	NONE	EXISTING LADDER	EXISTING LADDER AND EXISTING SPILLWAY	UPSTREAM –N/A, DOWNSTREAM RESCUE AND RELOCATION	RIVER

- **FI-9a: Sediment Impacts to Downstream Channels from Sluicing, Dredging or Sediment Transport Downstream**. This impact issue was the original FI-9 in the Draft EIR/EIS and the determination has been changed from significant, unavoidable to less than significant for the Proponent's Proposed Project, and Alternative 1. For Alternatives 2 and 3, although the long-term impact is beneficial, the short-term impact for Alternative 2 remains significant and unavoidable. The short-term impact for Alternative 3 is less than significant. The change is based on the additional analyses conducted on suspended sediment levels from sluicing to downstream channels. Impacts from exposure to suspended sediment from the Proponent's Proposed Project and Alternative 1 to downstream resources are similar to impacts that occur during storm events and would take place during storm events.

- **FI-9b: Impacts to Fish from Excavation or Dredging of Sediment for Fish Passage**. In response to comments received on the Draft EIR/EIS, the SOMP (Appendix J) has been expanded to include other methods for managing sediment, in addition to sluicing. This impact issue has been added to include impacts to fish passage upstream of the Dam that could be caused by these methods. It applies to the Proponent's Proposed Project and Alternative 1. The benthic habitat that would be dredged to maintain fish passage consists of fine sediments that have recently accumulated behind the Dam and is of very low habitat quality. These fine sediments have low invertebrate productivity and provide no spawning and limited rearing habitat. Juvenile and adult fish are known to easily avoid suction dredges (Harvey and Lisle 1998), so steelhead mortality is expected to be uncommon. The impact would be less than significant.

- **FI-12: Downstream Fish Passage over SCD**. In the Draft EIR/EIS, this issue was applied to Alternatives 2 and 3 and the determination would be beneficial because dam removal would allow unobstructed passage. However, the impact applies to passage over the existing Dam and therefore does not apply to Alternatives 2 and 3 because the Dam would be removed. This Final EIR/EIS has been revised to reflect this determination.

Vegetation and Wildlife

The Proponent's Proposed Project and all of the action alternatives affect terrestrial vegetation and wildlife habitat. The comparative acreages of vegetation (excluding water areas) affected are shown in Table 2.3. The Proponent's Proposed Project affects a relatively minor amount of vegetation (3.4 acres, not including water), while Alternatives 1 and 2 affect the most vegetation (about 41.8 acres and 61.4 acres respectively), due to the inclusion of the sediment disposal site in their totals and the additional sediment removal area for Alternative 2. Alternative 3 affects about 44.7 acres. Open water was removed from Table 2.3 to retain the focal point of the Table on vegetation affected. The No Project Alternative avoids these impacts.

Table 2-3: Vegetation Potentially Affected by Proponent's Proposed Project and Alternatives

Alternative	TOTAL	Annual grassland	Arroyo willow series	Blue oak series	Black sage series	Central Coast cottonwood-sycamore riparian forest	Chamise series	Chamise-black sage series	Coast live oak series	California sagebrush - black sage series	Developed	Emergent wetland	Mock heather scrub	Mulefat series	Mulefat-willow riparian	Ruderal	Sandbar	Sandbar annuals	California sycamore riparian-coast live oak	California sycamore riparian-mock heather scrub	California sycamore series	White alder riparian	White alder-willow riparian	Willow riparian
Proponent's Proposed Project	3.4	0.2	0.02	0.003	0.004	0.7	0.1	0.08	1.0	0.04	0.04	0	1.0	0	0	0.05	0	0	0.02	0.2	0.04	0	0	0
Alternative 1	41.8	3.8	0	0.003	0.004	1.3	0.6	0.6	20.1	0.1	0.2	0.02	0	0	0.02	0.01	0.4	1.8	0	0	0.04	0	11.9	1.0
Alternative 2	61.4	6.6	0	0.003	0.004	1.3	1.0	1.1	26.3	0.3	0.2	0.02	0	1.2	0.6	0.01	2.7	1.8	0	0	0.04	0.1	17.0	1.0
Alternative 3	44.7	7.1	0	0.003	0.1	0.2	1.5	0.3	9.6	0.0	0.04	0.02	0	1.2	0.6	0.01	2.0	1.8	0	0	0.04	0.1	18.9	1.0
Alternative 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The Proponent's Proposed Project and Alternative 1 may disrupt bat nesting areas, and Alternatives 1, 2, and 3 may displace special-status bats, due to dam-related construction. All action alternatives may affect California red-legged frogs (CRLFs). The Proponent's Proposed Project and Alternative 4 would preserve existing CRLF habitat and Alternative 1 preserves a lesser amount of frog habitat. Alternative 2 would remove habitat in the San Clemente arm and temporarily eliminate it from the sediment storage area of the Carmel River arm, but would have minimal effects on habitat upstream from the bypass channel on the Carmel River. However, the Proponent's Proposed Project and all action alternatives would include mitigation to improve CRLF habitat in areas along the Carmel River not being affected by the project, resulting in overall improvement to the CRLF community. The concrete batch plant associated with the Proponent's Proposed Project may affect horned lizards and Cooper's hawks. Brushland and riparian habitat clearing and excavation would remove some habitat for special-status species during the bypass channel excavation under Alternative 3 which would be a significant impact. Alternatives 1 and 2 would entail potential effects to terrestrial habitat and species at the sediment disposal site that the other alternatives would not required.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA:

- **WI-3 Cofferdam Construction and Plunge Pool Dewatering**: This impact issue was the original WI-3 in the Draft EIR/EIS and has been changed from significant, unavoidable to short-term, significant, unavoidable; long-term, beneficial with mitigation for all the action alternatives. Overall, it was determined that the mitigation for the CRLF as described in Appendix V, Protection Measures for Special-status Species, would enhance the habitat in the long-term compared to the existing conditions for Alternatives 1, 2, and 3. However, the impact would remain significant and unavoidable initially, for the Proponents Proposed Project and Alternatives 1, 2, and 3, because there is still the potential to impact the sensitive species and their habitat near the plunge pool dewatering in the short-term.

- **WI-7 Reservoir Drawdown without Sediment Removal**. The original WI-7 in the Draft EIR/EIS has been changed from significant, unavoidable to short-term significant, unavoidable; long-term, beneficial with mitigation. As was the case in the Draft EIR/EIS, this impact only applies to the Proponent's Proposed Project. Overall it was determined that the mitigation for the CRLF as described in Appendix V, Protection Measures for Special-status Species, would enhance the habitat in the long-term compared to the existing conditions. However, the impact would remain significant and unavoidable initially because the potential remains for short-term impacts to CRLF individuals and their habitat near the reservoir.

- **WI-9 Pre-Existing Access Road Improvements**. In the Draft EIR/EIS, this impact issue was formerly titled Cachagua Access Road Improvements, and WI-9 did not apply to the Proponent's Proposed Project. However, in the Final EIR/EIS, this

impact issue was refined to include improvements to San Clemente Drive. Widening and improving the existing access road could potentially result in minor indirect impacts to Monterey dusky-footed wood rat, pallid bat, and other special-status wildlife species. Therefore, WI-9, in the short-term, would be less than significant with mitigation described in Appendix V, Protection Measures for Special-status Species for the Proponent's Proposed Project. This does not alter impact determinations for the other alternatives reflected in the Draft EIR/EIS.

- **WI-10 Reservoir Drawdown or Elimination with Sediment Removal**: The original WI-10 in the Draft EIR/EIS has been changed from significant, unavoidable to short-term, significant, unavoidable; long-term, beneficial with mitigation. As was the case in the Draft EIR/EIS, this impact applies to Alternatives 1, 2, and 3. Overall, it was determined that the mitigation for the CRLF as described in Appendix V, Protection Measures for Special-status Species, would enhance the habitat in the long-term compared to the existing conditions. However, the impact would remain significant and unavoidable initially because the potential remains for short-term impacts to CRLF individuals and their habitat near the reservoir during reservoir drawdown with sediment removal.

- **WI-11 Sediment Removal**. The original WI-11 in the Draft EIR/EIS has been changed from significant, unavoidable to short-term, significant, unavoidable; long-term, beneficial with mitigation. Overall, it was determined that the mitigation for the CRLF as described in Appendix V, Protection Measures for Special-status Species, would enhance the habitat in the long-term compared to the existing conditions for Alternatives 1, 2, and 3. However, the impact would remain significant and unavoidable in the short-term for Alternatives 1, 2, and 3, because the potential remains for some loss either during removal of CRLFs and tadpoles, Coast Range newt larvae, and western pond turtle juveniles and hatchlings from the sediment bed before commencing vegetation removal or sediment excavation, or if individuals are missed during rescue operations.

Wetlands

The Proponent's Proposed Project and all of the action alternatives would affect wetlands and certain waters of the U.S. The comparative acreages of wetlands affected are shown in Table 2-4. The Proponent's Proposed Project would affect a relatively minor amount of wetland area and other Waters of the U.S. (about 7.8 acres). Alternative 1 affects a larger area (about 8.8 acres). Alternative 2 would affect the largest area (12.5 acres), while Alternative 3 would affect an intermediate acreage (about 10.8 acres), due to the inclusion of the sediment disposal site in their totals and the additional sediment removal area for Alternative 2. The No Project Alternative avoids these impacts. No changes were made to determinations of significant impacts from the Draft EIR/EIS. All ratios for restoration or for conservation are 3:1 in this Final EIR/EIS (in the draft EIR/EIS, some ratios were 1:1). This reflects current mitigation requirements for wetlands.

Table 2-4: Area of Waters of the U.S. and Potential Jurisdictional Wetlands Potentially Impacted by Proponent's Proposed Project and Alternatives

	Other Waters of the U.S. (acres)	Potential Jurisdictional Wetlands (acres)
Proponent's Proposed Project		
Access Road (Bridge)		0.02
Reservoir pool	6.8	
Plunge pool	0.2	0.04
Carmel River downstream of plunge pool	0.2	0.30
Tularcitos crossing	0.03	0.01
Concrete ford	0.1	0.06
TOTAL	**7.33**	**0.43**
Alternative 1		
Site 4R channel	0.12	
Access Road (Bridge)		0.02
Carmel River, San Clemente Creek, and Reservoir Pool	7.3	0.02
Plunge Pool	0.2	0.04
Carmel River downstream of plunge pool	0.3	0.6
Concrete ford	0.1	0.06
TOTAL	**8.02**	**0.7466**
Alternative 2		
Site 4R channel	0.12	
Access Road (Bridge)		0.02
Carmel River, San Clemente Creek, and Reservoir Pool	10.9	0.2
Plunge pool	0.2	0.04
Carmel River downstream of plunge pool	0.3	0.6
Concrete Ford	0.1	0.06
TOTAL	**11.62**	**0.92**
Alternative 3		
Access Road (Bridge)		0.02
Carmel River, San Clemente Creek, and Reservoir Pool	10.4	0.2
Concrete ford	0.1	0.06
TOTAL	**10.5**	**0.28**
Alternative 4		
No direct impacts		

Air Quality

All of the action alternatives would have similar effects on air quality. Alternative 2 would have the greatest effects due to the extended construction/sediment excavation schedule.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA. The effects would only occur during construction

and mitigation measures were included in the Draft EIR/EIS. However, some of the effects could contribute to exceedances of local thresholds of significance. Others may be above the level that is normally acceptable to local residential areas. Therefore even though the impact levels for these determinations are substantially the same as they were in the Draft EIR/EIS, the impact determination has been changed from less than significant with mitigation to short-term, significant and unavoidable. There would be no air quality related impacts associated with the No Project Alternative.

- **AQ-1: Dam Site Activities**. Construction activities would generate short-term emissions from diesel-powered equipment and road dust. In the Draft EIR/EIS, impacts from these emissions were determined to be less than significant with mitigation for all the alternatives; however, if not mitigated, fugitive dust could exceed the MBUAPCD construction threshold of significance[1] for $PM_{10.;}$ In addition, ambient air quality in distant residential areas or at the Dam site from NO_X emissions may be above the mass emissions significance threshold set by the MBUAPCD. Therefore, the impact determination would be short-term, significant and unavoidable for all of the action alternatives. There would be no air quality related impacts associated with the No Project Alternative.

- **AQ-2: Access Road Upgrades**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant with mitigation for the Proponent's Proposed Project and Alternatives 1, 2, and 3. However resultant dust emissions at some times and at some locations may be above what is normally acceptable to residences of Sleepy Hollow; therefore the impact determination would be short-term, significant and unavoidable. There would be no air quality related impacts associated with the No Project Alternative.

- **AQ-3: Project-Generated Traffic**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant with mitigation for all of the alternatives. However, PM_{10} emissions could exceed the MBUAPCD threshold during material deliveries and concrete placement, primarily due to travel on unpaved roads between the Filter Plant and Dam. Therefore, the resulting impact would be short-term, significant and unavoidable for all the action alternatives. There would be no air quality related impacts associated with the No Project Alternative.

Noise

All of the action alternatives would have similar effects on noise for access road upgrades and project-generated traffic even though different access routes may be used. Alternative 2 would have the greatest effects due to the extended construction/sediment excavation schedule. Residences along San Clemente Drive may be affected by construction associated with the Proponent's Proposed Project and the action alternatives resulting from the increase in noise from traffic, access road construction and improvements. Of all the action alternatives, they would experience the least volume of noise from traffic with the Proponent's Proposed Project. The batch

[1] MBUAPCD, CEQA Air Quality Guidelines, October 1995 (last revised June 2004), Figure 5-1

plant for the Proponent's Proposed Project may also impact sensitive receptors in the area. For Alternatives 1, 2, and 3, visitors to the Stone Cabin and other Jeep Trail users may also experience increased noise along Cachagua Road and the Jeep Trail. There would be no noise related impacts associated with the No Project Alternative.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA. The effects would be short-term and mitigation measures were included in the Draft EIR/EIS. However, some of the effects may be above the level that is normally acceptable to local residential areas. Therefore even though the impact levels for these determinations are substantially the same as they were in the Draft EIR/EIS, the impact determination has been changed from less than significant or less than significant with mitigation to short-term, significant and unavoidable.

- **NO-1: Dam Site Activities**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, no mitigation required for all of the alternatives. However, resultant noise levels at some times and at some locations may be above the normally acceptable range and/or more than 5 dBA above background. Therefore, the resulting impact would be short-term, significant and unavoidable for the action alternatives. Although impacts would be significant and unavoidable, these instances would be transient and short-term. There would be no noise related impacts associated with the No Project Alternative.

- **NO-2: Access Road Upgrades**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, with mitigation required for all of the action alternatives. However, resultant noise levels at some times and at some locations may be above the normally acceptable range and/or more than 5 dBA above background. Therefore, the resulting impact would be short-term, significant and unavoidable for the action alternatives. Although impacts would be significant and unavoidable, these instances would be transient and short-term.

- **NO-3: Project-Generated Traffic**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, with mitigation required for all of the alternatives. However, resultant noise levels at some times and at some locations may be above the normally acceptable range and/or more than 5 dBA above background. Therefore, the resulting impact would be short-term, significant and unavoidable for the action alternatives. Although impacts would be significant and unavoidable, these instances would be transient and short-term. There would be no noise related impacts associated with the No Project Alternative.

- **NO-4: Concrete Batch Plant Operation**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, with mitigation for the Proponent's Proposed Project and did not apply to the other alternatives. However, resultant noise levels at some times and at some locations may be above the normally acceptable range and/or more than 5 dBA above background. Therefore,

the resulting impact would be short-term, significant and unavoidable for the Proponent's Proposed Project. Receptors that could be disturbed by plant noise would be limited to two properties on San Clemente Drive that are within about 150 meters of the plant. These impacts would only apply to the Proponent's Proposed Project and would be short-term in duration and limited to the period of construction.

- **Issue NO-5: Sediment Disposal Site 4R Activities**. This issue was added because the disposal site for Alternatives 1 and 2 would be close to a recreational residence called the Stone Cabin. The spatial relationship of the Jeep Trail to the Stone Cabin would significantly reduce noise impacts on the Stone Cabin, however, given the sparsely populated rural nature of the area it cannot be determined with certainty that the impact would be less than significant; therefore the impact would be short-term significant and unavoidable.

Traffic and Circulation

All of the alternatives would have mitigable effects in creating additional traffic on the area road network. Those with the longer construction schedules and larger workforces would have the larger effects. However, under Alternatives 1, 2, and 3 during the construction of the Jeep Trail improvements, non-project related traffic traveling on the Jeep Trail would be subjected to delays of unknown duration which would be significant. None of the alternatives would significantly affect level of service at intersections. Alternatives 1, 2, and 3 would require improvements to the intersection of Cachagua Road with Carmel Valley Road. The Proponent's Proposed Project would create a new intersection on Carmel Valley Road (with the new Tularcitos Access Route). Alternatives 2, 3, and 4 would entail minor additional amounts of traffic through local residential neighborhoods on San Clemente Drive (avoided by the Tularcitos Access Route for the Proponent's Proposed Project after construction of the new route). All of the alternatives could damage pavement on local roads.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA. The effects would be short-term and mitigation measures were included in the Draft EIR/EIS. However, some of the effects may be above the level that is normally acceptable to local residential areas. Therefore even though the impact levels are the substantially the same as they were in the Draft EIR/EIS, the impact determination has been changed from less than significant with mitigation to unavoidable and significant.

- **TC-1: Road Segment Traffic Operations**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant, with mitigation required for all of the alternatives. However, Under Alternatives 1, 2, and 3, non-project related traffic using the Jeep Trail would be subjected to delays during the construction of improvements to the Jeep Trail. The impact of the project during the construction of improvements to the Jeep Trail would be short-term, significant, and unavoidable because it is not known how long of a delay a motorist would experience during the

road construction period. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-2: Intersection Traffic Operations**. In the Draft EIR/EIS, impacts related to this issue were determined to be less than significant. However, under the Proponent's Proposed Project the residents along San Clemente Drive may experience a short-term delay during AM and PM peak hours upon departure and return to their residents. Although the level of impact for this issue has not changed the determination would be short-term less than significant with mitigation to reduce the number of trips and coordinate traffic. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-3a: Traffic Safety on Carmel Valley Road**. This impact issue was originally TC-3 Traffic Safety in the Draft EIR/EIS and included traffic on Carmel Valley Road and San Clemente Drive. In the Draft EIR/EIS, Impact Issue TC-3 applied to all of the alternatives. Because of concerns expressed by residents on San Clemente Drive, the Impact Issue has been divided into two subsections. Impact Issue TC-3a addresses traffic safety on Carmel Valley Road, and the impact determination of is short-term less than significant is unchanged from the Draft EIR/EIS. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-3b: Traffic Safety San Clemente Drive**. Impact Issue TC-3b addresses addresses traffic safety on San Clemente Drive. For the Proponent's Proposed Project, mobilization and demobilization of construction equipment using San Clemente Drive are expected to occur over a period of several weeks and involve 15 to 30 trips with heavy equipment. Thereafter, 5 to 10 trips per day would occur on San Clemente Drive for worker, supervisor and maintenance access over a period of up to eight months during the construction of the Tularcitos Access Road. For Alternatives 1, 2, and 3, San Clemente Drive would be needed to provide access below the Dam, which is not accessible from the Chachagua Access Route. It is anticipated that less than 25 percent of the total construction traffic would use San Clemente Drive for access below the Dam under these alternatives. Under Alternatives 1, 2, and 3, the number of trips added to San Clemente Drive is not projected to exceed 12 trips per day. Because of the rural nature of the area, the increase in the amount of traffic on San Clemente Drive would be short-term significant and unavoidable for all of the action alternatives. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-6: Neighborhood Quality of Life**. In the Draft EIR/EIS, impacts related to this issue did not apply to the Proponent's Proposed Project and Alternative 1 and were determined to be less than significant for Alternatives 2, 3, and 4. However, For the Proponent's Proposed Project, mobilization and demobilization of construction equipment using San Clemente Drive are expected to occur over a period of several weeks and involve 15 to 30 trips with heavy equipment. Thereafter, 5 to 10 trips per day would occur on San Clemente Drive for worker, supervisor and maintenance access over a period of up to eight months during the construction of the Tularcitos Access Road. For Alternatives 1, 2, and 3, San Clemente Drive would be needed to

provide access below the Dam, which is not accessible from the Chachagua Access Route. It is anticipated that less than 25 percent of the total construction traffic would use San Clemente Drive for access below the Dam under these alternatives. The number of trips added to San Clemente Drive is not projected to exceed 12 trips per day. Although San Clemente Drive would continue to operate at LOS A, based on neighborhood quality of life level of service thresholds, this increase in amount of traffic may be noticeable to the residents. Because of the rural nature of the area, any additional traffic on San Clemente Drive would be short-term, significant and unavoidable for all the action alternatives. There would be no traffic related impacts associated with the No Project Alternative.

- **TC-7: Pavement Loadings**. In the Draft EIR/EIS Impact Issue TC-7 was determined to be less than significant with mitigation under Alternative 4. Because there would be no traffic related impacts associated with the No Project Alternative, this Impact Issue no longer applies to this alternative.

Cultural Resources

All of the action alternatives could damage cultural resources through ground disturbance, vibration, accumulation of dirt, and unintended damage. The Proponent's Proposed Project and action alternatives would each alter or remove the historic SCD. All of the action alternatives would alter (notch) OCRD, which is also a historic resource. They would also affect the character and visual integrity of the SCD historic district. These changes would affect the environment and the visual integrity of the area and would be significant and unavoidable.

In response to comments received on the Draft EIR/EIS, the following change was made in the Final EIR/EIS in the determination of significant impacts under CEQA (the impact itself has not changed).

- **CR-4: Demolition or Alteration to Historic Properties**. Under Alternatives 1, 2, and 3, notching or demolition of the historic Dam and fish ladder would be significant and unavoidable impacts that could not be fully mitigated.

Aesthetics/Visual Resources

All of the action alternatives would affect the viewsheds of neighboring areas. Residences on hills east of Carmel Valley would be able to see the operation of construction equipment. Because of the amount of traffic on Carmel Valley Road this would not be significant. Residences near the CVFP and SCD would also see construction activities. Due to the location of these residences, dam operations and maintenance activities are routine features of the landscape and the additional construction work would not be significant. Views from the San Clemente Drive residences and to users of the Stone Cabin would also change in the short-term and are discussed more fully below.

In response to comments received on the Draft EIR/EIS, additional information is provided in this Final EIR/EIS which clarifies and amplifies the following determinations of significant impacts under CEQA. The effects would be short-term and mitigation measures were included in the Draft EIR/EIS. However, some of the effects may be above the level that is normally acceptable to local residential areas. Therefore even though the impact levels are substantially the same as they were in the Draft EIR/EIS, some of the impact determinations have been changed from less than significant or less than significant with mitigation to short-term, significant and unavoidable.

- **VQ-1: Residential Views on Hills East of Carmel Valley Road**. An error was corrected in Table 2.1: in the Draft EIR/EIS, the table indicated a less than significant impact for Issue VQ-1 under Alternative 1; however this issue does not apply to Alternative 1 because the Tularcitos Access Route would not be constructed under this alternative.

- **VQ-3: Changes to the Viewsheds from Residences in Sleepy Hollow Subdivision**. This issue was erroneously coded as "does not apply" to the Proponent's Proposed Project and to Alternative 1 in the Draft EIR/EIS. It does apply to both alternatives. For the Proponent's Proposed Project, it refers to the views of the concrete batch plant which residents say would be visible from two of the residences. Although it is uncertain whether it can be seen from these residences, because of the rural nature of the area, this impact would be a short-term, significant unavoidable; impact, with no mitigation available. The Impact Issue also applies to Alternative 1, but would be short-term, less than significant. As with Alternative 2 and 3 the issue describes views of construction equipment passing through the Subdivision during normal working hours during the construction period.

- **VQ-4: Changes to Viewsheds from the Stone Cabin**. This issue was added in response to comments received during review of the Draft EIR/EIS. It documents a short-term less than significant impact and a long-term beneficial impact under Alternatives 1, 2, and 3; and does not apply to the Proponent's Proposed Project and Alternative 4.

- **VQ-5: Changes to Viewsheds from the Jeep Trail**. This issue was added in response to comments received during review of the Draft EIR/EIS. A short-term, significant and unavoidable impact to those traveling on a short segment of the Jeep Trail would occur during the period of sediment disposal operations and revegetation and long-term less than significant with mitigation under Alternatives 1 and 2. It would not apply to the Proponent's Proposed Project or Alternatives 3 or 4.

Recreation

The Draft EIR/EIS addressed recreation in a general chapter on "other environmental effects." For the Final EIR/EIS, a new section has been created to address recreation in more detail, responding to comments raised in public review. The following issues are addressed in this section:

- **REC-1: Access to the Stone Cabin via the Jeep Trail**. This issue documents a change in design made in response to comments. The location of the Site 4R disposal site inadvertently blocked access to the Stone Cabin via the Jeep Trail. The proposed design for Site 4R in the Final EIR/EIS relocates the site slightly uphill to avoid this impact and provides a sediment conveyor overcrossing. Impact Issue REC-1 would be short-term, less than significant for Alternatives 1 and 2 and would not apply to the Proponent's Proposed Project or Alternatives 3 or 4.

- **REC-2: Disruption of Use of Jeep Trail to Stone Cabin**. Travel by recreational users on the Jeep Trail would be disrupted at various times during the period of construction for Alternatives 1, 2, and 3. This would be a short-term, significant, and unavoidable impact.

- **REC-3: Rerouting or Restoring the Carmel River Channel**. This issue documents the beneficial impacts of river restoration under Alternatives 1, 2, and 3.

- **REC-4: Deposition of Sediment on Site 4R**. This impact applies to the two alternatives that would use Site 4R (Alternatives 1 and 2) and would be short-term, significant unavoidable; long-term, less than significant with mitigation (site restoration).

Land Use

The Draft EIR/EIS addressed land use in a general chapter on "other environmental effects." For the Final EIR/EIS, a new section has been created to address land use in more detail, responding to comments raised in public review. None of the project alternatives would pose a long-term conflict with existing plans and policies.

A short-term, significant and unavoidable impact would occur for the alternatives that require the use of Site 4R (Alternatives 1 and 2), because existing park land would be used for sediment disposal. This impact would be reduced to less than significant in the long-term by revegetation.

Environmental Justice

None of the alternatives would have significant effects on environmental justice. No changes in the determination of significant impacts under CEQA were made based on comments received on the Draft EIR/EIS.

2.4 AREAS OF KNOWN CONTROVERSY AND ISSUES TO BE RESOLVED

The Proponent's Proposed Project and action alternatives address all areas of known controversy. During the CEQA process, the issues of fish passage, sediment management, and construction-related traffic became areas of controversy. The design of these alternatives is intended to resolve existing issues in these areas.

Previous areas of known controversy and issues to be resolved that led to the Proponent's Proposed Project and culminated in the previous CEQA process are described in Section 1.6, Project History. The initial issue to be resolved concerned dam safety (ability to withstand the MCE and PMF). From 1980 to 1992, several investigations were conducted leading to the conclusion that the Dam would not withstand the MCE or PMF. The DWR/DSOD directed CAW to proceed with a project that would remove dam safety deficiencies, which led to the preparation of the original CEQA EIR in 1998. This issue is addressed by the Proponent's Proposed Project and all action alternatives.

During the CEQA process, the issues of fish passage, sediment management, and construction-related traffic became areas of controversy. Fish passage issues are addressed by the proposed replacement of the fish ladder (Proponent's Proposed Project, Alternative 1) or removal of the Dam (Alternatives 2 and 3). For the alternatives that retain the Dam (Proponent's Proposed Project and Alternative 1) sediment management is addressed through sluicing or dredging (Proponent's Proposed Project and Alternative 1). The effects of sediment management, including sluicing operations under the Proponent's Proposed Project and Alternative 1 have been addressed in an updated SOMP (Appendix J) and in updates to Chapters 4.2 and 4.4 of this Final EIR/EIS. These updates respond to concerns raised by NMFS and others regarding impacts to steelhead, a listed species, that may result from proposed sluice gate operations, due to increased suspended sediment concentrations in the Carmel River below the Dam. Other concerns addressed were potential effects to steelhead survival, spawning, rearing, and migration and to adult fish due to fallback through the sluiceway and fish passage above the Dam. Even though all of the action alternatives would affect steelhead larvae and juveniles during construction, all of the action alternatives, including the Proponent's Proposed Project, improve conditions for steelhead from the baseline conditions.

Concerns were expressed that some of the action alternatives might adversely affect the CRLF, another listed species. However, with mitigation and enhancement activities, all of the action alternatives would maintain or improve the existing habitat for the CRLF.

Sediment disposal management issues are addressed either by offsite storage (Alternatives 1 and 2) by means of a conveyor belt or in place stabilization (Alternative 3) for the Dam removal alternatives. For Alternatives 1 and 2, the identified sediment disposal site is located on Regional Park lands and close to an historic residential cabin. While the disposal site could create a short-term adverse visual impact, the only current users close to the site are the users of Stone Cabin. After disposal is completed, the site would be restored and the access road would, at the discretion of the Regional Park District, either be returned to its original condition or left in its improved state. No transportation of sediment would be done using roads.

Construction traffic issues relate to air quality, noise, aesthetics, traffic circulation, and traffic safety. They are addressed by the development of access alternatives that

minimize construction traffic through existing neighborhoods. For the Proponent's Proposed Project, San Clemente Drive would be used for approximately eight months until the new Tularcitos Access Road is built which would bypass Sleepy Hollow Subdivision. Alternatives 1, 2, and 3 would use Cachagua Road and an improved Jeep Trail for most of the necessary construction work. San Clemente Drive would continue to be used about 25 percent of the time to reach areas that are not accessible from the Chachagua Access Route. Both access routes are located in rural areas that experience little traffic other than from the residents. For this reason, the Final EIR/EIS considers many of the traffic-related impacts unavoidable and significant. However, the impacts would be short-term (only during construction) and would often be temporary and intermittent. In addition, a number of mitigation measures would be included in all the action alternatives that are designed to control the extent, the timing and the adverse impacts of construction traffic.

2.5 SUMMARY OF SIGNIFICANT EFFECTS AND MEASURES OR ALTERNATIVES TO REDUCE OR AVOID EFFECTS

Significant, unavoidable effects of the San Clemente Dam Seismic Safety Project and the No Project Alternative are summarized in Section 5.1. Other significant effects were identified, but can be reduced to less than significant or avoided by the mitigation measures specified in this EIR/EIS. These are summarized below:

Geology & Soils

There is a risk of landslides or slope instability along access roads. This can be mitigated through BMPs relating to geotechnical design of the road improvements. Soil erosion may occur along access road improvements leading to sediment discharge into watercourses. This can be mitigated through implementation of the Storm Water Pollution and Prevention Plan (SWPPP) (preliminary draft in Appendix K).

Hydrology and Water Resources

Under the Proponent's Proposed Project and Alternative 1, the SOMP would be used to regulate downstream sediment releases. Neither of these alternatives would have significant and unavoidable effects on sediment flows, storage, composition, deposition, suspended sediments, channel geometry, or the 100-year flood elevation. Implementation of the SOMP and water quality BMPs included in the SWPPP (Appendix K) would reduce any impacts to levels less than significant.

Under Alternatives 2 and 3, sediments could be mobilized and transported by the Carmel River and San Clemente Creek as they move through their restored channels in the areas exposed by excavation and as they reestablish channels traversing the newly-excavated sediment wedge. This could increase sediment flux passing the SCD site, downstream sediment composition and sediment storage in the Carmel River, and the channel geometry and floodplains of the Carmel River.

Water Quality

Sluicing under the Proponent's Proposed Project and Alternative 1 would lead to increases in turbidity in the Carmel River below the Dam that would be short-term, significant and unavoidable. The SWPPP, referred to under Geology and Soils, would be implemented to mitigate potentially significant effects to water quality from many project-related construction activities. These activities include: sediment discharge to watercourses during road construction and improvement; increased turbidity caused by disturbance of streambeds; accidental spills and leaks of toxic substances; fine sediments and toxins in return water after stream diversions; increased temperature and turbidity and decreased dissolved oxygen in water discharged from settling basins; and increased turbidity and release of toxic substances during construction of the OCRD notching and OCRB improvements and SCD construction or demolition. In addition, energy dissipation structures would be used to mitigate localized scour, sedimentation and turbidity when returning bypassed flows from stream diversions. Pipeline design, monitoring, filtering and mixing cooler, cleaner water would mitigate increased turbidity, decreased dissolved oxygen, and increased temperatures from dewatering the reservoir and carrying flows from stream diversions to the downstream river.

Fisheries

Construction related impacts occur for the Proponent's Proposed Project and the alternatives relating to impairment of upstream migration and effects from road and bridge construction on steelhead habitat in the Carmel River. Dewatering upstream channels, the reservoir and the plunge pool would cause short-term, unavoidable loss of fish and fish habitat for each construction season. These would be mitigated by annual fish rescues and relocation. Mitigation also includes water quality protection measures, stream channel restoration or recontouring, limits on tree and limb removal, measures to preclude roadfill from entering streams, streamside revegetation, and erosion control measures. Impacts to upstream fish passage would be mitigated by the construction of an improved fish ladder under the Proponent's Proposed Project and Alternative 1. Stream diversions under Alternatives 1, 2, and 3 would be mitigated by limiting the timing and amount of diversions in the Carmel River, and by an operations plan to provide flows for steelhead. Impacts associated with sediment removal and new river channels would be mitigated for Alternatives 1, 2, and 3 by river channel reconstruction and riparian revegetation.

Vegetation and Wildlife

Avoiding populations of CNPS List 4 species would mitigate the loss of special-status plant species under the Proponent's Proposed Project and all alternatives. Oak woodland would be avoided or mitigated through fencing and the implementation of a Revegetation Plan that provides for 3:1 replacement, plantings, monitoring, conservation easements, irrigation, and protection from browsing. Loss of other native vegetation would be mitigated by designing facility and access footprints to minimize loss; fencing; diffusing project outflows to minimize erosion; applying supplemental irrigation; and implementing a Revegetation Plan. Indirect effects to native vegetation

would be mitigated by BMPs for erosion control (SWPPP, Appendix K); minimizing changes to existing drainage patterns; avoiding work within tree driplines; dust control; revegetation; and monitoring.

Effects on special-status wildlife and their habitat would be mitigated through preconstruction surveys, rescue and relocation operations, predator control, CRLF habitat enhancement, and the development of other measures through consultation based on the results of surveys (details provided in preliminary draft of the Protection Measures for Special-status Species, Appendix V). Bat roosts, hawk nests, and woodrat nests would be avoided. Short-term barriers would be installed to prevent relocated species from reentering work areas. Biological monitoring would be conducted to allow for adaptive management of mitigation measures. Restrictions on vegetation clearing practices would protect vulnerable amphibians.

Wetlands

Impacts from the Proponent's Proposed Project and Alternatives 1, 2, and 3 to wetlands and other waters of the U.S. would be mitigated by the implementation of a Restoration, Mitigation & Monitoring Plan (Appendix U). Wetlands similar in function would be restored at a 3:1 ratio. Conservation easements on similar, unaffected and fully functional wetlands would be undertaken at a 3:1 ratio. Other waters would be restored or conserved at a 3:1 ratio. Cofferdams would be mitigated by criteria regulating their timing of placement and construction. The plunge pool staging area would be protected by construction BMPs and replacement plantings would be undertaken at a 3:1 ratio.

Air Quality

Construction or demolition activities at the dam site would generate fugitive dust (PM_{10F}), as would access road improvements and project-related traffic. These impacts would be mitigated by a variety of BMPs for dust suppression, such as watering, chemical stabilization and the provision of a point of contact for local residents to obtain corrective action when dust impacts occur.

Noise

Access road improvements and project-generated traffic would increase noise levels above acceptable levels at sensitive receptors located along access routes and in the Sleepy Hollow neighborhood. These impacts would be mitigated by using quiet-design construction equipment, mufflers, and enclosures; eliminating unnecessary idling; equipment maintenance and lubrication; timing restrictions for equipment use; low speed limits; and restrictions on timing of worker travel and truck deliveries.

Traffic

The Proponent's Proposed Project and all alternatives would add a significant level of traffic to the area road network. This would be mitigated by development of a Construction Management Plan to reduce the number of vehicles and their interaction with other vehicles and promote safety, and a Traffic Coordination and Communication

Plan that includes traffic coordination, trip reduction, and traffic safety, flagging, and the escort of transport trucks. The Traffic Coordination and Communication Plan would include procedures for distributing the schedule of construction activities to the other users of the Jeep Trail. Procedures would be included in the Plan that would minimize the delay to non-project related Jeep Trail users during construction of improvements to the road as well as during subsequent project activities. Increased traffic also increases the potential for an increase in accidents. Additional mitigation would include funding additional enforcement and widening Cachagua Road (Alternatives 1, 2, and 3). Potential impacts due to inadequate corner site distances would be mitigated by improvements constructed at the affected intersections. Repairing damage to affected roads immediately after construction is completed would mitigate project-related traffic effects on pavement.

Cultural Resources

Ground disturbance that could affect archaeological resources would be avoided by construction monitoring, or mitigated by archeological evaluation or historical documentation. Unavoidable impacts due to demolition or alteration of historic structures and the character and visual integrity of their setting would be reduced by documentation, preparation of a Historic Preservation Management Plan, Historic American Building Survey/Historic American Engineering Record (HABS/HAER) recordation, interpretive displays, educational programs, photographic documentation, and use of compatible design, materials, and construction methods.

Visual Resources (Aesthetics)

Visual effects would be largely short term and less than significant without mitigation. Short term significant effects to travelers on the Jeep Trail would be caused by sediment disposal at Site 4R. These effects would be partly mitigated by screening and, in the longer term, by revegetation. Short-term significant effects would also be experienced by residences in the Sleepy Hollow subdivision. There is no mitigation for these effects although mitigation for traffic impacts would coordinate traffic activity to reduce circulation and limit these impacts to daytime use.

Land Use

Conflicts with existing plans and policies of Monterey County would be avoided by consultation with Monterey County during project permitting. Although use of Site 4R for sediment disposal has been moved so that it does not block access to the Stone Cabin, there would still be some short-term significant and unavoidable impacts to the MPRPD due to use of the Jeep Trail during the construction period by Alternatives 1, 2, and 3. These short-term impacts would be reduced by consultation with the MPRPD. There are no long-term impacts. Following construction, the road would be restored to its pre-project condition or left in its improved condition based on consultation with MPRPD

Recreation

Short-term significant and unavoidable effects due to disruption of recreational access via the Jeep Trail would be partly mitigated by restricting the times of operation for heavy equipment. Short-term significant and unavoidable effects due to deposition of sediment at Site 4R would be mitigated by restoration of the site.

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CHAPTER 3.0

DESCRIPTION OF THE ALTERNATIVES

3.0 DESCRIPTION OF THE ALTERNATIVES

3.1 OVERVIEW

3.1.1 SUMMARY OF PROJECT/ACTION ALTERNATIVES

No "preferred alternative" has been designated by the Lead Agencies. The Proponent's Proposed Project is dam strengthening with in-place sediment stabilization (under the National Environmental Policy Act (NEPA), this is termed the "proposed action"). The following alternatives to the Proponent's Proposed Project were considered in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS):

- Alternative 1 Dam notching with partial sediment removal
- Alternative 2 Dam removal with total sediment removal
- Alternative 3 Carmel River reroute and dam removal with in-place sediment stabilization
- Alternative 4 No Project

These alternatives are summarized in Chapter 2 and described in detail below. The Proponent's Proposed Project and alternatives include site access, sediment removal and disposal, fish passage, and water diversion. The project and its alternatives meet the requirement of increasing the safety of San Clemente Dam (SCD) to meet design criteria for withstanding a Maximum Credible Earthquake (MCE) and passing a Probable Maximum Flood (PMF).

Table 3.1-1 presents a summary of the comparative costs of the Proponent's Proposed Project and action alternatives. The table includes construction as well as operation and maintenance costs. These totals include escalation, engineering, management, administrative, mitigation and permitting costs; they do not include financing costs. Costs are escalated to the year 2009 at 12 percent per year, except in the case of Alternative 2, which will require an additional year for construction and is escalated to 2010. These costs are preliminary and are expected to change.

The California American Water Company (CAW) is currently exploring funding strategies for the action alternatives. In general, CAW would seek approval from the California Public Utilities Commission (CPUC) for recovery through water sales revenues of the cost of any project it must carry out to meet regulatory requirements. However, the CPUC will not rule on which costs may be included in the rate base until such a rate hearing occurs.

Table 3.1-1: San Clemente Dam Seismic Safety Project Alternative Cost Comparison Table

Cost Breakdown	Proponent's Proposed Project Dam thickening	Alternative 1 Dam Notching	Alternative 2 Dam Removal	Alternative 3 Carmel River Bypass and Dam Removal
Construction Field Costs	$19,477,000	$37,259,000	$43,775,000	$31,192,000
Operation & Maintenance Costs	$1,000,000	$1,200,000	$ 200,000	$200,000
Subtotal Cost	$20,477,000	$38,459,000	$43,975,000	$31,392,000
Cost + 25% Contingency	$25,596,000	$48,738,500	$56,076,000	$39,240,000
Construction Cost + 25% Contingency and Escalation	$35,960,537	$68,474,083	$88,236,672	$55,129,375
Implementation Cost	$13,000,000	$27,000,000	$30,000,000	$20,000,000
Total Cost	$49,000,000	$95,000,000	$118,000,000	$75,000,000

Notes:

1 Financing costs are not included.

2 Total costs are rounded to the nearest $1,000,000.

3 Construction costs are escalated at 12 percent to 2009 $ for all alternatives except Alternative 2, where the total cost is escalated to 2010 $. Source: California Department of Transportation (Caltrans) Highway Construction Cost Index, 2nd Quarter, 2006

4 Implementation costs include engineering, management, administrative, mitigation, and permitting costs.

No other feasible funding source or strategy for the dam notching (Alternative 1) or dam removal (Alternative 2) has been identified to date. For the Carmel River reroute (Alternative 3), the State of California has indicated a preliminary interest in funding the project under a scenario in which CAW would turn over the project and property surrounding the Dam to the California Coastal Conservancy, plus contribute a share of the funding.

Access Alternatives

An evaluation of the possible access routes for project construction was conducted and the results are summarized below in Table 3.1-2 which presents the use of various access routes by alternative, and the level of improvements planned.

For the Proponent's Proposed Project (Dam Strengthening), the Tularcitos Access Route was selected. For Alternative 1 (Dam Notching), Alternative 2 (Dam Removal), and Alternative 3 (Carmel River Reroute and Dam Removal), the Cachagua Access Route would be the primary route providing access above the Dam, to mobilize equipment, excavate sediment, and move sediment to disposal areas.

The Proponent's Proposed Project would use the section of San Clemente Drive from Carmel Valley Road through Sleepy Hollow (to the point where it intersects with the new Tularcitos Access Route) only until the Tularcitos Access Route is complete (approximately eight months during CY 3). It would also use the section of San Clemente Drive from the Tularcitos Access point for access to the Dam.

Table 3.1-2: Access Routes Used by Alternative

Roadway	Proponent's Proposed Project	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Carmel Valley Road	minor improvement, major arterial serving all access routes	minor improvement, major arterial serving all access routes	minor improvement, major arterial serving all access routes	minor improvement, major arterial serving all access routes	no improvements, existing levels of use
San Clemente Drive	minor improvements for initial access until Tularcitos completed (approximately two months of CY 3)	minor improvements for secondary access below dam, mobilization, demobilization	minor improvements for secondary access below dam, mobilization, demobilization	minor improvements for secondary access below dam, mobilization, demobilization	no improvements, existing levels of use
Tularcitos Road	new permanent road, primary access				
Cachagua Road (part of Cachagua access route)		permanent improvement, primary access	permanent improvement, primary access	permanent improvement, primary access	no improvements, existing levels of use
Jeep Trail (part of Cachagua access route)		substantial permanent improvements, primary access	substantial permanent improvements, primary access	substantial permanent improvements, primary access	
Road from Jeep Trail to Reservoir & Dam (part of Cachagua access route)		new temporary road, primary access	new temporary road, primary access	new temporary road, primary access	

Alternatives 1, 2, and 3 would use San Clemente Drive from Carmel Valley Road through Sleepy Hollow to reach areas below the Dam which would not be accessible from the Cachagua route. These alternatives will use San Clemente Drive for initial mobilization of equipment needed below the Dam at the beginning of the project and demobilization of this equipment at the end of the project. San Clemente Drive would also be used to provide access below the Dam for construction workers, and occasionally during the project for trucks carrying supplies or equipment. This access route was selected over the Tularcitos Access Route for these alternatives to avoid potential impacts on terrestrial biology. More than 75 percent of the traffic associated with these alternatives is associated with work above the Dam (e.g., construction of the reroute, sediment removal, and dam removal). Periods of mobilization and demobilization using the San Clemente Drive route are expected to occur over a period of several weeks and involve 15-30 trips with heavy equipment during that period. The access routes are described briefly below:

San Clemente Drive Access Route

This access route following San Clemente Drive through Sleepy Hollow was originally proposed and analyzed in the 2000 RDEIR (Denise Duffy & Associates 2000). This existing access route includes San Clemente Drive from Carmel Valley Road through the Sleepy Hollow Community, plus the unimproved High Road and Low Road to the top of the Dam, the unimproved plunge pool road to the base of the Dam, and other unimproved roads serving existing CAW facilities such as the Carmel Valley Filter Plant (CVFP). Minor improvements will be made to San Clemente Drive to accommodate the planned use of this route as described above.

Tularcitos Access Route

This route was also briefly analyzed as a CEQA Alternative in the 2000 RDEIR (Denise Duffy & Associates 2000). This route includes most of the route of the Proposed Project access, but diverges south of the houses on San Clemente Drive and would intersect Carmel Valley Road approximately 750 feet west of San Clemente Drive. This route also includes construction of a new crossing of Tularcitos Creek via a steel truss bridge with a span of approximately 200 feet, with a wood deck and concrete abutments.

Cachagua Access Route

This access route follows Cachagua Road from Carmel Valley Road to an existing 4WD road (the “Jeep Trail”) leading to sediment disposal Site 4R. The sediment site is accessed via a conveyor belt system from San Clemente Reservoir. A new temporary road would be built to connect the Jeep Trail to the reservoir and dam.

3.1.2 ALTERNATIVES CONSIDERED AND ELIMINATED

Dam Alternatives

Dam Strengthening

A 1997 *Design Memorandum on Structural Improvements for San Clemente Dam* (SCD) by Woodward Clyde Consultants (WCC) described a number of alternatives for dam strengthening. WCC eliminated some of these and others were evaluated and eliminated in the previous California Environmental Quality Act (CEQA) process. These alternatives and the reasons for eliminating them are:

POST-TENSIONED TENDONS

Installation of 8 post-tensioned tendons spanning horizontally between the abutments and bearing against the upstream face of the Dam. This alternative would require draining the reservoir every 5 years to test the long-term pre-stressed load in each tendon. The test would entail essentially the same procedures and equipment used to initially tension the tendons and would be expensive. This complex concept was eliminated due to serious construction, cost, and maintenance issues.

ARCH BEAMS

Construction of reinforced concrete beams on the downstream face of the Dam to provide partial support. The effect on reduction of stress during a MCE was minimal. This concept was eliminated as infeasible.

ARCH BEAMS WITH BUTTRESS SUPPORT

Construction of two horizontal arch beams supported by buttresses on the downstream face of the Dam. This concept was eliminated because it could impair fish ladder performance.

ARMORING

Armoring with shotcrete to increase dam stiffness and strength. This concept was eliminated because it would be ineffective in providing protection against the MCE and therefore would not meet project purpose and need.

ROLLER COMPACTED CONCRETE

Construction of a roller compacted concrete gravity section against the downstream face of the Dam. This alternative was eliminated due to significant environmental impacts due to encroachment into existing wetlands on the downstream side of the Dam (as compared to other dam strengthening alternatives that would not cause comparable impacts).

REMOVAL OF DAM SUPERSTRUCTURE

Removal of dam superstructure (including gates, piers, and walkways) to reduce dam stresses. This concept was eliminated because, although it would significantly reduce stress on the Dam, The Dam would still exceed acceptable stress levels and would require further notching to fully meet project purpose and need.

New San Clemente Reservoir

Construction of a new 23,000 to 29,000 acre feet (AF) reservoir that would inundate the existing dam and reservoir was proposed by Monterey Peninsula Water Management District (MPWMD). This concept was eliminated in February 1989 when State and Federal regulatory agencies rejected the MPWMD EIR/EIS as inadequate and indicated that the new reservoir may be infeasible due to extensive environmental impacts.

Dam Removal

An extensive review of dam removal literature was provided as part of the previous Recirculated Draft EIR (Denise Duffy & Associates 2000). The material in that Draft, as well as more recent work, was considered in preparing Alternatives 2 and 3, which would remove SCD.

Dam Removal through Notching and Localized Sediment Management

This concept was developed by the Institute for Fisheries Resources through an independent community process. Under this concept, the Dam would be notched, the area downstream of the Dam would be filled, and sediments behind the Dam would be dredged to construct a series of terraces stabilized with walls upstream and downstream of the Dam. A graded ramp would be constructed upstream of the Dam at a slope of approximately one percent until the old streambed is intersected. A graded ramp would be constructed downstream of the Dam at a slope of approximately 4 percent beginning at the Old Carmel River Dam (OCRD) until the profile reaches the level of the notched dam. Although the concept was intended to provide a stable, fish-friendly solution, it was eliminated due to engineering concerns about its stability and regulatory agency concerns that it would create multiple barriers to fish passage and would fill waters of the U.S. in the channel below the Dam.

Access Alternatives

As part of the SCD Seismic Safety Project EIR/EIS, a preliminary screening analysis was conducted for the potential major access routes to and from SCD. The purpose of the screening analysis was to choose one preferred access route to be used with each dam alternative described in the EIR/EIS. The preliminary access route screening analysis is provided as Appendix F to the EIR/EIS. Four potential major access routes were considered in the screening analysis: the Sleepy Hollow (now identified as the San Clemente Drive access) Route, the Sleepy Hollow Homeowners Association (SHHA) Proposed Route, the Tularcitos Route, and the Cachagua Route.

Based on the preliminary access route screening, all access routes that would entail the use of trucks to haul sediment from the reservoir were eliminated. A sediment site was selected that could be accessed by a conveyor belt system from the Dam. For the two alternatives that require sediment transport and disposal (Alternatives 1 and 2), the Cachagua route would be used to access the sediment site during site preparation and construction of the conveyor belt system.

For the Proponent's Proposed Project (Dam Strengthening), the Sleepy Hollow route was eliminated due to the potential impacts of truck traffic to a rural residential community, including safety concerns and impacts to pavement structure. The SHHA route was eliminated due to potential impacts to undisturbed riparian vegetation and habitat for sensitive species.

For access below the Dam under Alternative 1 (Dam Notching), Alternative 2 (Dam Removal), and Alternative 3 (Carmel River Reroute and Dam Removal), the Tularcitos Access Route was eliminated due to its greater biological impacts and because these alternatives used the Cachagua Access Route for a substantial part of the alternative's access needs.

A fifth access route called the Stone Pine Route was eliminated as a feasible option early in the environmental review process due to known environmental and physical constraints, including significant impacts to biological resources, a major river crossing, construction in a sensitive riparian habitat near listed species, higher costs, and regulatory uncertainty.

The eliminated access routes are described briefly below:

Sleepy Hollow Homeowner's Association (SHHA) Route

This access route alternative was proposed by the Sleepy Hollow Homeowner's Association and briefly analyzed as a CEQA Alternative in the 2000 RDEIR (Denise Duffy & Associates 2000). The route follows the Sleepy Hollow Route, diverging south of the residential area on San Clemente Drive and intersecting Carmel Valley Road approximately 3300 feet west of San Clemente Drive. This route also includes construction of a new crossing of the Carmel River.

Stonepine Access Route

This alternative was proposed to use the existing Stonepine neighborhood intersection with Carmel Valley Road at a point approximately two miles west of San Clemente Drive. This route would have required improvement of the existing Stonepine Bridge or the construction of a new bridge across the Carmel River and a roadway within an active floodplain.

Sediment Management Alternatives

A variety of alternatives have been considered to remove and dispose of sediment. Some were considered and eliminated earlier in the CEQA process and others were eliminated in an engineering screening and environmental constraints analysis done for the EIR/EIS. San Clemente Reservoir has been estimated to contain approximately 2.5 million cubic yards of sediment (Mussetter Engineering, Inc. [MEI] 2003). Montgomery, Watson and Harza (MWH) performed an engineering screening analysis of potential sediment disposal sites (Appendix G, Screening of Sediment Disposal Sites) and ENTRIX performed an environmental constraints analysis of the sites identified by MWH. The purpose of the screening analyses was to recommend selection of potential sediment disposal site(s) for use with Alternatives 1 and 2 (Dam Notching and Dam Removal). The required sediment disposal capacity for the Dam removal Alternative is approximately 2.5 million cubic yards. For the Dam notching Alternative, the estimated volume of sediment to be removed is approximately 1.5 million cubic yards (MEI 2005). The sediment transport and disposal Alternatives are described and the results of engineering screening are presented in Appendix G. The results of the environmental constraints analysis for the sediment transport and disposal Alternatives are presented in Appendix H. Those alternatives that were considered and eliminated are briefly summarized below.

Removal and Conveyance of Sediment

EXCAVATION AND CONVEYANCE BY SLURRY PIPELINE TO SEDIMENT DISPOSAL SITE

This conveyance alternative was eliminated due to the consumption of water that would have been required (as compared to the conveyor belt alternative, which would not consume water).

EXCAVATION AND CONVEYANCE BY TRUCK TO SEDIMENT DISPOSAL SITE

This conveyance alternative was eliminated due to large potential impacts to roads and bridges, traffic, safety, and residential communities along the truck haul route.

CONVEYANCE OF SEDIMENT IN NATURAL STREAM CHANNEL TO OCEAN

The previous CEQA process considered alternatives that allow uncontrolled release of the accumulated sediment in the reservoir for conveyance in the natural stream channel to the ocean. This alternative was eliminated due to significant and unavoidable downstream potential stream impacts to fish, aquatic habitat, floodplains and flooding; potential effects of sedimentation in the Carmel River estuary; and potential marine impacts to Monterey Bay National Marine Sanctuary.

Disposal of Sediment

DISPOSAL IN LANDFILL

Three landfill sites were considered and eliminated during the engineering and environmental screening. Sites 1 and 2A were paired to provide the full capacity required to process all of the sediment contained in the reservoir. These sites were eliminated because their capacities would have only marginally accommodated the required sediment volume, they impact known cultural resources, and they have incompatible neighboring land uses and visual impacts. Site 6R required a relatively long sediment haul route traversing residential areas and Carmel Valley Road. This alternative was eliminated due to traffic and safety impacts caused by truck haul, or the greater energy or water consumption required for the slurry pipeline or conveyor belt sediment conveyance.

OTHER SITES PREVIOUSLY IDENTIFIED

Other potential sediment disposal sites identified in a previous mapping study (California Department of Water Resources [DWR] 2002) include those referred to as Sites 2B through 2E, 3 and 5. These sites were only briefly considered and dismissed from further evaluation for purposes of the screening study. Sites 2B through 2E are small and of limited (and insufficient) capacity. Site 3 is located on a box canyon upstream of the Dam and is thus somewhat comparable to Site 4R. However, Site 3 is much farther from the reservoir and at a much higher elevation than Site 4R. Therefore, other factors being equal, disposal of sediment at Site 3 would be significantly more

costly than at Site 4R. Lastly, Site 5 consists of a steep slope overlooking Carmel River and appears to be unsuitable for sediment storage.

STAGING AND EXPORT FOR SALE

MWH conducted an investigation of the commercial value of sediment in San Clemente reservoir (Appendix I). The study concluded that cost-effective development of mineral resources in the sediment now stored in San Clemente Reservoir does not appear to be feasible at this time. While the sediment could be processed into products that have commercial value, this value is completely offset by the incremental processing and transportation costs involved. There is not a positive benefit-cost ratio for selling the sediment based on current market conditions.

Dam/Sediment Management Alternatives Considered During Previous CEQA Review

The RDEIR (Denise Duffy & Associates 2000), issued in 2000 considered nine combined dam/sediment management alternatives. However, the RDEIR did not compare the environmental impacts of these alternatives or provide reasons for eliminating them. Several of these alternatives have been carried forward in this EIR/EIS, which captures the range of alternatives without unnecessarily multiplying alternatives.

MITIGATED RETROFIT WITH SEDIMENT MANAGEMENT

This alternative combines the proposed dam thickening project with sediment management through the operation of two high-level sediment ports with sluice gates, management of sediment transport past the Dam and downstream, and spot dredging. This alternative is similar to the Proponent's Proposed Project considered in this EIR/EIS.

NOTCHING WITH DREDGING

Under this alternative the Dam superstructure would be removed and the Dam would be notched to an elevation of 506 feet and a lower fish ladder would be constructed. Sediments accumulated behind the Dam would be dredged to prevent uncontrolled downstream release. This alternative is essentially the same as Alternative 1 considered in this EIR/EIS.

NOTCHING WITHOUT DREDGING

This alternative is identical to the preceding alternative except that dredging would not be performed. This alternative has been eliminated due to the potential impacts from sedimentation, loss of channel stability, and flooding and impacts to fish habitat and the California red-legged frog (CRLF) associated with an uncontrolled release of sediment downstream.

NOTCHING WITH SEDIMENT MANAGEMENT AND SMALL RUBBLE DAMS

This alternative combines dam thickening (the Proponent's Proposed Project considered in this EIR/EIS) with sluice gates installed in two phases. Sediment accumulated behind the reservoir would be dredged, barged, and sluiced at double the throughput rate. The Dam would be notched to 506 feet and a lower fisher ladder would be constructed. A series of rubble dams would be installed between SCD and OCRD to provide grade control and fish passage. This alternative was considered and eliminated due to long-term significant adverse impacts to fish (over a 40-year period) before the design would provide stable fish passage and stream habitat.

DAM REMOVAL WITH DREDGING

This alternative involves dredging of accumulated sediments followed by removal of the Dam by breaching the spillway to an elevation of 457 feet. This alternative is essentially the same as Alternative 2 considered in this EIR/EIS.

PHASED DAM REMOVAL WITHOUT DREDGING

This alternative is identical to the preceding alternative except that dredging would not be performed. This alternative was eliminated due to the potential impacts from sedimentation, loss of channel stability, flooding and impacts to fish habitat and the CRLF associated with an uncontrolled release of sediment downstream.

COMPREHENSIVE DAM REMOVAL WITH SEDIMENT MANAGEMENT

This alternative provides a phased approach to dam notching, culminating in dam removal. Sluice gates would be installed and operated prior to each increment of dam notching. Controlled sediment releases to the Carmel River below the Dam would occur over a 60 to 100 year period. When complete, this alternative would theoretically provide unimpeded fish passage, release bedload (including spawning gravel) from the upper watershed, and restore the river and canyon to its pre-dam conditions. However, this alternative would have substantial long-term impacts to water quality and fish for 60 to 100 or more years. Additionally, the ability to "control" releases was not demonstrated, and potential flooding impacts were also considered in eliminating this alternative.

DEMOLITION AND MINING

This alternative would remove the Dam immediately through demolition to its base at elevation 457 feet. An attempt would be made to mine the released sediment. It was considered doubtful that mining could keep pace with downstream transport of sediment. The sediment releases associated with this alternative could jeopardize the listed steelhead trout population in the river as well as CRLF; result in substantial channel aggradation and bank migration and significantly increase flood risk; and risk loss of property, public infrastructure, and human life. Therefore, this alternative was eliminated.

MITIGATED RETROFIT AND DREDGE TO RESTORE CAPACITY

This alternative considered dredging the reservoir to restore its water storage capacity while retrofitting the Dam for seismic and flood-safety. This alternative was considered and eliminated due to significant, unavoidable water quality, steelhead trout, and CRLF impacts associated with dredging, as well as traffic, noise and air quality impacts associated with sediment disposal.

Water Diversion Alternatives

Installation of Water Wells in the Russell Field Area

This alternative considered three 2,400-gpm wells installed to a depth of approximately 80 feet in the alluvial deposits in the Russell Field area. The wells would be equipped with vertical turbine pumps delivering water to CAW's filter plant with an elevation head equivalent to that provided by the reservoir (total lift of approximately 200 feet to El 525). The wells would discharge to a common 24-inch-diameter, 2,000-foot-long, steel pipeline that would connect to the existing treatment facilities in the vicinity of the CVFP. Well installation would include the stainless-steel screen and casing, a properly installed filter pack, concrete slab at the well head, manifold piping, and valving. The pumps would have 100-hp electrical motors energized from a nearby 12-kV power line. Motor starters, switchgear, instrumentation and controls would be included in the outdoor-type installation. This alternative was eliminated due to cost and operational considerations.

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3.2 PROPOSED PROJECT: DAM THICKENING

3.2.1 OVERVIEW

The Proponent's Proposed Project (or in NEPA terms, the proposed action) is to retrofit the existing SCD, which is owned and operated by the Coastal Division of the CAW. The proposed improvements are intended to comply with DWR, Division of Safety of Dams (DSOD) requirements to address safety deficiencies and guard against failure from an MCE, and a PMF event, which could erode dam abutments.

Engineering investigations have identified structural improvements described as "downstream dam thickening" as the most appropriate design option for strengthening the Dam. This approach was the preferred project alternative in a 1995 report prepared for CAW by WCC, entitled *Structural Improvement of San Clemente Dam, Preliminary Feasibility Study*. MWH reviewed and approved this approach in 2004 for this EIR/EIS. DSOD confirmed that the Dam thickening alternative is an acceptable design (July 1, 1998, letter) and approved the contract drawings and specifications for the retrofit in 2001.

3.2.2 PROJECT LOCATION

For the purposes of this Final EIR/EIS, the Proponent's Proposed Project study area and area of potential effect comprises the reservoir, dam, CVFP, access roads, and affected reaches of the Carmel River and San Clemente Creek. Figures 3.2-1 and 3.2-2 depict the project region and vicinity, respectively.

The Project Area is within the upper reaches of the Carmel River in an unincorporated area of Monterey County. SCD sits at the confluence of Carmel River and San Clemente Creek (River Mile [RM] 18.5), approximately 15 miles southeast of the City of Carmel-by-the-Sea and 3.7 miles southeast of the Carmel Valley Village. Approximately five miles upstream of the SCD, is Los Padres Dam (LPD) at RM 23.5 on the Carmel River. SCD impounds a reservoir and serves as a surface water diversion point from the Carmel River.

The Project Site and most of the land surrounding the reservoir are owned by CAW. Land adjacent to the reservoir is largely undeveloped, consisting of steep slopes covered with dense chaparral and oak woodland. The CVFP is 1.5 miles north of the Dam. Surface water from the reservoir is gravity-fed to the CVFP. The Sleepy Hollow subdivision is located on San Clemente Drive adjacent to Carmel Valley Road and consists of 23 estate-sized lots with 16 completed residences. The Sleepy Hollow Steelhead Rearing Facility (SHSRF), constructed and operated by the MPWMD on land owned by CAW, is located less than one mile downstream of the existing dam.

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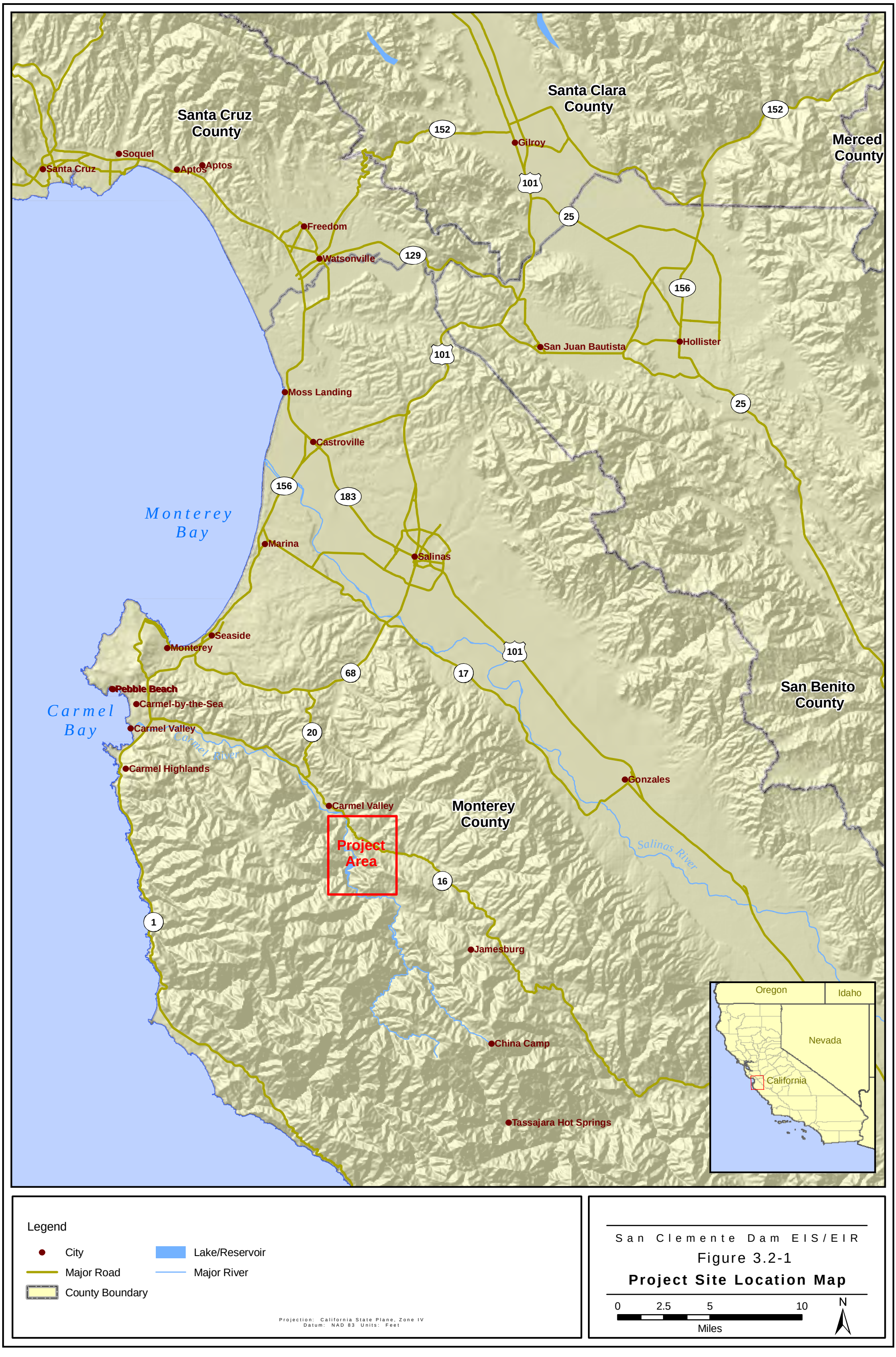

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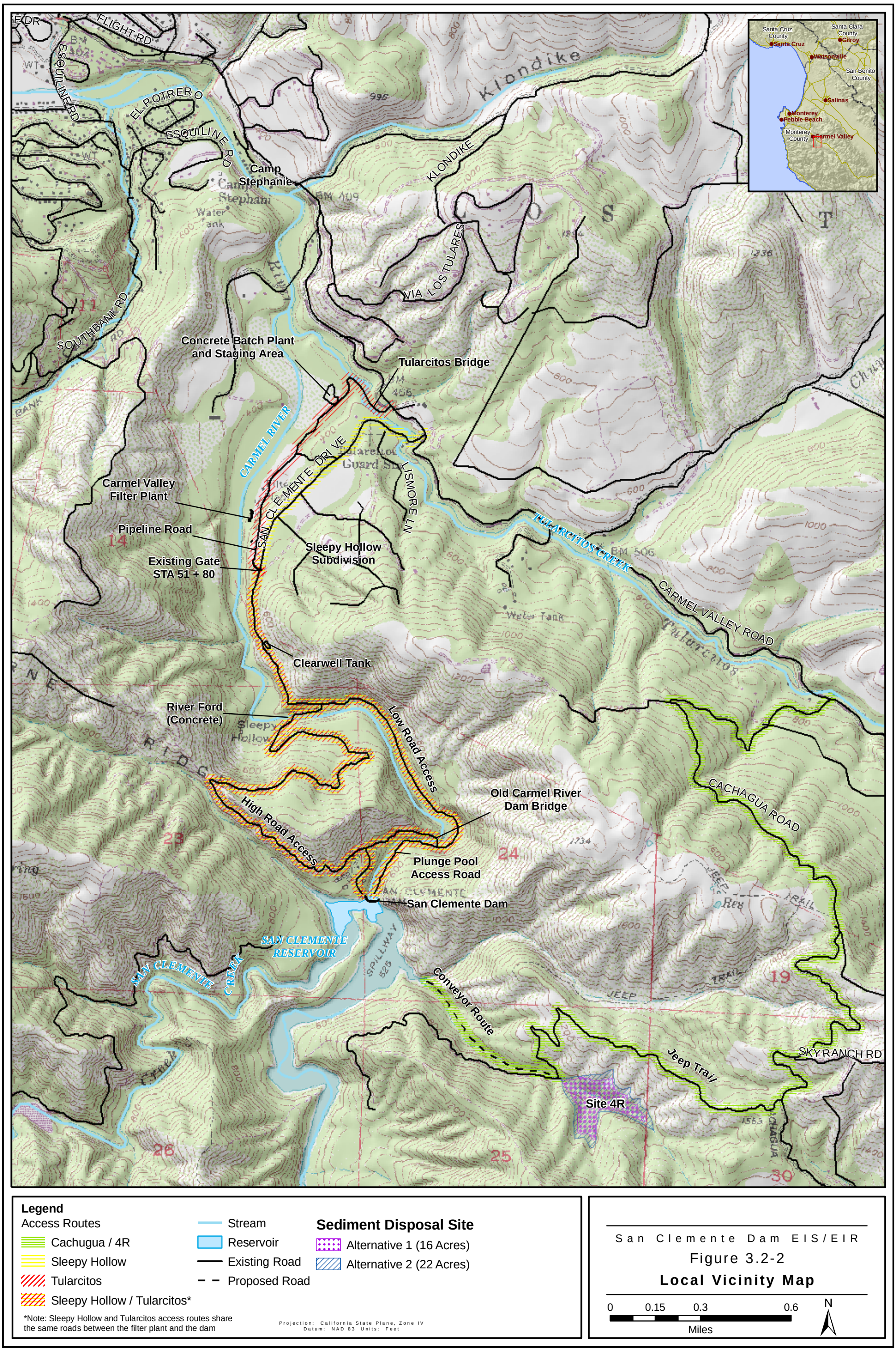

Legend

Access Routes
- Cachugua / 4R
- Sleepy Hollow
- Tularcitos
- Sleepy Hollow / Tularcitos*

- Stream
- Reservoir
- Existing Road
- Proposed Road

Sediment Disposal Site
- Alternative 1 (16 Acres)
- Alternative 2 (22 Acres)

*Note: Sleepy Hollow and Tularcitos access routes share the same roads between the filter plant and the dam

Projection: California State Plane, Zone IV
Datum: NAD 83 Units: Feet

San Clemente Dam EIS/EIR

Figure 3.2-2

Local Vicinity Map

0 0.15 0.3 0.6 Miles

N

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3.2.3 EXISTING STRUCTURE & OPERATIONS

San Clemente Dam

SCD is a concrete arch dam constructed in 1921, with a maximum structural height of 106 feet and a crest length of 300 feet. The reservoir impounded by SCD is currently used in conjunction with the Los Padres Reservoir and Upper Carmel Valley Aquifer wells as a source of water diversions to the CVFP. The reservoir and the CVFP are also an important water source for unincorporated Carmel Valley Village during the winter, although diversions are limited during low flow seasons. Currently, the reservoir serves as a point of diversion to serve the Peninsula and is operated to facilitate fish passage. A major portion of the Monterey distribution system relies upon the pressure head supplied by diversion from the reservoir, and many of the appurtenant system components (e.g., pumps, feed systems, etc.) were designed and installed accordingly.

Currently, CAW is limited to direct diversion of 1,137 AF at SCD based on the amount of water actually put to use by its predecessors prior to 1914. This is equivalent to a continuous direct diversion rate of 3.185 cubic feet per second (cfs) over a typical 180-day, six-month long dry season.

Pursuant to the 2001 Conservation Agreement between CAW and the National Marine Fisheries Service (NMFS), during low flow periods (defined as times when stream flow in the Carmel River at the Don Juan Bridge [RM 10.8] gage is less than 20 cfs for five consecutive days), CAW is required to cease surface diversions from SCD and to limit its production from wells in the Upper Carmel Valley Aquifer to maintenance levels, with no more than a combined instantaneous diversion of 0.5 cfs from the Russell wells. At these times, CAW maximizes production from its wells in the Lower Carmel Valley Aquifer and Seaside facilities. These requirements were added to State Water Resources Control Board (SWRCB) Order 95-10 in 2002 and are also referenced in the Annual Memorandum of Agreement (MOA) on Carmel River flows described under “Dam Construction Reservoir Drawdown and Stream Diversion” in this chapter. Refer to Section 1.5 of this Final EIR/EIS for a discussion of federal, state, and local regulatory requirements, including those of NMFS and the SWRCB.

The SCD crest is at Elevation 537 feet. (Figure 3.2-3 and 3.2-4) show the plan and profile of the existing dam. The spillway is an overpour structure with a crest elevation of 525 feet located at the center of the Dam. The original design storage capacity of the reservoir was 1,425 acre-feet at the spillway crest and 2,260 acre-feet at the top of the gates with the spillway gates in place. However, siltation has reduced the storage capacity of the reservoir to less than 150 acre-feet at the spillway crest, based on results of a survey conducted in March 2002 by CAW.

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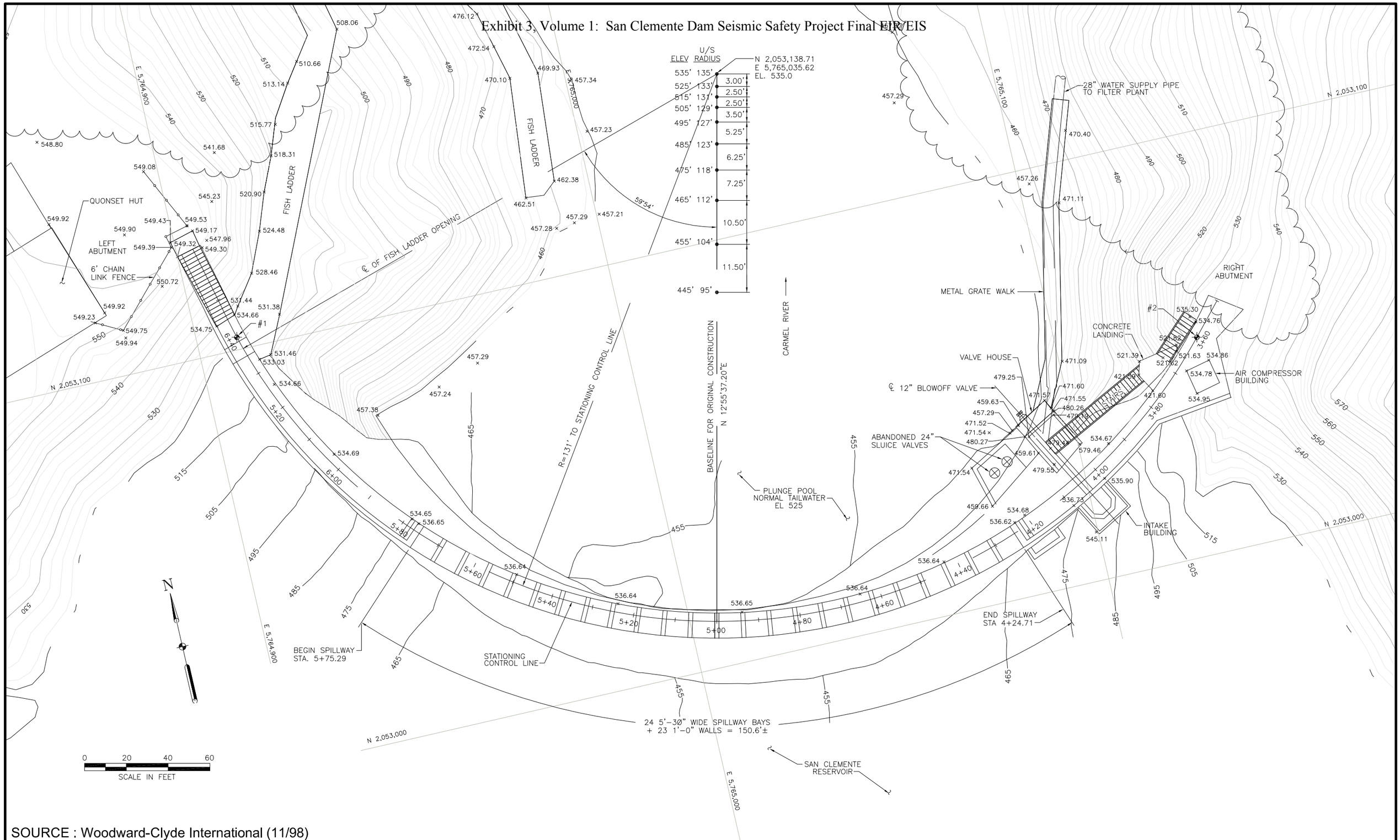

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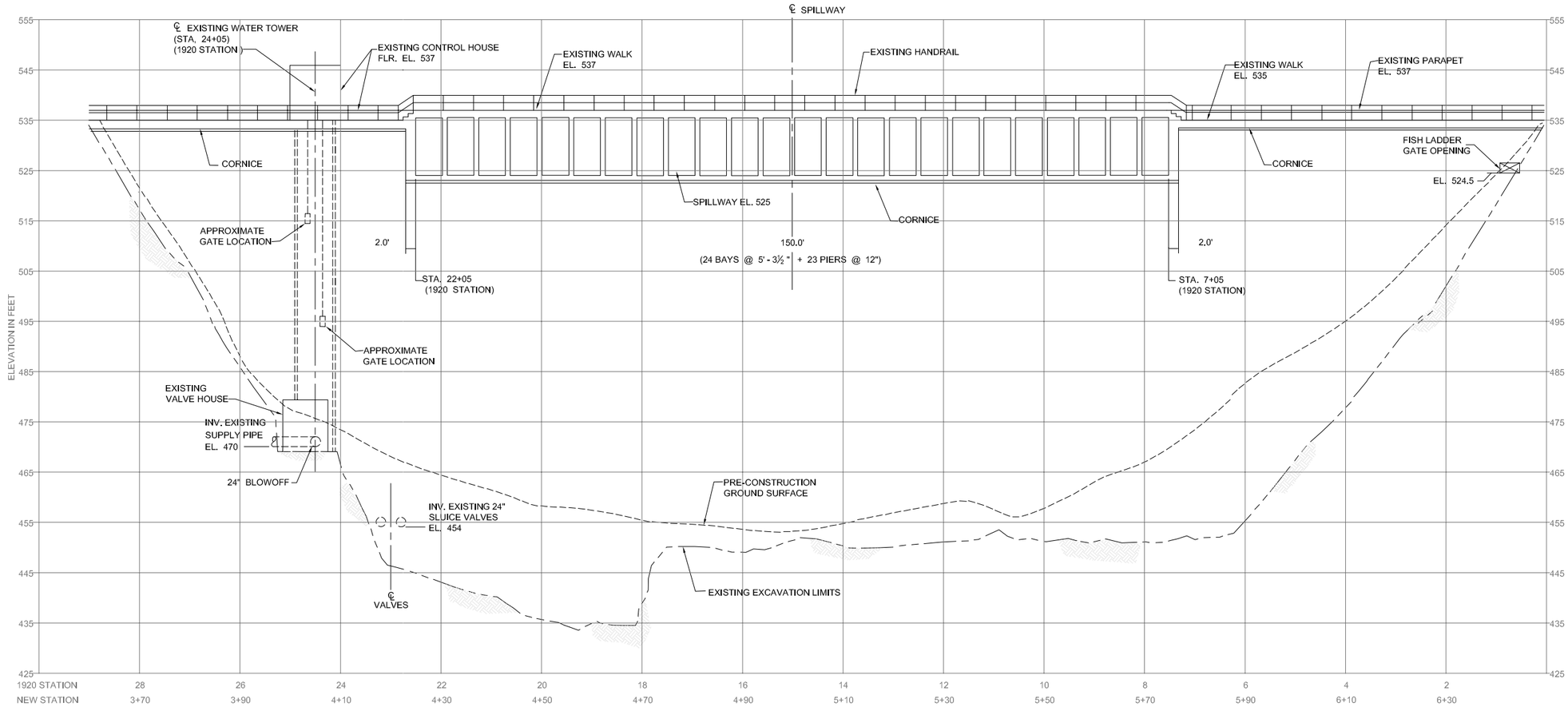
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF EXISTING DAM

FIGURE #



PROFILE ALONG VERTICAL PROJECTION
OF DOWNSTREAM ARC OF EL. 535
(LOOKING UPSTREAM)

NOTES:

1. ALL INFORMATION WAS GENERATED FROM ORIGINAL DRAWINGS DATED AUGUST 31, 1920.

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SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PROFILE OF EXISTING DAM

FIGURE #

All spills since 1996 have occurred when the reservoir water level exceeds Elevation 525 feet. Operational restrictions are established annually via an MOA signed by California Department of Fish & Game (CDFG), MPWMD, and CAW (see Section 1.4).

Prior to 1996, the reservoir was operated without the spillway flashboards during the winter peak flood season (generally November 1 to April 30) and with flashboards in place during the spring, summer and into fall. The MPWMD was concerned that the shallow water levels occurring in the reservoir with the flashboards installed were responsible for elevating water temperatures in the Carmel River downstream of SCD and at the SHSRF. MPWMD requested that CAW control the reservoir without the spillway flashboards (MPWMD letter to CAW, April 22, 1997); flashboards have not been used at the Dam since 1996.

The outlet structure consists of a concrete outlet tower attached to the back end of the Dam with three intake gates at elevations of 515, 495, and 470 feet. The lower two gates cannot be operated due to buildup of sediment; water can be taken out from the highest gate. The upper gate has been fitted with a standpipe with an intake elevation of 522 feet to extend the intake above the current sediment level of about 515 feet surrounding the outlet tower. A valve house is located at the downstream toe of the Dam on the right abutment (looking downstream). The valve house contains a diversion structure that directs water to a conveyance pipe for treatment at the CVFP and to a low-level discharge pipe to the river. The eastern-most spillway bay (on the right side of the spillway looking downstream) is permanently closed to prevent damage to the valve house and appurtenant structures at the toe of the Dam during spilling. Two additional pipes extend through the Dam at approximately Elevation 454 feet, but the intakes to these pipes have been buried by sediment and are not operational.

In 2002, DSOD ordered modifications to SCD to meet interim dam safety requirements (see Section 3.6). These included installing six 12-inch valved ports in the Dam to draw down the reservoir to 515 feet during low flow periods.

Fish Ladder and Fishery Habitat

A fish ladder approximately 68 feet high is located on the west side of the Dam (left abutment), and provides passage for migrating steelhead between the plunge pool at the downstream base of the Dam and additional spawning habitat on Carmel River and San Clemente Creek upstream of the reservoir.

Carmel Valley Filter Plant

The CVFP is a surface water direct filtration and treatment facility operated by CAW, located approximately two miles downstream from the SCD on the east bank of the Carmel River. A 24-inch diameter diversion pipe parallel to the Carmel River delivers water from the reservoir to the CVFP. Access to the CVFP from Carmel Valley Road is via San Clemente Drive. No changes to the CVFP are proposed as part of this project.

3.2.4 PROJECT CHARACTERISTICS

This section describes the SCD Strengthening Project, including abutment protection, spillway and crest modifications, electrical system upgrades or improvements, and replacement of the fish ladder. Sediment accumulated behind the Dam would be left in place. It also summarizes construction activities necessary to complete the project and describes improvements to and/or new roads proposed as part of the project.

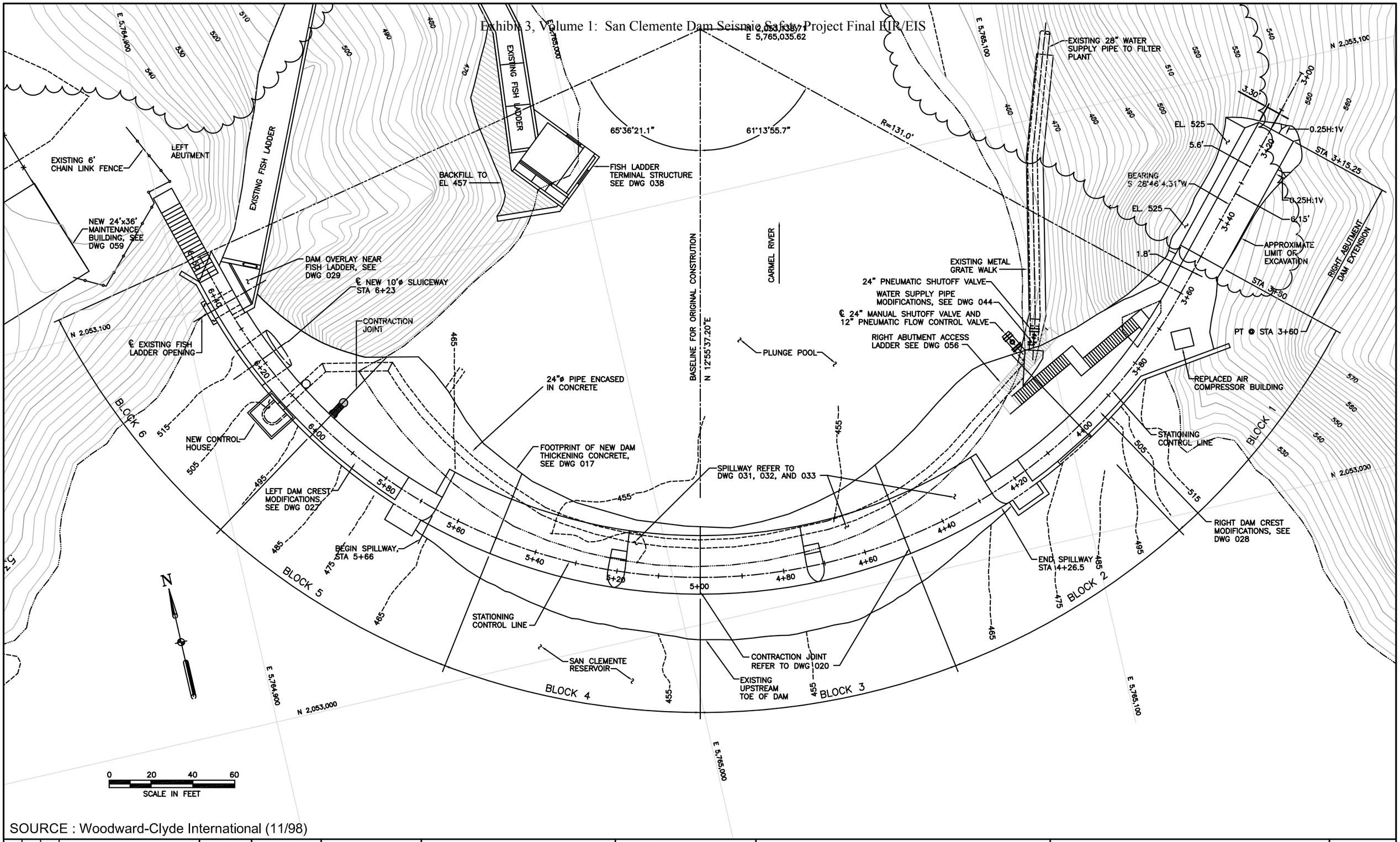
Dam Thickening

The proposed seismic retrofit project consists of thickening the Dam on the downstream side and providing abutment protection, particularly on the right abutment (as seen facing downstream). Figures 3.2-5 and 3.2-6 provide an overview of the Dam thickening plan and profile for the Proponent's Proposed Project. The Dam would be thickened by the placement of 50 to 60 cast-in-place concrete blocks, each approximately 50 feet in length and 10 feet in height, on the downstream face of the Dam. Each block would be tied to the existing dam structure with reinforced steel dowels. The thickness of the new concrete would be approximately proportional to the original thickness at each location along the Dam profile. For example, above Elevation 465 feet, the Dam would be thickened by 80 percent, ranging from 4.2 to 8.8 feet of concrete added; below Elevation 465 feet, 9 feet of concrete would be added. Figure 3.2-7 illustrates typical sections of the thickened dam.

Staging, Concrete Mix, and Production Plant

The project requires a concrete batch plant for concrete. The batch plant requires a level area approximately 5 acres (about 218,000 square feet) in size with good road access in order to move in/out the larger pieces of batch pant equipment and aggregate materials. The presence of mountainous terrain up the canyon area closer to the Dam, and narrow, winding access roads limits possible site locations for the batch plant to near Carmel Valley Road. A smaller site closer to the Dam, was considered, but it was determined to not be large enough to allow large trucks to turn around. Therefore, it is not feasible to locate the batch plant closer to the Dam. Additionally, the proximity of electric power lines avoids the need to use of diesel generators for batch plant operation. This avoids additional emissions of NO_X, CO, ROC, SO_2, and diesel fine particulate (PM_{10}).

A portable concrete batch plant is proposed as shown in Figure 3.2-8. The proposed location for the concrete batch plant is an approximately 5-acre site, located about 2,400 feet northeast of the existing CVFP. This level area of CAW property has been disturbed in the past and sufficient lay-down area is available at this location. In addition, eighteen-yard transfer trucks could off-load raw materials directly onto stockpiles for use in concrete production.



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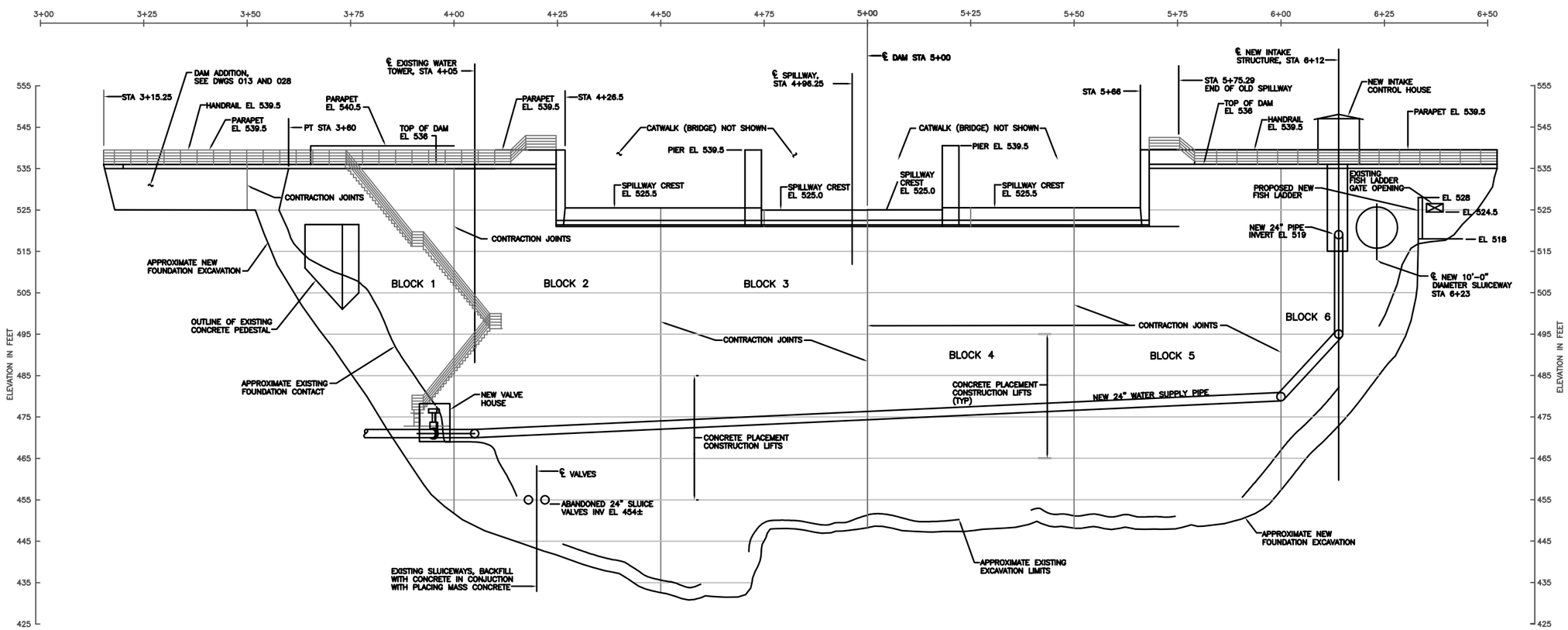
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF THICKENED DAM

FIGURE #



DEVELOPED PROFILE ALONG THE DOWNSTREAM FACE OF NEW CONCRETE
(LOOKING UPSTREAM)

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NOTES:

1. CONTRACTION JOINTS SHALL HAVE 1-INCH CHAMFERS ON THE DOWNSTREAM FACE.
2. IF THE MAXIMUM HEIGHT OF A CONSTRUCTION LIFT PLACED AGAINST THE FOUNDATION IS LESS THAN 2-FEET, OR IF THE VOLUME OF CONCRETE IN THE LIFT IS LESS THAN 5-YARDS, INCLUDE THAT LIFT PLACEMENT WITH THE NEXT VERTICAL LIFT.

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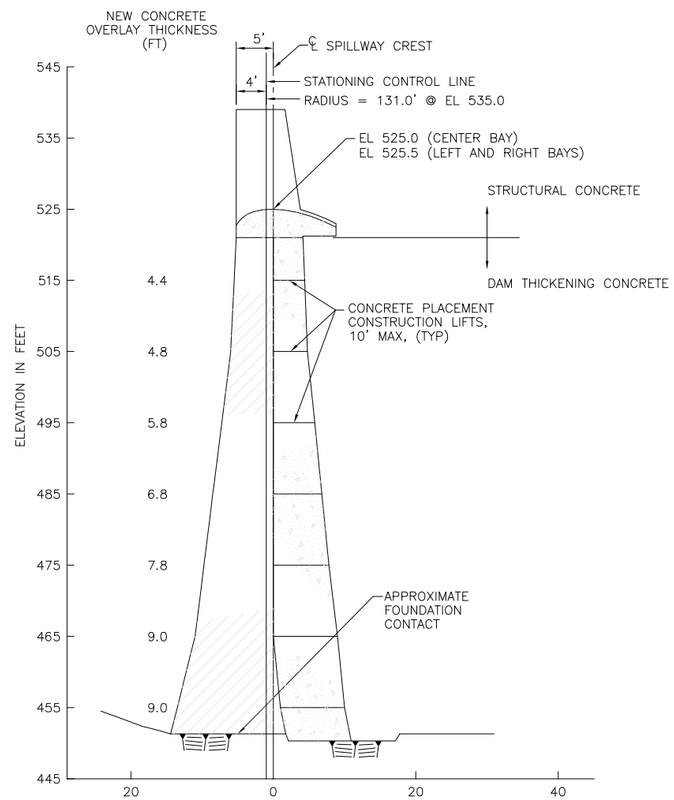
SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILE OF THICKENED DAM

FIGURE #



TYPICAL SPILLWAY SECTION
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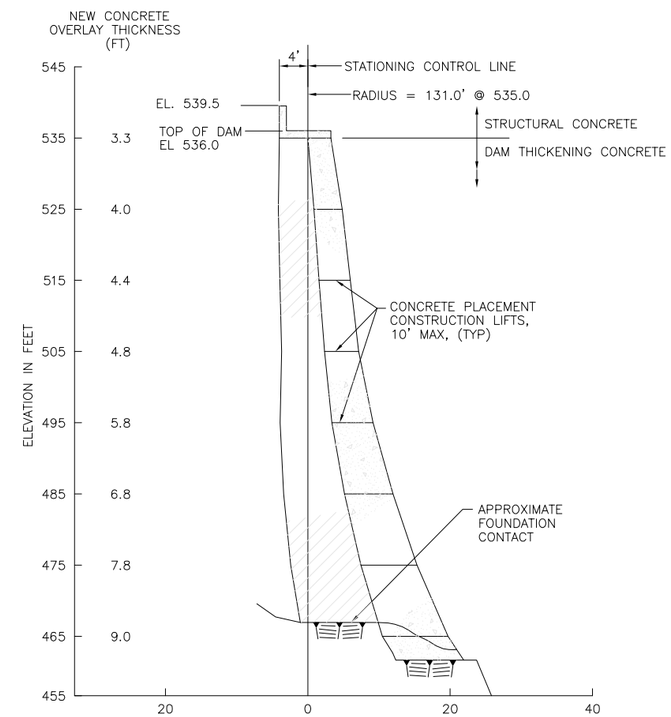

TYPICAL NON-SPILLWAY SECTION
STA 6+00

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NOTES:

1. REFER TO TABLE ON DWG 014 FOR OVERALL DAM GEOMETRY. LAY OUT NEW CONCRETE OVERLAY BASED ON THICKNESS CALLED OUT ON TYPICAL SECTIONS. IN THE EVENT THE ACTUAL RADII OF THE DOWNSTREAM FACE OF THE OVERLAY VARIES FROM THE SPECIFIED RADII ON DWG 014 BY MORE THAN SIX INCHES, NOTIFY ENGINEER BEFORE CONCRETE PLACEMENT.
2. FORM CONCRETE LIFTS WITH VERTICAL CHORDS NO GREATER THAN LIFT HEIGHT.
3. FORM CONCRETE LIFTS WITH HORIZONTAL CHORDS NO GREATER THAN 10 FEET.
4. CONSTRUCTION LIFT HEIGHTS SHOWN ARE MAXIMUM. CONTRACTOR MAY SUBMIT ALTERNATIVE LIFT HEIGHT FOR APPROVAL BY ENGINEER.

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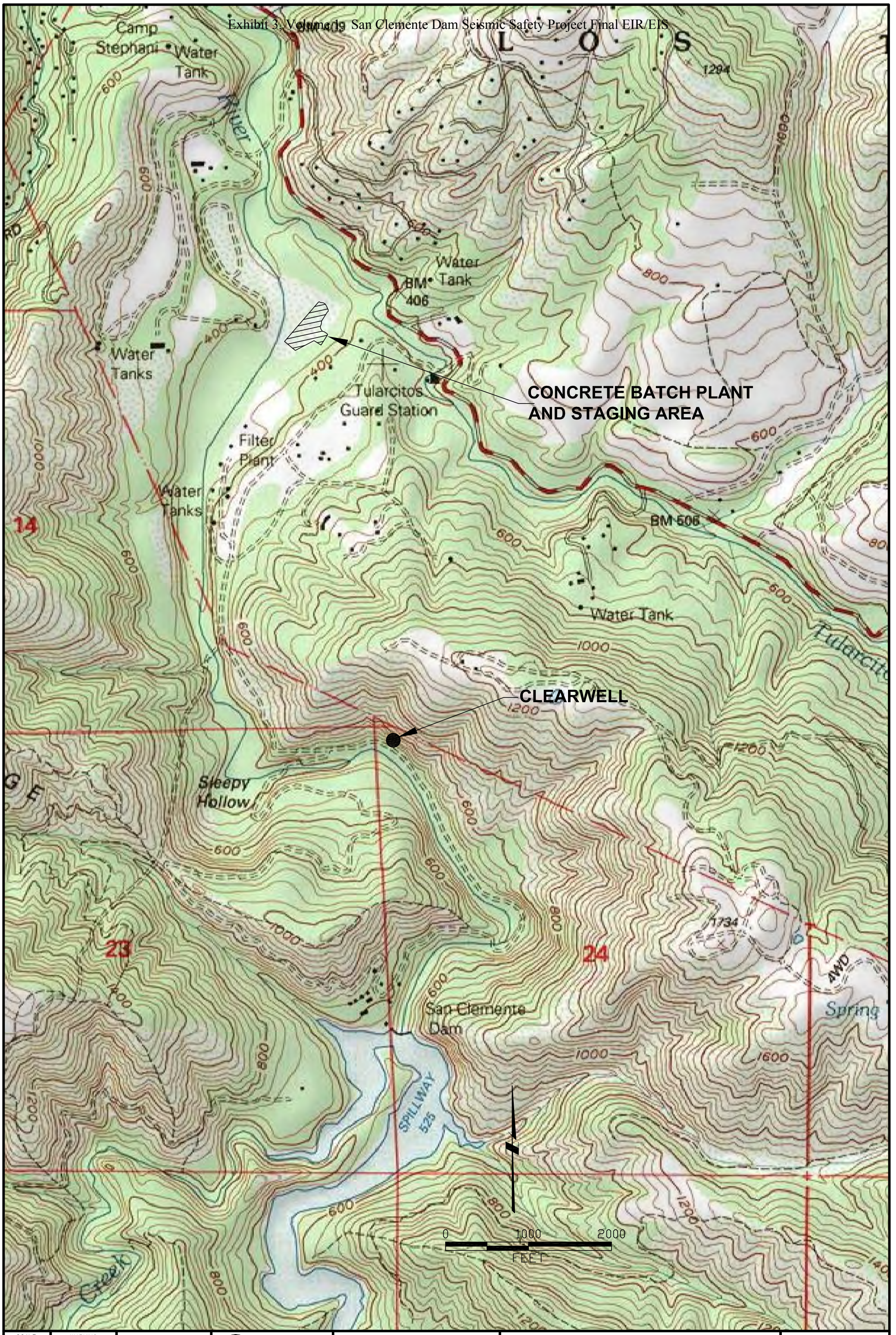
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
TYPICAL SECTIONS OF THICKENED DAM

FIGURE #



SCALE	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE	DESIGNED / DRAWN / CHECKED	MWH Walnut Creek California		CALIFORNIA AMERICAN WATER SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT CONCRETE BATCH PLANT LOCATION	FIGURE #

An additional proposed location for staging is an approximately 0.65 acre (28,000 square feet) site, located about 2,600 feet south of the CVFP along the unpaved access road that leads from San Clemente Drive to the Dam. The site was used as a construction and soil processing staging site for a facilities improvement project called the CVFP Clearwell (Water Tank) Project. If additional construction staging is necessary, this site may provide area for construction equipment and material storage. However, the Clearwell staging area is not large enough to accommodate the concrete batch plant needed for the project.

Based upon construction materials studies, the preferred source of aggregate is imported aggregate, since the quality of onsite aggregate is highly variable. By using an off-site source of aggregate, processing time can be eliminated and development and maintenance of a construction schedule is more predictable.

Off-site aggregate will be delivered and stockpiled near the concrete batch plant over an extended period of time in advance of the retrofit. Materials hauled to the batch plant for the retrofit include about 10,000 tons of coarse aggregate, 5,000 tons of sand, 24,000 sacks of cement, and 8,000 sacks of fly ash. This material will be used at the batch plant to produce approximately 5,800 cubic yards of concrete for the Dam and 1,400 cubic yards for the fish ladder. The concrete would be hauled to the Dam in concrete mixer trucks.

Dam Construction Reservoir Drawdown and Stream Diversion

The reservoir would be partially drained prior to concrete placement to reduce the hydrostatic force against the Dam while under construction. This would also provide some storage capacity as a contingency in case of unexpected storms. The water surface elevation would be lowered to approximately Elevation 510 feet. In addition, stream flows would be passed downstream to maintain the flow and habitat in the Carmel River during construction. Figure 3.2-9 provides and overview of drawdown characteristics for the proposed dam thickening.

The need to draw down the reservoir during construction constrains the main construction activities to a period when streamflow is low enough to be passed through a bypass pipeline and around the construction dam site. The target streamflow for construction is about 50 cfs.

The following steps would be taken to draw down the reservoir while maintaining the stream flow:

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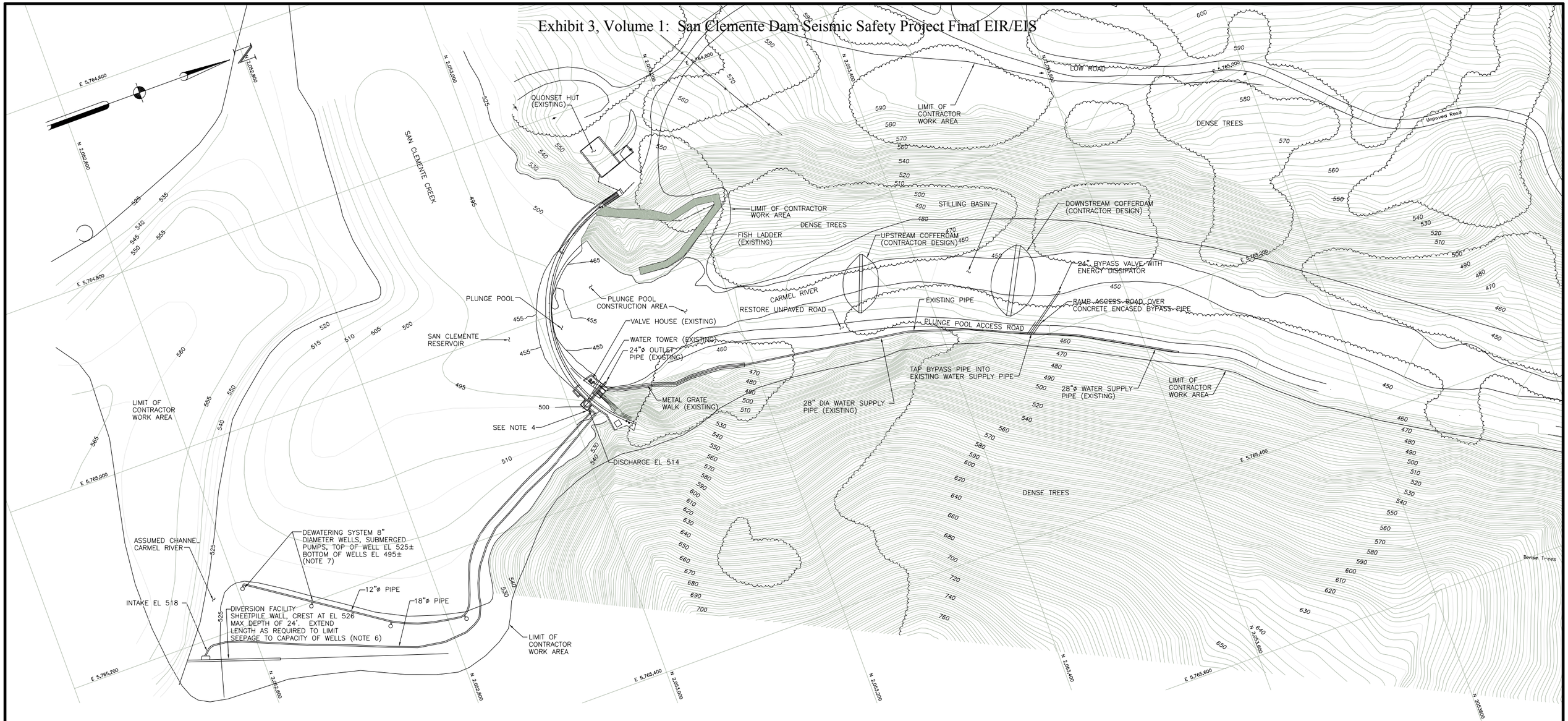

PLAN

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1. LOCATION AND DEPTH OF CARMEL RIVER AND SAN CLEMENTE CREEK CHANNELS INTO THE DRAWN DOWN SAN CLEMENTE RESERVOIR ARE APPROXIMATE. CONFIRM PRIOR TO STARTING
2. LOCATION OF SEDIMENT CONTOURS WITHIN SAN CLEMENTE RESERVOIR ARE APPROXIMATE BASED ON CAL AM SURVEY IN SUMMER 1998. CONFIRM PRIOR TO STARTING WORK.
3. FINALIZE WITH ENGINEER LOCATION OF DEWATERING SYSTEM AND DIVERSION CUTOFF AS RESERVOIR IS INITIALLY DRAWN DOWN.
4. PROVIDE CONNECTION OF 12"ø PIPE (DEWATERING SYSTEM) AND 18"ø PIPE (DIVERSION FACILITY) TO FIT INTO 18" x 24" INTAKE VALVE AT EL 514 FT.
5. SIZE AND LOCATE THE COFFERDAMS AND STILLING BASIN FACILITY DOWNSTREAM OF THE PLUNGE POOL CONSTRUCTION AREA TO MEET CONSTRUCTION RELATED REQUIREMENTS.
6. SIZE AND LOCATION OF DIVERSION FACILITY IS DIFFERENT FOR DAM REMOVAL, NOTCHING, AND RIVER REROUTE WITH DAM REMOVAL ALTERNATIVES
7. DEWATERING SYSTEM NOT ANTICIPATED FOR DAM REMOVAL NOTCHING, RIVER REROUTE WITH DAM REMOVAL ALTERNATIVES

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SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF DRAWDOWN AND DIVERSION

FIGURE #

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- Draw down the reservoir using the existing intake structure with gates at Elevations 515 feet and 495 feet. The high and mid level intake gates at Elevations 515 and 494 feet will need to be exposed from deposited sediments to draw down water below Elevation 515 feet. A sheetpile barrier would be installed around the intake. The sediment between the sheetpile barrier and the Dam intake would be removed and dewatered in a temporary basin. After the turbidity has cleared the reservoir would be lowered to Elevation 510 feet.

- At some point the turbidity of the water in the reservoir may be too high to release it directly downstream. A diversion facility, consisting of a sheetpile cutoff wall, would be installed in the channel upstream to divert incoming flows from the Carmel River through a 36-inch-diameter bypass pipeline. This pipeline would convey the river flow to the existing mid-level intake (which may be sealed to keep out turbid water) and continue through the existing 30-inch-diameter pipeline approximately 500 feet downstream of the Dam to an energy dissipation structure where the water would be released to the Carmel River bed. During the construction season most of this bypass flow is anticipated to be released from Los Padres Reservoir upstream. A similar, smaller sheetpile diversion facility and pipeline may be required to divert flows from San Clemente Creek around the Dam.

- Well points would be installed within the sediment deposits downstream of the diversion facility, as necessary to capture leakage water to maintain the water surface in the reservoir at the desired level. Pumps would be equipped with filters so that water coming out of the wells would be sufficiently clear to pass downstream.

Exact locations of the diversion facility and well points would depend on the actual sediment level when construction begins, and will be determined in the field at the time.

Site Activities at Plunge Pool

The process of thickening SCD requires dewatering the plunge pool at the downstream toe of the Dam, drying the downstream dam face, and installing two cofferdams downstream of the plunge pool to keep the site dry and to provide a settling basin.

The plunge pool downstream of the Dam would be completely drained prior to construction to prepare the foundation for the new concrete and to allow access for construction workers and machinery for placement of concrete. To keep the plunge pool staging area dry during construction, two cofferdams would be installed. One cofferdam is required to prevent backflow from the Carmel River. The second one would be located upstream to create a settling basin between the cofferdams. This basin would hold any leakage from the downstream cofferdam, and be used to allow settling or filtration of turbid water before it is released downstream.

The lower portion of the thickened dam would not be exposed to the plunge pool waters while the concrete cures. The temporary downstream cofferdam would not be removed until it has cured for at least 28 days, which is the standard concrete curing time. Due to the elevation above the plunge pool, the upper portions of the thickened dam would not

have any potential to be in direct contact with water during the curing process. After construction is completed and the cofferdams are removed, the cofferdams and the solids accumulated in the settling basin would be removed and used locally. Larger materials would be placed on-site for erosion protection and fines would be disposed of in the reservoir area.

The foundation surface and the downstream face of the Dam would be prepared prior to placing the new concrete overlay. Foundation preparation includes removal of alluvial deposits, loose rock blocks, overhanging rock, and weathered and highly jointed rock down to sound rock. Material would be taken to a local disposal site or used onsite as described above. Care would be taken not to undermine the existing dam. Other preparation includes cleaning the foundation surface with high-pressure water jets; excessive excavation of shear zones and dikes; dental excavation of loose infill materials and washing these zones; filling of joints with slush grout; and filling of voids and depressions with dental concrete.

Dam downstream face preparation would include: sandblasting or water blasting of the downstream surface to clean the surface; drilling holes and installing steel dowels; and pre-wetting the surface for the 24 hours prior to concrete placement to maximize the bond between the new concrete blocks and the existing concrete.

A large tower crane with a concrete bucket would be used to place the concrete. The crane would be located downstream of the Dam in the drained plunge pool to provide adequate access to the entire footprint of the Dam, from the crest down to the foundation. Bucket placement has been assumed instead of pumping. Pumping is not suitable for this application because it would require a higher slump and smaller aggregate. This would result in more shrinkage and would therefore be detrimental in bonding the new concrete to the old, which is a concern of DSOD.

New outlet valves would be installed and tested after concrete placement. In the final task before demobilization, the construction joints between the concrete blocks would be grouted through a system of embedded grout pipes after the concrete has cured. In a dry year this could occur as late as January, otherwise it would take place after uncontrolled winter spills have stopped.

Abutment Protection

The rock at the right abutment appears to be insufficient to support the loads imposed by the thickened structure. To provide sufficient support for the thickened dam, the right abutment may require extending a new concrete wall approximately up to 50 feet into the abutment to tie into more competent rock. Scaling would be required to remove weathered and fractured rock, and rock bolting may be necessary to secure some potentially unstable rock blocks. In addition, much of the right abutment would be covered with reinforced concrete or shotcrete to protect it from the erosive forces applied by overtopping flows.

The left abutment is likely acceptable except for localized areas that would require dental excavation or strengthening of intensely fractured rock and filling of voids. Rock bolting would be performed to secure potentially unstable rock bolts. Portions of both abutments that exhibit weathering or a significant degree of cracking would be covered with shotcrete as appropriate to protect the surface from scour during overtopping.

Final design would include detailed geologic mapping and a drilling program into rock on both the left and right abutments to further define rock quality, joint orientation and stability, enabling further refinement of the preliminary design assumptions, excavation plan, and construction quantities.

Spillway and Crest Modifications

The spillway and dam crest would be modified to increase the effective spillway width and reduce the amount of overtopping during the PMF. The spillway superstructure (shown in Figure 3.2-4) on the top of the Dam would be removed. The normal maximum controlled water surface will be limited to Elevation 525 feet with no flashboards or gates. The hydraulic capacity of the spillway would be increased by reducing the number of piers from 23 to 2, thereby increasing the effective spillway width. In addition, the increased spacing between piers would reduce the buildup of downed trees and other debris at the existing closely spaced piers. A catwalk bridge would be constructed across the three spillway bays.

The Dam crest would be raised from Elevation 537 feet to Elevation 539.5 feet by constructing a parapet wall along the upstream edge of the crest. This has no effect on current or future water storage. These measures would increase the spillway capacity at the parapet elevation from about 20,000 cfs to about 27,000 cfs. This compares to a 100-year flood flow of about 25,000 cfs. Overtopping of the parapet wall during a PMF would be reduced from 14 feet to 10 feet. The spillway design would be modified to increase the cantilever (overhang) from one foot to 4 feet, maintain the center bay set at Elevation 525.0 feet and raise the crest of the side bays to Elevation 525.5 feet. These modifications to the spillway design have been incorporated into the project to minimize the potential for out-migrating fish to strike the Dam face.

Modification of Low-Level Outlet Works

The existing low-level outlet works include an upstream gate house over a stilling well. Three manually operated sluice gates control inflow into the well. A 24-inch-diameter pipe passes through the Dam and connects the existing well to a 24-inch-diameter steel wye branch just downstream of the Dam. One leg of the wye has a 24-inch gate manual shutoff valve and a 12-inch manual flow control valve and discharges to the river. The other is controlled with a 24-inch manual gate valve and discharges to the 30-inch-diameter pipeline to the CVFP. The wye and valves are in a small valve house at the toe of the Dam that is within the footprint of the proposed concrete buttress.

Due to the sedimentation buildup on the upstream face of the Dam in this area, the existing control structure will be abandoned-in-place and a new structure and outlet pipe will be constructed on the left upstream face of the Dam, in the vicinity of the new 10-ft. diameter sluice pipe at Station (Sta) 6+23. The three manually operated sluice gates controlling inflow into the existing well will be abandoned-in-place and removed from service. The existing 24-inch diameter pipe penetrating the Dam will be abandoned-in-place and infilled with concrete. A single manually operated sluice gate will be installed at the new outlet works location at approximately Sta 6+12 and invert Elevation 519. Trashrack protection of the upstream intake will be provided. The existing wye branch, valves and building downstream of the Dam will be removed. The new 24-inch pipe penetrating the left side of the Dam would be routed down the left downstream face of the existing dam, and across the Dam to the right downstream face, where a new wye branch and 24-inch butterfly valves will be provided connecting to the CAW water system. The leg to the river will include a 24-inch manual shutoff valve and a pneumatically operated 12-inch flow control valve. The leg to the CVFP pipeline will have a 24-inch pneumatically operated shutoff valve. Control of flow will be from the filter plant.

The new 24-inch pipe located on the downstream face of the existing dam will be encased in the new cast-in-place concrete blocks, in order to protect it from discharges over the spillway. The pipe has been routed near the base of the Dam in order to maximize the concrete encasement of the pipe. At the elevations shown, the additional concrete thickness is at least 6 feet, compared to the 2 feet diameter of the pipe. The dowels connecting the new concrete to the Dam are 14 inches long, leaving almost 5 feet of concrete for unobstructed placement of the pipe.

The invert of the new 24-inch pipe on the upstream face of the Dam has been placed as low as reasonably possible (and therefore close to the 10-foot diameter sluice pipe) to maximize water depth, while minimizing blockage from debris near the surface, or passage of sediment from below.

One possible alternative to placement of the pipe within the new downstream concrete face would be to run the pipe across the new downstream face of the Dam, horizontally underneath the new 4-foot wide lip of the spillway. This would eliminate the direct flow of water onto the pipe during spilling by raising it to a protected area. However, service and maintenance of the pipe in this location near the top of the Dam would be difficult.

High-Level Outlets

A high-level outlet equipped with a 10-foot diameter sluice gate would be installed during the proposed dam thickening as shown in Figure 3.2-5. This will enable controlled and limited sediment releases to maintain both upstream passage to the fish ladder exit and access to the upper gates of the existing low-level outlet works. The discharge of sediment would be regulated by the United States Army Corps of Engineers (USACE) as described in Chapter 1. It is anticipated that the high-level

outlets would be operated during the rising limb of early to mid-season storms to release small amounts of sediment while maintaining flow in the fish ladder.

The outlet would be positioned near the fish ladder exit with the invert below the level of the spillway crest (Figures 3.2-5 and 3.2-6). The exact location and elevation of the outlet would be determined in conjunction with the final design of the fish ladder. The gate could be opened during high flows (in excess of ladder flow capacity) to keep the river flowing through the approach channel to the ladder exit as much as practicable. The objective would be to keep the river channel through the reservoir sediments directed at the vicinity of the ladder exit. Therefore, the sluice gate would be located as close as possible to the ladder exit consistent with downstream plunge pool conditions, abutment protection requirements, and fish fall-back considerations.

The outlet would be formed in the new concrete section of the Dam. In the existing concrete section, it would be constructed by drilling an oversized conduit through the existing concrete, placing an inner steel liner in the conduit, and grouting the annulus between the steel liner and the excavated conduit. The lined outlet would discharge to the downstream face of the thickened dam. This gate would be installed against the upstream face of the existing dam. A trashrack would be installed upstream of the gate to protect it from logs and large debris. Minor sediment excavation would be needed to allow installation of the gate and trashrack. This may be accomplished by installing a small sheetpile barrier around the proposed gate inlet. The sediment between the sheetpile barrier and the gate inlet would be removed.

Electrical System

The existing electrical service is supplied by a Pacific Gas & Electric (PG&E) 12-kilovolt (kV) 3-phase pole line located immediately outside an onsite structure above the left abutment of the Dam. Pole mounted transformers provide 3-phase service, which in turn provides service to the Dam itself and a nearby CAW owned residence. Construction power requirements are dependent upon the type and location of any cranes, and dewatering requirements. The need for 480-volt 3-phase 150-kilovolt-ampere (kVA) service has been identified for electrical upgrades for the Dam thickening. This would require changing the transformer but would not require new power poles. A new 50-ampere (amp) service panel would be installed in place of the existing 15-amp service panel. The existing structure would be replaced with a small pre-engineered building that would house the electronic controls for the outlet valves.

3.2.5 PROJECT ACCESS AND IMPROVEMENTS

Access from Carmel Valley Road to San Clemente Dam

Access to the Dam and reservoir is currently provided via San Clemente Drive, a gated road that extends from Carmel Valley Road, through the Sleepy Hollow Subdivision. San Clemente Drive crosses Tularcitos Creek over a single-lane bridge approximately 17 feet wide and leads to CAW gates at the southern bounds of the Sleepy Hollow subdivision. This locked gate prevents public access to the reservoir. San Clemente

Drive is paved from Carmel Valley Road to the locked gate. The road is unpaved from the locked gate to the reservoir. Two other private roads have gated access to the Project Site from private properties to the south and west.

From the turnoff to the filter plant, San Clemente Drive runs approximately 1.7 miles to the base of the Dam. A narrow "pipeline access route" parallels a portion of this route. Access to the left abutment of the Dam is possible by either the "High Road," crossing a ford across the Carmel River, or via the "Low Road," using an existing bridge across the river at the OCRD 1,800 feet downstream from SCD. Improvements will consist of widening and providing turnouts along sections where the terrain permits, and grading and pruning sections of the road. Improvement of the plunge pool access road between the OCRD and the base of SCD would also be necessary to stage the tower crane and other construction equipment at the base of the Dam. The Old Carmel River Dam Bridge (OCRB) would also require upgrading to accommodate heavy loads and large trucks carrying construction equipment. Approaches to the bridge would require modification for long loads and some structural members would be replaced.

Access from Carmel Valley Road to CVFP (Tularcitos Access Route)

The 3-mile access road to SCD from Carmel Valley Road would require realignment and improvements to accommodate heavy equipment used for construction activities. Road realignment includes construction of a new access road (Tularcitos Route) to provide a better line of sight and to bypass the Sleepy Hollow subdivision. The new road would start at Carmel Valley Road about 800 feet west of San Clemente Drive, transverse Tularcitos Creek over a new bridge, and provide access to the proposed staging area and batch plant. The existing road between the staging area and the filter plant would be upgraded and widened.

This road would be developed as a permanent access road to the CVFP and SCD. After completion of the road, the portion of the San Clemente Road that runs through Sleepy Hollow would no longer be used except for emergencies. The location of the proposed turnoff from Carmel Valley Road was selected along a straight section of Carmel Valley Road and provides a sight distance of at least 300 feet in either direction. "Truck Crossing – 500 Feet" signs would likely be necessary on both Carmel Valley Road approaches. An encroachment permit would be required from the County of Monterey. A 100-foot transition on the West Side of the intersection would be constructed. Asphalt pavement for the transition section and 25 feet from the intersection would be installed to protect the Carmel Valley Road edge of pavement and to reduce dust at the intersection.

Approximately 175 feet south of Carmel Valley Road the alignment crosses Tularcitos Creek, where a permanent single-lane bridge will be constructed. This is planned to be a steel truss bridge with a span of approximately 200 feet with a wood deck and concrete abutments. Though this creek normally contains minimal flow, the contributing watershed at this location is approximately 36,000 acres. A 100-year storm would result in a flow of approximately 5,500 cfs. It has been estimated that a bridge with a clear

area of approximately 800 square feet underneath would be necessary to pass flood flows of this magnitude.

The proposed road itself from Carmel Valley Road to the CVFP would consist of a 22-foot wide graded section with a 3-foot-wide drainage ditch. The surface would have 6 inches of Class II base rock installed. After construction of the Dam improvements, a double seal coat would be placed as a minimum-wear surface. Fifteen-inch diameter culverts with inlet structures would be installed at approximately 400-foot intervals for drainage.

About 1,100 feet from Carmel Valley Road the access road must cross the existing 30-inch diameter discharge line from the CVFP. This pipe is supported approximately three feet above the ground by concrete piers at approximately every joint. This crossing is also located on a ridge at a saddle. The proposed access road would pass over the pipe. This will require removal of the concrete pipe supports and subsequent burial of the pipeline below the planned road surface.

Beyond 1,300 feet from Carmel Valley Road towards the CVFP, the proposed access road is on flat land where little grading is required. From 2,700 feet from Carmel Valley Road, the proposed access road follows an existing single lane road until about 4,300 feet from Carmel Valley Road. At approximately 3,250 feet from Carmel Valley Road the road crosses over the existing 30-inch diameter pipeline again. At approximately 3,900 feet from Carmel Valley Road, the alignment connects with existing pavement next to the CAW caretaker's house. The existing pavement would be widened to two lanes to approximately 4,300 feet from Carmel Valley Road. At this point the two-lane road could be split into two one-lane roads: the existing single-lane paved road leading up to and beyond the existing water tanks to San Clemente Drive (approximately 900 feet), and the pipeline access road, which also joins San Clemente Drive.

Access from Existing Gate to San Clemente Dam

San Clemente Drive is a one-lane unpaved service road with turnouts from the locked gate (at San Clemente Drive Station Sta 51+80; refer to Figure 3.2-2 for station reference location) to the junction of the upper and lower dam roads, a 3,200-foot-long reach. Under the Proposed Project, this section is to be widened where conditions warrant, providing an 11 to 12-foot road width for one-way, controlled traffic. Rock outcrops or trees may make two-way travel difficult on several short segments of this route. This may be acceptable provided there is adequate sight distance for approaching vehicles. The General Contractor can also use flagmen, radios, and designated pullouts to control two-way traffic on one-lane access roads.

San Clemente Drive splits at the concrete ford over the Carmel River (near Sta 83+00), with one lane providing access to the base of the Dam, and one lane providing access to the top of the Dam. The low road to the top of the Dam crosses Carmel River at the OCRB. The OCRB has an overall length of approximately 200 feet and requires structural improvements to carry heavy trucks. These improvements would consist of

replacing the existing piers with stronger and more deeply set piers, resetting the steel structure and replacing the wood deck with a wider, stronger steel deck. Two piers that extend approximately 15 feet above the OCRD crest currently support a bridge constructed of steel I-beams with timber decking and guardrails. The bridge is supported by the two intermediate piers as well as abutments at either end of the bridge on the river's northern and southern side, completing the bridge span and access road connection across the Carmel River. The southern bridge abutment is reinforced by a masonry wall that extends down to the edge of the river bank.

The existing OCRB would require structural improvements in order to accommodate heavy loads from construction equipment using the bridge to access the SCD left abutment and as part of the one-way access route for construction traffic (for the Proponent's Proposed Project only). The new bridge will be designed to handle double-axle loads (Caltrans category H1544, Type 3 legal loads), whereas the current bridge is rated to handle only light duty traffic.

In addition, approaches to the bridge would need to be modified for long loads. The new alignment of the bridge would change slightly by moving the north bridge abutment approximately 10 feet west. The bridge improvements would include:

- Demolition and replacement of the existing piers just upstream of OCRD with stronger and more deeply set, 4-foot diameter drilled piers;
- Excavation of a new foundation at the northern abutment;
- Demolition and replacement of the existing beams that support the bridge on the abutments;
- Removal (prior to pier demolition) and then resetting the steel structure (i.e., I-beams that support the bridge deck); and
- Replacing the wood deck with a wider, stronger steel deck.

The high road access to the Dam begins at the junction with the low access road. This road is a single lane and climbs approximately 500 feet then drops almost 400 feet to the top of the Dam, an overall distance of approximately 10,500 feet. The road requires grading and some widening, cut or fill slope stabilization, and vegetation removal.

At the OCRD, an existing unimproved single lane road follows the East Side of the Carmel River to the plunge pool at the base of the Dam ("plunge pool access road"). This road has been in limited use and has a number of washouts from the 1995 and 1998 floods. The roadbed would be filled with sand and gravel and topped with crushed rock to create a safe, uniform surface. This road can be upgraded with minimum tree pruning and removal to provide one lane, two-way access and designated pullouts.

The majority of truck traffic would use the low road and plunge pool access road to the staging and work area at the base of the Dam. It is possible that the low road could be the route for "inbound" traffic to the top of the Dam and the high road could be the route for "outbound" vehicles, for materials that are brought to the top of the Dam.

Pipeline Access Road

A 3,000-foot-long existing dirt road (pipeline road) begins at the southerly end of the filter plant and parallels the raw water pipeline to the Dam until it joins San Clemente Drive. Because of a switchback and its steep grade, this road could be used by empty trucks returning to the batch plant as a partial one-way loop. After leaving the filter plant, the pipeline road immediately crosses over the pipeline and heads south adjacent to the westerly side of the exposed pipeline. Within 300 feet of the crossing, the road narrows. There are three sections of this road that are between 9.0 and 9.5 feet wide. Attempts have been made to install wooden retaining walls (one to two feet high) to retain the fill on the downhill side. These retaining walls are failing and would not stand up to 10-wheel truck traffic. Clearing of limbs and grading to a smooth surface would be necessary. The road passes over the raw water pipeline at three locations. Sufficient cover over the pipeline must be maintained to prevent damage to the pipeline.

The three narrow sections would require widening to approximately 11 feet for use by construction equipment. Retaining walls approximately 30 to 50 feet long and up to three feet high would need to be installed. A switchback near the southern end of the road would be improved, but there may not be sufficient space for a 10-wheel truck to make a continuous turn without having to stop and back up at least one time.

From the switchback, the road rises over a distance of 400 feet to join San Clemente Drive (San Clemente Drive approximate Sta 64+50). Most of this section of road (approximately 300 feet) is at a 21 percent grade. Because of the switchback, which probably would require one back-up movement to negotiate, and the 300 feet of 21 percent grade, it is likely the pipeline access road would only be used for empty vehicles during construction.

3.2.6 FISH PASSAGE

Old Carmel River Dam (OCRD) Fish Passage Improvements

The OCRD, approximately 1,800 feet downstream of SCD, was built in 1893. This 32-foot high masonry-faced dam was originally constructed as a water diversion facility, but no longer serves any diversion function. It is approximately 140 feet long, 8 feet wide at the base and 4 feet wide at the crest. A pool and weir fish ladder is located on the left bank (looking downstream) of the Dam, constructed in part by excavating rock from the steep wall of the canyon. The right bank contains an open passageway approximately 4 feet wide by 15 feet high that at one time was equipped with a gate and operated as a sluiceway and control to raise water levels for operation of a diversion. This structure was modified in 1992 and 2000 by removing several stoplogs and the gate structure from the passageway.

The OCRD was retrofitted with a fish ladder on the west side (left, looking downstream) about the time that SCD was constructed. Significant problems with adult upstream fish passage at OCRD have been documented. These include poor attraction flow and rock and debris jams in the fish ladder, causing the majority of fish to bypass the ladder and attempt to jump the Dam. The thick dam crest creates an area of local high velocity that often results in fallback of fish that successfully jump the Dam. Therefore, the project proposes to notch the east end of the OCRD (right side in downstream) about 9 feet deep and 19 feet wide to improve low flow passage without inducing geomorphic changes to the downstream pool configuration. The proposed OCRD notching and bridge improvements are shown in Figures 3.2-10 and 3.2-11).

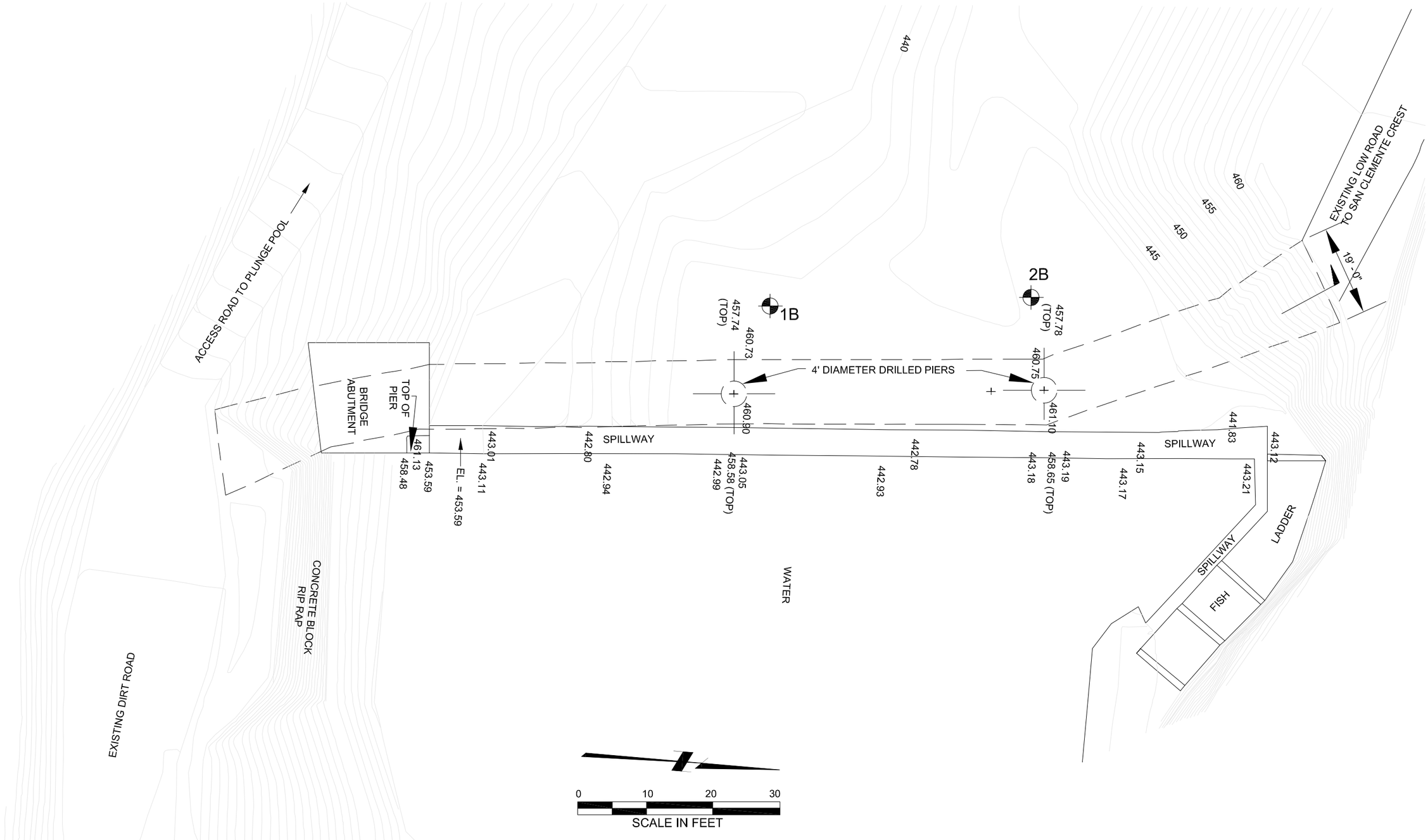
San Clemente Dam Fish Ladder Replacement

The existing fish ladder does not conform to current fish ladder criteria. It would be removed and replaced with a vertical-slot ladder. The ladder would be demolished after the migration season ends (June) to make way for grading and framing a new ladder.

The new ladder would be poured and finished by late summer/fall in time for fish to use it in the next migration season.

The proposed ladder entrance is located on the left bank (looking downstream) of the plunge pool, near the location of the existing ladder entrance. The proposed ladder exit is located on the left abutment at the top of the Dam, approximately 68 feet in elevation above the plunge pool water surface level. The transportation channel of the proposed ladder would be comprised of 68 pools, each having typical dimensions of 10 feet long by 8 feet wide, resulting in an average slope of 10 percent and a total length of 730 feet (including entrance, outlet and resting pools). The proposed layout divides the transportation channel into four segments; each connected by a switchback that also serves as a resting pool (Figure 3.2-12)

The conceptual fish ladder hydraulic operating conditions are summarized as follows. For stream flows up to 55 cfs, all flow would pass through the proposed ladder. For stream flows in the range of approximately 55 to 115 cfs, most of the flow (55 to 62 cfs) would pass through the proposed ladder. The remaining flow would spill over the lower, center spillway (at Elevation 525.0 feet). Above stream flows of approximately 115 cfs, spill would also occur at the higher two spillway segments (Elevation 525.5 feet). The high design flow of 773 cfs (based on five percent exceedence) is expected to occur at approximate reservoir Elevation 526.7 feet. At this elevation, approximately 73 cfs would pass through the proposed ladder, while approximately 700 cfs would pass over the spillway. At the low fish passage design flow, there would be approximately 2 feet of water depth in the vertical slot above the 12-inch sill, resulting in a pool depth of about 3 feet.



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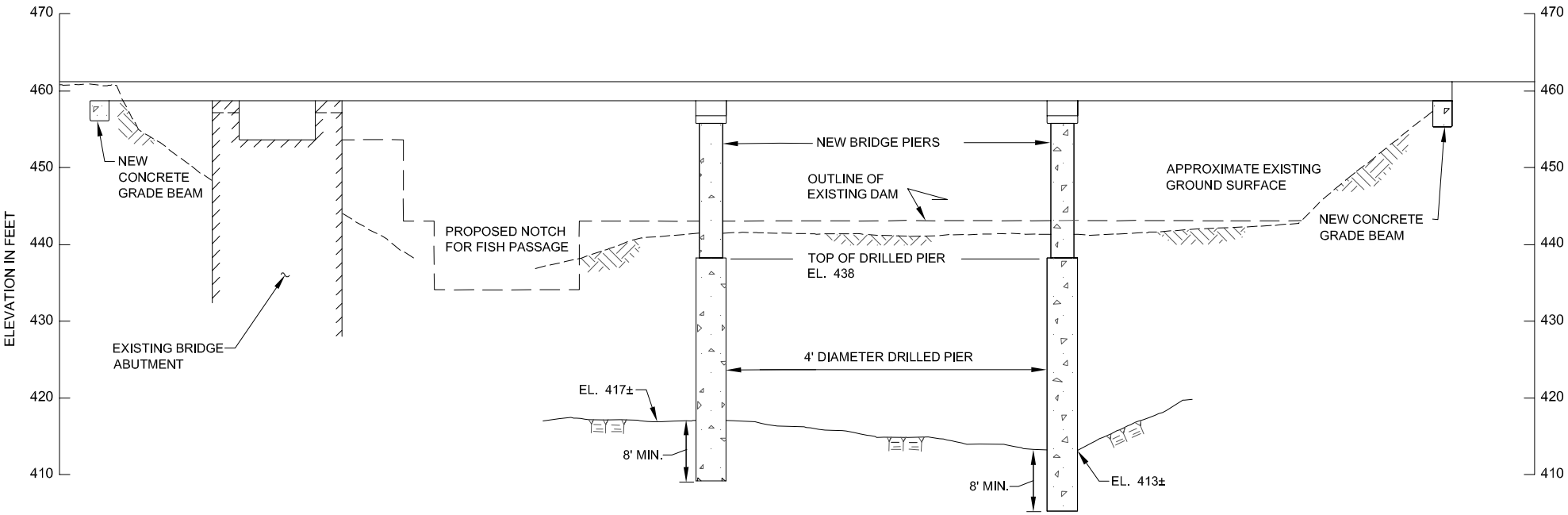
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
OLD CARMEL RIVER DAM BRIDGE PLAN

FIGURE #



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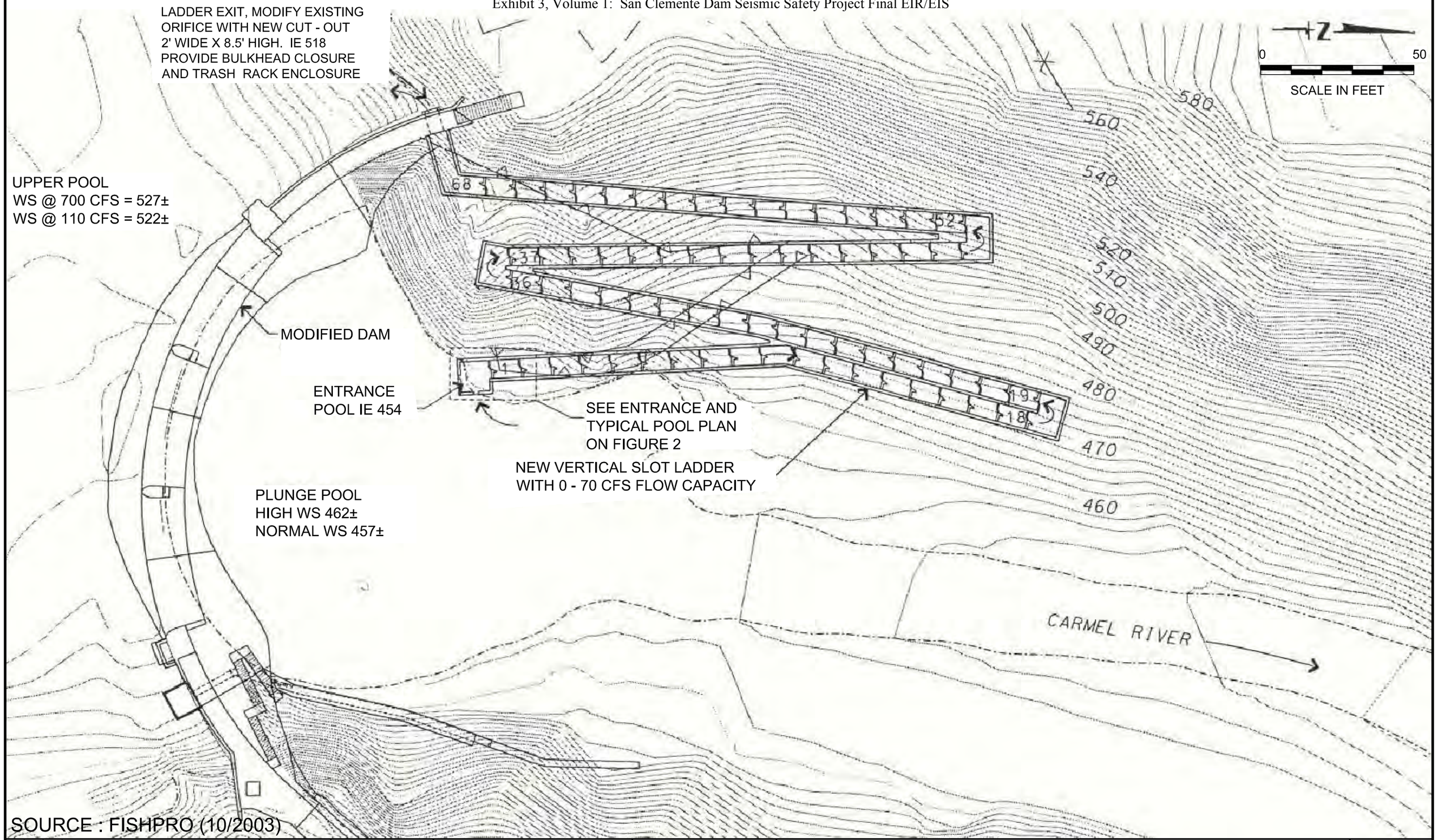

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California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
FISH LADDER PLAN

FIGURE #

The proposed ladder would be equipped with baffle walls at 10-foot intervals that create 68 standard pools within the transportation channel. Each baffle wall would have a 15-inch-wide vertical slot that extends the full height of the channel, except for a 12-inch-sill located at the bottom of the slot (Figure 3.2-13). At 70 cfs flow, the water depth would be approximately 8.5 feet above the top of the sill, and there would be a consistent velocity of approximately 6.6 feet per second through the slot regardless of depth. A total depth of 12 feet in each step of the ladder (including the 1-foot sill) would give the ladder a maximum capacity of approximately 90 cfs. The entire ladder would be covered with grillage to prevent fish from jumping out of the ladder, as well as to prevent falling rock from entering the ladder.

The entrance pool for the proposed ladder (located in the plunge pool) would be designed to provide a minimum of 3 feet water depth under low flow conditions. Given the estimated low water surface at Elevation 457 feet, the entrance pool would have an estimated floor at Elevation 454 feet.

The existing ladder exit orifice (at the upstream face of the Dam) would be modified to achieve proposed hydraulic operating conditions in which all stream flow up to 55 cfs would be routed through the ladder. The existing orifice is 4 feet wide by 2 feet high with invert at Elevation 524.5 feet. The proposed ladder exit would lower the invert to Elevation 518.0 feet and would provide a 2-foot wide slot that is 8.5 feet high. The ladder exit would be equipped with a trash rack on the upstream face of the Dam, and it would have a bulkhead closure to allow ladder closure for maintenance or for protection under extreme high flow conditions. Dredging may be used to establish a fish passage channel prior to the beginning of each migration season.

Reservoir Maintenance

The river channel upstream of the fish ladder exit would be regularly inspected to assure that adequate channel depths exist for upstream passage of adult steelhead. When necessary, and when flow and rainfall conditions are met, sediment management operations would be conducted to maintain the upstream river channel for fish passage (see the Sediment Operations and Management Plan [SOMP] for Fish Passage, Appendix J for further detail).

The sluice gate and associated sluice way will be installed through the Dam at invert elevation of 515 feet, offset 10 feet horizontally and 2.7 feet vertically (down) from the fish ladder invert (Figures 3.2-5 and 3.2-6). The sluice way will be constructed by sawcutting a 10+ foot diameter orifice into the existing dam and inserting a 10 foot nominal diameter steel liner to complete passage through the thickened dam to the downstream face. The 10-foot internal diameter sluice gate, constructed of steel and cast iron (Figures 3.2-5 and 3.2-6), will be anchored to the Dam upstream face and remotely operated by an automated gate opening mechanism. The automated operating mechanism and manual emergency crank will be located at the Dam crest, where a physical connection to the gate via a threaded steel bar is turned to lift the gate for opening and closing.

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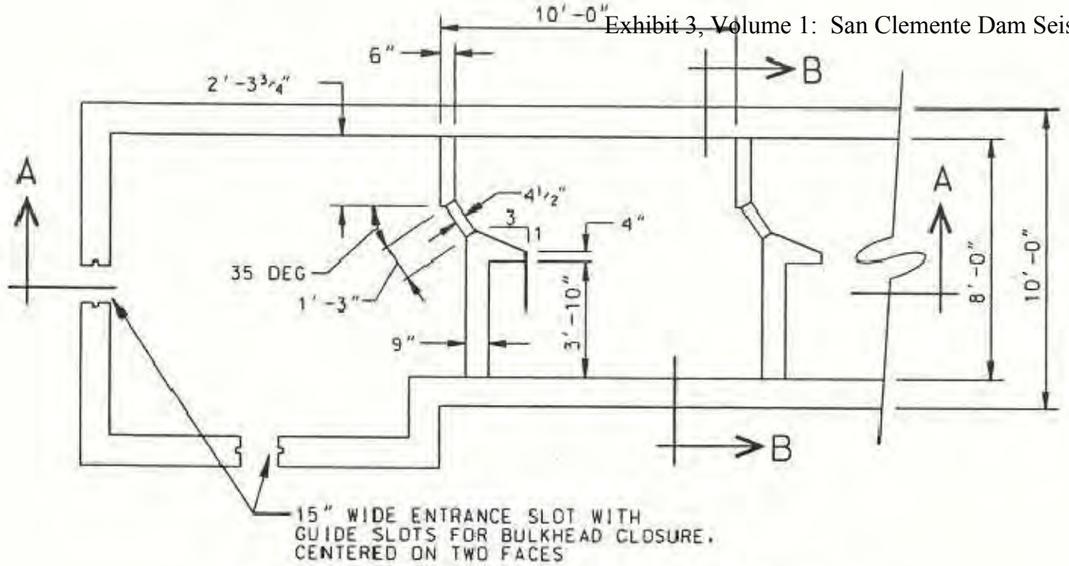

ENTRANCE AND TYPICAL POOL PLAN

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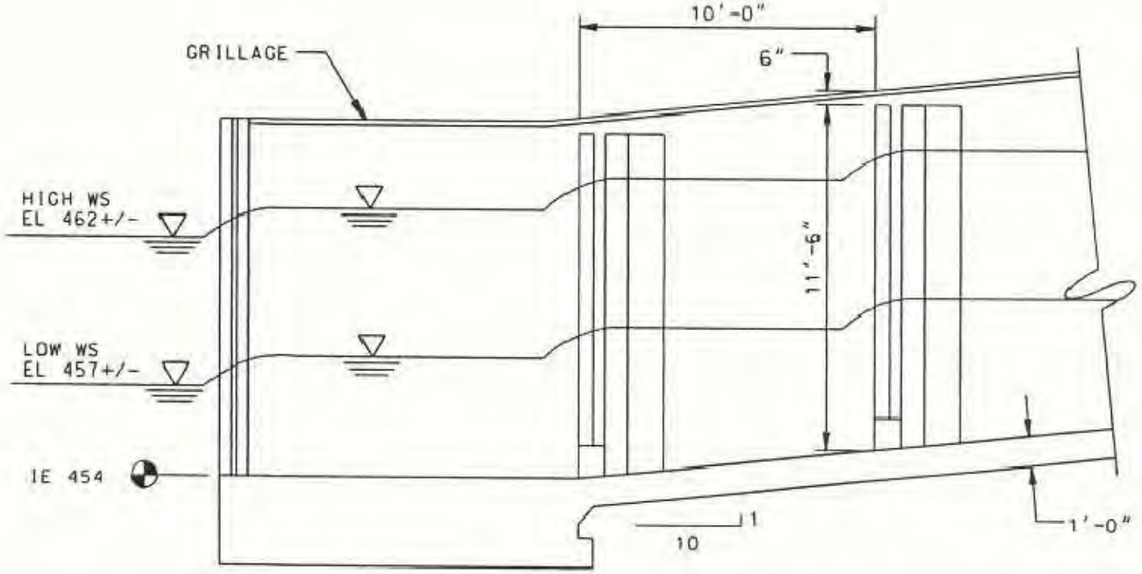

SECTION AA

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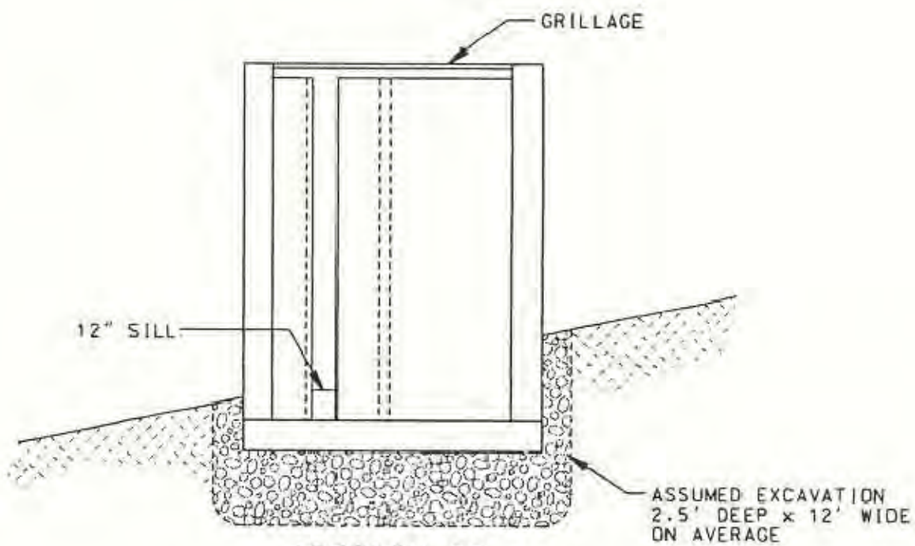

SECTION BB

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SOURCE : FISHPRO (10/2003)

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SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
FISH LADDER ALTERNATIVES

FIGURE #

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3.2.7 CONSTRUCTION SCHEDULE AND OPERATIONS

A conceptual schedule is presented in Figure 3.2-14. Following the State Notice of Determination (NOD) and Federal Record of Decision (ROD), final engineering studies would begin in CY 2. Preparation of final design drawings for the Dam, development of studies and design drawings for the fish ladder, and bidding of a construction contract package would occur in CY 3. Actual schedules will vary depending on when work begins.

Construction will occur in two distinct phases. Phase 1 generally includes mobilization, construction of the new Tularcitos Access Road to the CVFP, OCRD bridge improvements, road aggregate delivery, improvements to existing access roads and demobilization. Phase 2 includes the seismic retrofit of the Dam and fish ladder construction, including mobilization, delivery of concrete aggregate, reservoir dewatering and diversion, foundation excavation for the Dam thickening and fish ladder, concrete placement for both dam and fish ladder, valve and gate installation, joint grouting, and demobilization.

The majority of the work in Phase 1 is planned to take approximately 10 months between December of CY 2 and October of CY 3. Phase 2 is planned to take approximately one year beginning in February of CY 4 and concluding the following February.. Fieldwork in the reservoir area would start on or about February 25. Installation of the dewatering system is estimated to take one month, with closure of the cofferdams on or about May 31. Fish rescue and drawdown of the reservoir and plunge pool would continue until about June 30. In-stream construction operations would take place from June to December of the CY 2. Placement of the concrete would be completed in prior to commencement of the rainy season. Removal of cofferdams and demobilization of in-stream construction operations would occur from December of year to February of CY 5.

From January to February of CY 5, only minor activities are planned, including joint grouting valve installation and testing, and electrical, instrumentation and controls completion. Joint grouting would begin at least 90 days after each individual section of concrete has been poured and only when any uncontrolled spills have been eliminated. The upper portions of the Dam thickening outside of the spillway would be scheduled for grouting last. In wetter years this would mean final joint grouting could end several months later during the next dry season.

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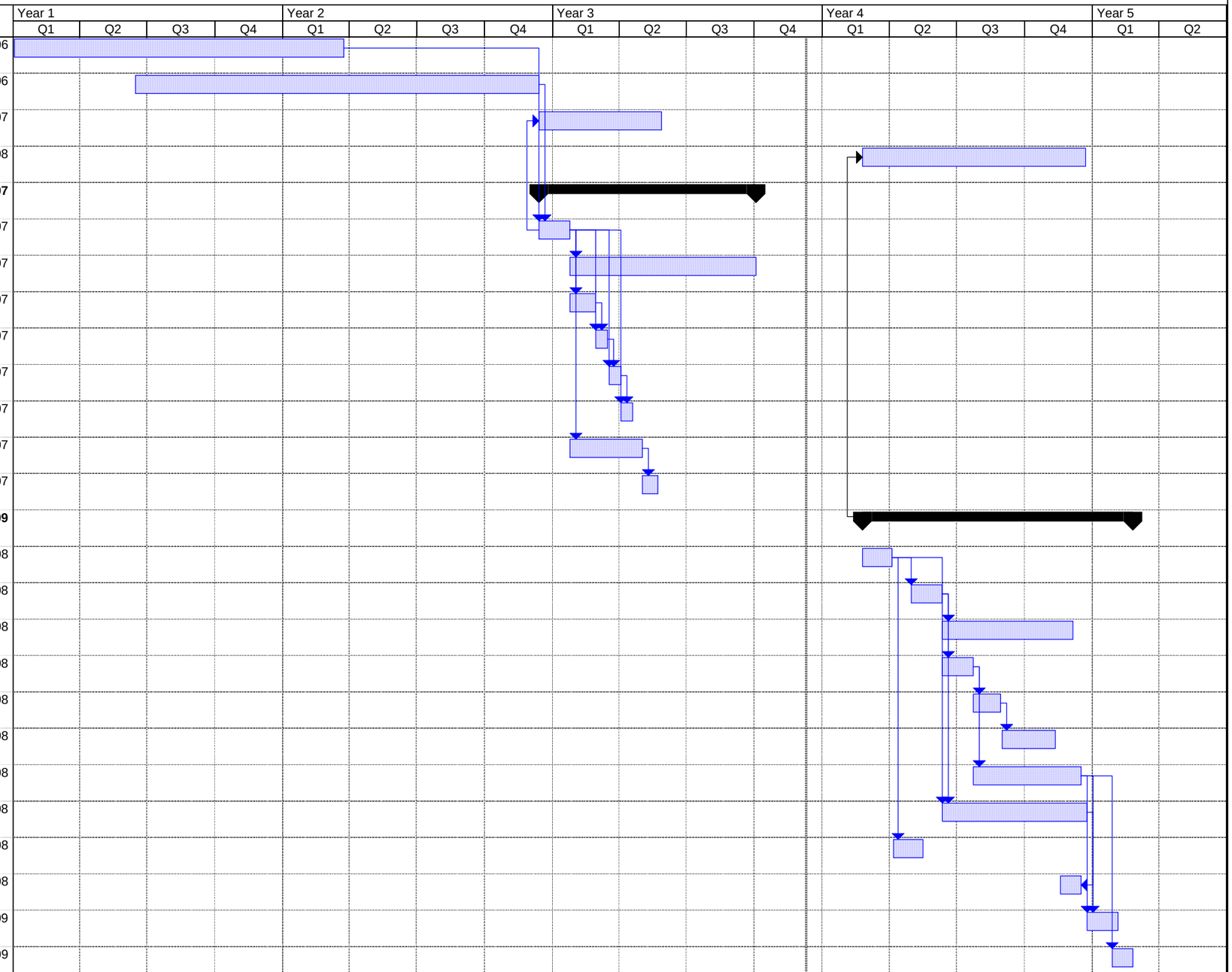
Figure 3.2-14 SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT
PROPONENT'S PROPOSED PROJECT
CONCEPTUAL SCHEDULE

ID	Task Name	Duration	Start	Finish
1	PERMITTING	320 days	Mon 1/3/05	Fri 3/24/06
2	ENGINEERING DESIGN	390 days	Thu 6/16/05	Wed 12/13/06
3	SH &CRLF MIT MONTORING PHASE 1	118 days	Thu 12/14/06	Mon 5/28/07
4	SH &CRLF MIT MONTORING PHASE 2	216 days	Mon 2/25/08	Mon 12/22/08
5	**PHASE 1**	**210 days**	**Thu 12/14/06**	**Wed 10/3/07**
6	MOBILIZATION	30 days	Thu 12/14/06	Wed 1/24/07
7	ACCESS ROAD UPGRADE	180 days	Thu 1/25/07	Wed 10/3/07
8	PIPELINE ACCESS	25 days	Thu 1/25/07	Wed 2/28/07
9	TRAFFIC CONTROL SECTION	12 days	Thu 3/1/07	Fri 3/16/07
10	LOW ROAD ACCESS	12 days	Mon 3/19/07	Tue 4/3/07
11	HIGH ROAD ACCESS	12 days	Wed 4/4/07	Thu 4/19/07
12	BRIDGE WORK	70 days	Thu 1/25/07	Wed 5/2/07
13	DEMOBILIZATION	15 days	Thu 5/3/07	Wed 5/23/07
14	**PHASE 2**	**262 days**	**Mon 2/25/08**	**Tue 2/24/09**
15	MOBILIZATION	30 days	Mon 2/25/08	Fri 4/4/08
16	INSTALL DEWATERING SYSTEM	30 days	Thu 5/1/08	Wed 6/11/08
17	DEWATERING & CARE OF WATER	127 days	Thu 6/12/08	Fri 12/5/08
18	EXCAVATION AT DAM BASE	30 days	Thu 6/12/08	Wed 7/23/08
19	EXCAVATION AT ABUTMENTS	27 days	Thu 7/24/08	Fri 8/29/08
20	ABUTMENT PROTECTION	52 days	Mon 9/1/08	Tue 11/11/08
21	CONCRETE	104 days	Thu 7/24/08	Tue 12/16/08
22	FISH LADDER	140 days	Thu 6/12/08	Wed 12/24/08
23	BUTLER BUILDING	30 days	Mon 4/7/08	Fri 5/16/08
24	CATWALK	20 days	Wed 11/19/08	Tue 12/16/08
25	DEMOBILIZATION	30 days	Thu 12/25/08	Wed 2/4/09
26	JOINT GROUTING	20 days	Wed 1/28/09	Tue 2/24/09



Project: SAN CLEMENTE THICKENING
Date: Mon 12/10/07

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

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Construction Crews

The requirements for labor, which affects the number of vehicle trips to and from the site, vary from an approximate average of 15 workers per day during Phase I (road construction and improvements scheduled for one season for approximately eight months), to an approximate average of 60 workers per day during Phase II (dam rehabilitation and fish ladder construction). A maximum of about 80 workers would be needed during July through October when forming and concrete placement would occur for the Dam and the fish ladder. Construction crews could be transported to work in car pools to minimize construction traffic.

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3.3 ALTERNATIVE 1: DAM NOTCHING

3.3.1 OVERVIEW

This alternative would notch SCD to guard against failure from an MCE and a PMF, as described in Section 3.2. It would meet the need to reduce seismic and PMF safety risks by notching the Dam to approximately elevation 506 feet in the area of the existing spillway bays. Accumulated sediment behind the Dam would be removed down to the level of the notch. Approximately 1.5 million cubic yards (930 AF) of accumulated sediment would be removed from behind the Dam over three seasons by excavation with heavy earthmoving equipment. A conveyor-belt system would be used to transport the sediment to a disposal area east of the reservoir.

The existing fish ladder at SCD would be replaced to accommodate the new spillway and reservoir height. In addition, a notch would be cut into OCRD, which is about 1800 feet downstream of SCD, in order to provide adequate fish passage. The river channel exposed through partial removal of sediment in the historic reservoir inundation zone would be reconstructed.

During the active construction seasons, the Carmel River and San Clemente Creek would be diverted and the reservoir would be dewatered around the reservoir and dam site. CAW's new diversion intake would be installed upstream to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply. The intake would divert through a separate temporary bypass line around the construction site into CAW's existing system. The permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process.

This project is expected to take six years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, dam notching, and channel reconstruction. The schedule could be affected by the effects of annual precipitation on river flow conditions in the spring. Construction activities necessary to complete the project are summarized below. Improvements to and/or new roads as part of the proposed project are also conceptually described.

3.3.2 PROJECT LOCATION & ACCESS

The project study area, area of potential effect, facilities, and land ownership are described in Section 3.2. Figures 3.2-1 and 3.2-2 depict the project region and vicinity, respectively.

3.3.3 EXISTING STRUCTURE & OPERATIONS

SCD and reservoir associated facilities; dam and reservoir operations, the CVFP, the existing fish ladder, and current provisions for fish passage are described in Section 3.2.

3.3.4 PROJECT CHARACTERISTICS

This section describes the SCD dam notching project, including modification of the CAW water diversion point; electrical system; sediment excavation, transport and disposal; access roads; stream diversion and reservoir drawdown and dewatering; and replacement of the fish ladder. It also summarizes construction activities necessary to complete the project.

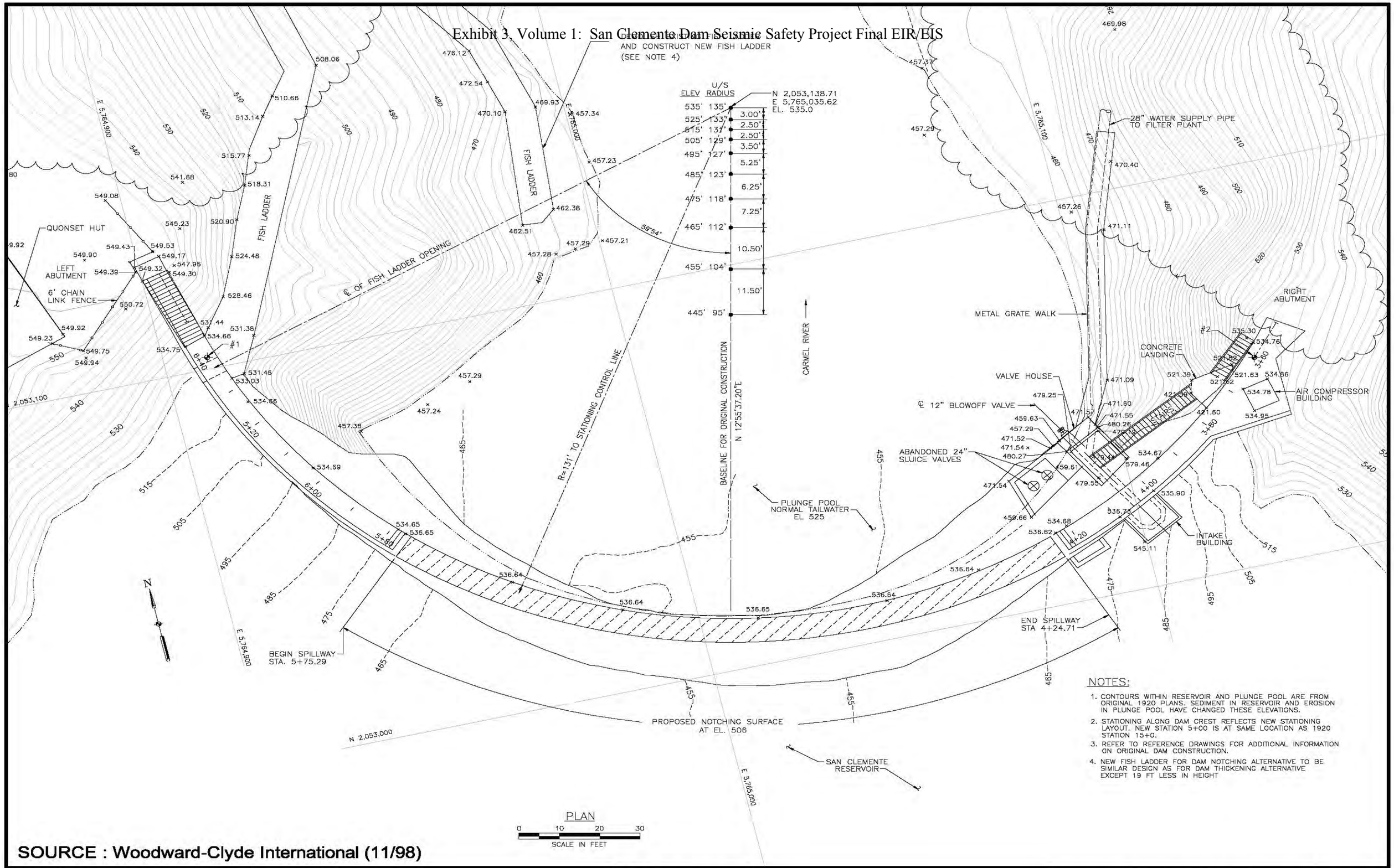
Dam Notching

Notching SCD to approximately elevation 506 feet in the area of the existing spillway bays would reduce the pressure on the Dam sufficiently to avoid catastrophic failure of the Dam during a MCE event. Notching to this elevation would also be sufficient to prevent overtopping of the Dam during the PMF. the Dam notching plan and profile is illustrated in Figures 3.3-1 and 3.3-2.

Notching would not proceed until sediment removal is complete (see discussion below). As shown on Figure 3.3-2, the existing spillway piers, gates, catwalk, and the concrete that forms the existing dam directly under the spillway would be removed down to about elevation 503 feet. A new concrete overflow weir would be constructed above the saw-cut surface to provide a hydraulically smooth overflow section with invert elevation at 506 feet. The new concrete would be tied to the existing concrete using reinforcing steel dowels. The new wing walls due to deepening of the spillway will be reinforced for safety if needed. The deepening of the spillway opening and the removal of the intermediate piers would increase the spillway capacity from the existing 20,000 cfs to the PMF peak flow of about 81,000 cfs when the reservoir water surface is at the parapet elevation.

The plunge pool downstream of the Dam would be completely drained prior to dam notching to allow access for construction workers and machinery for notching operations and new fish ladder construction. To keep the plunge pool staging area dry during construction, two cofferdams would be installed as described in Section 3.2

Notching would be accomplished by saw-cutting the concrete in large blocks. Approximately 700 cubic yards of concrete would be removed. A large tower crane would be used to remove the sawcut concrete blocks and to place the new concrete at the Dam and fish ladder. The crane would be located downstream of the Dam in the drained plunge pool to provide adequate access to the Dam and fish ladder. The concrete blocks would then be further broken up into pieces of sizes that could be loaded and transported by off-highway trucks to the sediment disposal pile for use in erosion control. A large excavator equipped with a hydraulic hammer would be used to reduce the size of the concrete blocks as needed. Light blasting may also be used to break up the largest concrete pieces into smaller, more manageable pieces.



NOTES:

1. CONTOURS WITHIN RESERVOIR AND PLUNGE POOL ARE FROM ORIGINAL 1920 PLANS. SEDIMENT IN RESERVOIR AND EROSION IN PLUNGE POOL HAVE CHANGED THESE ELEVATIONS.
2. STATIONING ALONG DAM CREST REFLECTS NEW STATIONING LAYOUT. NEW STATION 5+00 IS AT SAME LOCATION AS 1920 STATION 15+0.
3. REFER TO REFERENCE DRAWINGS FOR ADDITIONAL INFORMATION ON ORIGINAL DAM CONSTRUCTION.
4. NEW FISH LADDER FOR DAM NOTCHING ALTERNATIVE TO BE SIMILAR DESIGN AS FOR DAM THICKENING ALTERNATIVE EXCEPT 19 FT LESS IN HEIGHT

SOURCE : Woodward-Clyde International (11/98)

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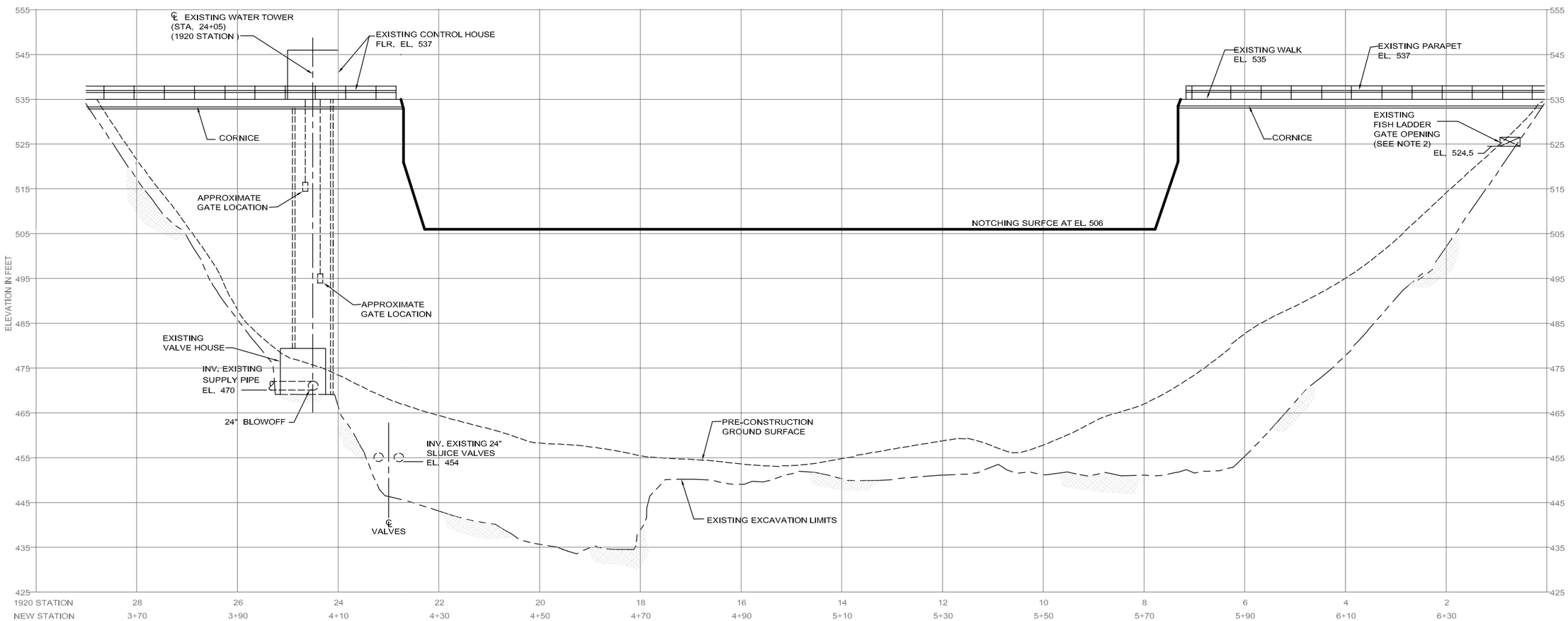
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF DAM NOTCHING

Figure 3.3-1



PROFILE ALONG VERTICAL PROJECTION
OF DOWNSTREAM ARC OF EL. 535
(LOOKING UPSTREAM)

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NOTES:

1. ALL INFORMATION WAS GENERATED FROM ORIGINAL DRAWINGS DATED AUGUST 31, 1920.
2. NEW FISH LADDER FOR DAM NOTCHING ALTERNATIVE TO BE SIMILAR IN DESIGN AS FOR DAM THICKENING ALTERNATIVE, EXCEPT 19 FT LESS IN HEIGHT.

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SEISMIC SAFETY EIR/EIS PROJECT
DAM NOTCHING PROFILE

Figure 3.3-2

Modification of Low-Level Outlet Works and CAW Water Diversion Point

The existing low-level outlet works are described in Section 3.2.

Current CAW infrastructure and operations depend upon a water surface elevation of 525 feet at the point of diversion at San Clemente Reservoir (The Dam's low-level outlet works) to provide the required hydraulic head in the conveyance pipeline between the Dam and the downstream filter plant, to drive the water through the existing filters to the clearwell for distribution. The clearwell provides the hydraulic head for distributing the treated water into the distribution system. Therefore, the point of diversion would need to be replaced at a 525-foot elevation to avoid extensive improvements to the existing filter plant. The maximum anticipated rate of diversion is 16 cfs, although summer diversions are not expected to exceed 3 to 4 cfs. The existing intake at the Dam could not be used for the notching alternative because the 19-foot loss in reservoir height would not meet minimum head requirements.

Based on cost and operational considerations, a subsurface screened intake at the head of San Clemente Reservoir was tentatively selected as the new water diversion point for the Dam notching alternative. This option, similar to a Ranney intake system, would consist of a network of 12-inch diameter stainless-steel perforated pipes embedded in the gravels and cobbles that line the river bottom. The intake pipes would discharge to a common manifold and to a conveyance pipeline. Based on the longitudinal profile of the Carmel Branch developed by MEI (MEI 2003), the screened intake would need to be constructed and maintained approximately 6,000 to 6,500 feet upstream of the Dam in order to provide a diversion at an elevation of 525 feet. The exact location of the intake would need to be determined in the field in conjunction with sediment removal operations. CAW's new diversion intake would be installed upstream to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply. During the construction phase, the intake would divert through a separate temporary bypass line around the construction site into CAW's existing system. The existing 30-inch-diameter steel conveyance pipeline would be extended from its current end at the Dam site to the location of the new intake. This permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process.

The approximate location of the new screened intake and anticipated alignment of the pipeline extension are shown on Figure 3.3-3. The new pipeline would connect to the existing 30-inch pipeline at the downstream toe of the Dam, just upstream of the existing control valves. The existing wye branch, dam outlet valves, and building would be abandoned. Control of flow would be from the filter plant.

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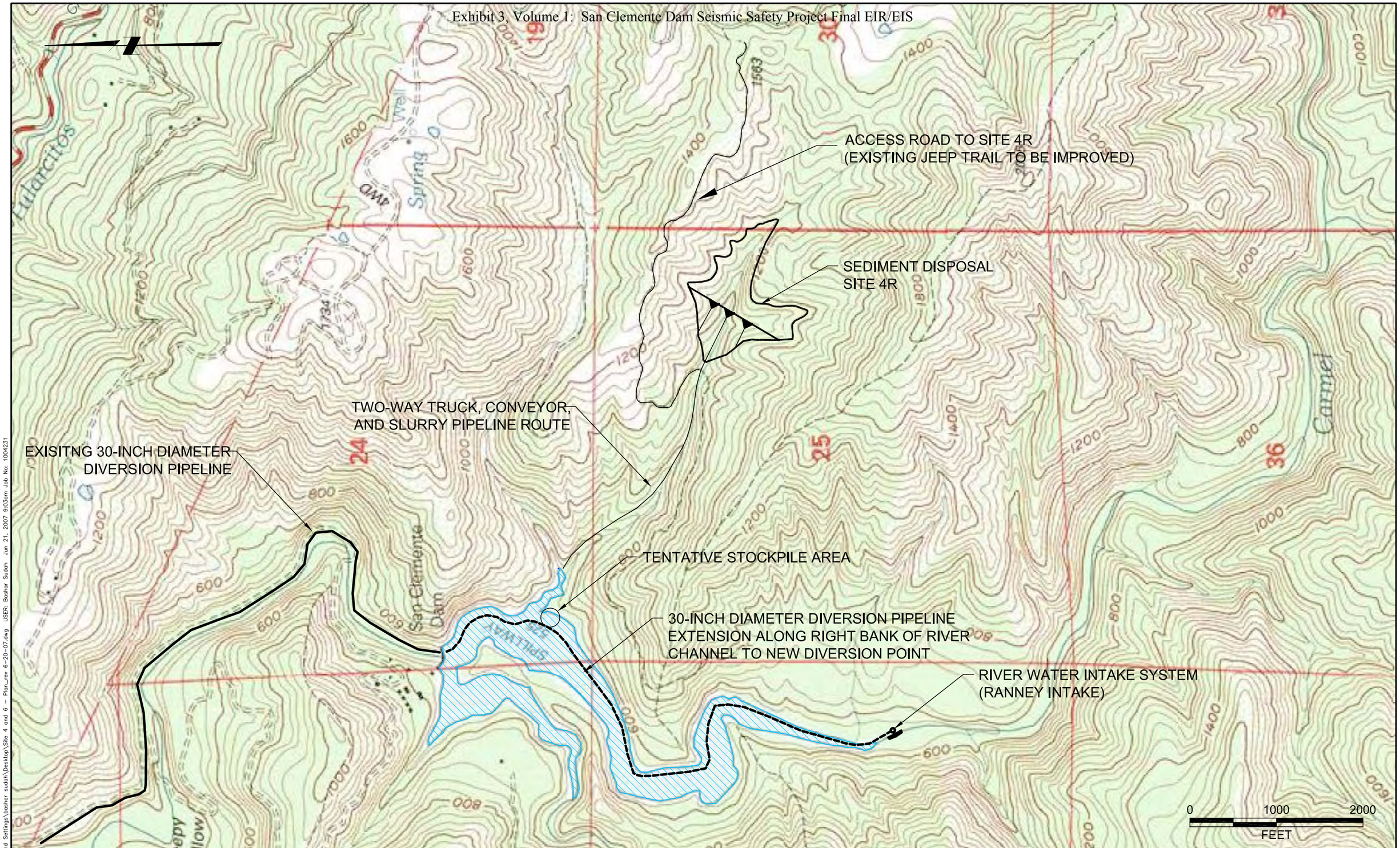

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SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
PLAN OF SEDIMENT DISPOSAL SITE 4R

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High-Level Outlet

A high-level outlet equipped with a sluice gate would be installed during the proposed dam notching in order to provide the ability to make controlled and limited maintenance sediment releases to maintain upstream passage to the fish ladder exit. The sluice gate would be operated as described in Section 3.2. The outlet would be positioned in the left (west) part of the Dam, near the fish ladder exit and below the level of the new spillway crest. The exact location of the outlet would be determined in conjunction with the final design of the fish ladder, following the criteria stated in Section 3.2.

The outlet would be constructed by excavating an oversize conduit through the concrete of the existing dam, placing an inner steel liner in the conduit. Construction details for the outlet and trashrack would be similar to those described in Section 3.2. Minor sediment excavation to allow installation of the gate and trashrack would be accomplished as part of sediment removal operations during the final season of sediment excavation in the reservoir.

Electrical System

The existing electrical service to SCD is supplied by PG&E via an existing 60-kV transmission line from the Laureles substation in Carmel Valley. The 60-kV line follows San Clemente Drive to the High Road intersection, continuing west from that point away from the Project Area. A 12-kV 3-phase pole line branches from the Sleepy Hollow intersection to provide power to SCD, terminating outside an onsite structure above the left abutment of the Dam. Pole mounted transformers provide 3-phase service to the Dam and a nearby CAW-owned residence.

Power requirements for this alternative are governed by the power needs for the conveyor system. The sediment would be transported via connected conveyor segments with 75- to 200-horsepower (HP) (100- to 350-kilowatt [kW]) motors at each segment. Motor load is estimated to total 1,850 HP on an operating basis. Dewatering requirements, construction office trailers, equipment maintenance shop, and night lighting would impose smaller additional loads. Preliminary discussions with PG&E indicate that the configuration of the existing PG&E 60-kV and 12-kV power lines would not be able to handle the total load demand and supply the needed power. Based on preliminary power system evaluations, the most efficient way of supplying the needed power may be to use one or more diesel-power generator sets. A combined capacity of two megawatts would be sufficient to meet project electrical needs. The diesel generator would be comparable to a CAT 3608 TA turbocharged and after-cooled unit, with capacity of 2,000 kW, run in a primary mode (full-time) and equipped with a secondary reduction catalytic device and an add-on particulate filter to meet local air quality requirements.

Sediment Excavation, Transport and Disposal

Accumulated sediment behind the Dam would be removed down to the level of the notch. San Clemente Reservoir has been estimated to contain approximately 2.5 million

cubic yards of sediment (MEI 2003). The sediment consists of sandy gravel, gravelly sand, sand, silty sand, and sandy silt. The finer-grained sediment is located nearest to the Dam in both the Carmel River and San Clemente Creek arms of the reservoir. The coarser (more gravelly and cobbly) materials are encountered in the upper reaches of the Carmel River arm. Previous sediment transport modeling studies determined that removing or notching the Dam and letting the river flush the sediments downstream in an uncontrolled manner would pose unacceptable risks for sediment accumulation and flooding in downstream reaches of the river. To mitigate these risks, notching of the Dam requires the prior removal of the sediment accumulated in the reservoir to a depth (near the Dam) that coincides with the new spillway elevation. Based on recent studies (MEI 2005), the volume of sediment removal would be approximately 1.5 million cubic yards. As a result of the sediment removal efforts, the upstream reaches of the original (pre-1921) Carmel River and San Clemente Creek stream channels would be exposed and require reconstruction.

Several excavation methods (mechanical excavation and hydraulic dredging) are considered feasible (see Appendix G for more detail). Mechanical excavation and transport by conveyor appear to have a slight cost advantage, are simpler, and would have lesser environmental impacts than other methods. The selected approach is described in more detail below.

Sediment Excavation

The sediment would be removed in planes approximately parallel to the existing surface of the sediment in the reservoir. This approach would minimize the amount of sediment movement in the winter. In combination with reservoir dewatering and sediment pre-draining activities described below, it would also help maintain the excavation work above the groundwater level for as long as possible. A portion of the original streambed that existed in 1921 would be exposed in the upper reaches of the Carmel River and San Clemente Creek during the second season of sediment removal operations.

Excavation of sediment above the water table would be performed using self-loading scrapers or similar self-propelled excavating equipment. The scrapers would transport the material to a central stockpile area within the reservoir area, where the material would be allowed to drain further. The stockpile area would be located at the mouth of the ravine where the sediment disposal site is located. The tentative stockpile site, called Site 4R, is shown on Figure 3.3-3.

Sediment Transport

The excavated sediment would be transported to a central stockpile in the reservoir near the mouth of the ravine where Site 4R is located. From the stockpile, a gravity-feed reclaim tunnel system would be used to feed the sediment to a 3,500-foot-long, 36-inch overland belt-conveyor system that would transport the sediment to the site. Gravity feed reclaim tunnel systems are used typically used in mining applications, and consist of a buried hopper (box structure with opening at the top) underneath the excavated

sediment stockpile that collects and deposits sediments onto the conveyor system, a tunnel structure (similar to a half round culvert) that protects the conveyor leading to the hopper, and the conveyor equipment.

The conveyor system would possess a peak capacity of 700 cubic yards per hour. An average sustained rate of 500 cubic yards per hour is assumed for purposes of calculating seasonal production. The belt conveyor would be installed along a 25-foot-wide access road linking the reservoir and the disposal site. The road would be used for access to the reservoir and operation and maintenance of the conveyor. The approximate route and profile of the road and conveyor is shown in Figure 3.3-4. At the disposal site, a traveling radial stacker conveyor would be used to discharge and spread the sediment across the disposal area in preparation for compaction.

Sediment Disposal

Sediment disposal for this alternative would be at Site 4R, located in a relatively steep, undeveloped, forested ravine approximately 3,500 feet east of San Clemente Reservoir. The ravine supports an ephemeral stream that carries local runoff during storm events. Existing access to the ravine is via a Jeep Trail that begins at the Cachagua Grade. The Jeep Trail would need to be improved significantly to enable the mobilization of construction equipment to the site and the reservoir (see discussion below).

A plan of Site 4R and a capacity curve for the site is shown in Figure 3.3-5. The maximum capacity of the site is undetermined but is well in excess of the estimated required volume of 1.5 million cubic yards (ample capacity to store all sediment excavated under this alternative). The toe of the sediment pile would be located at approximate elevation 920 feet. The top of the sediment pile would be at about elevation 1,110 feet in order to contain all of the sediment accumulated in the reservoir. The footprint area of the sediment pile would be approximately 16 acres. The watershed area tributary to the sediment pile site is approximately 252 acres.

The property where Site 4R is located is owned by the Monterey Peninsula Regional Park District (MPRPD). The use of Site 4R as sediment disposal site and access easements would need to be negotiated with the MPRPD.

Site preparation prior to sediment disposal would include (1) the clearing and grubbing of trees and vegetation from the sediment pile footprint, (2) the removal of any existing facilities (none have been identified), and (3) the stripping and stockpiling of organic soils for use in subsequent restoration and revegetation of the site once sediment placement has been completed. In addition, a culvert pipe would likely be placed along the ravine bottom the full length of the site to help manage storm waters and minimize erosion during construction operations. BMPs identified in the SWPPP (Appendix K) would be implemented for site preparation.

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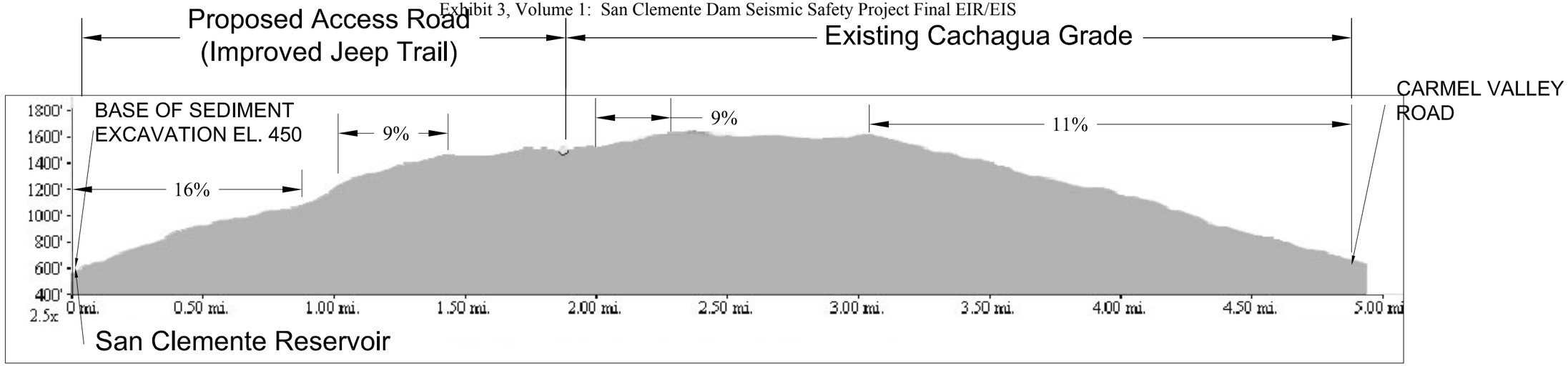
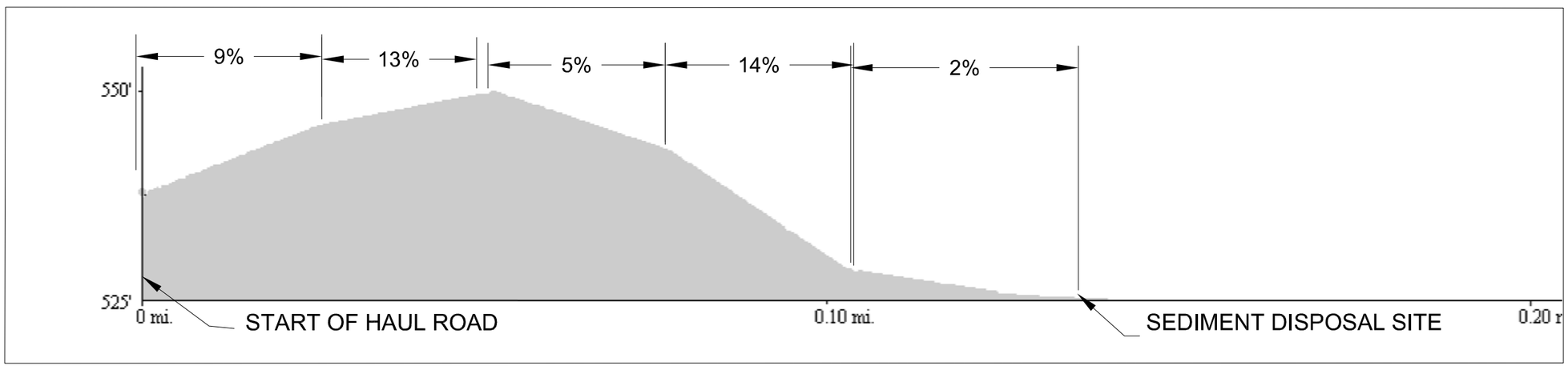
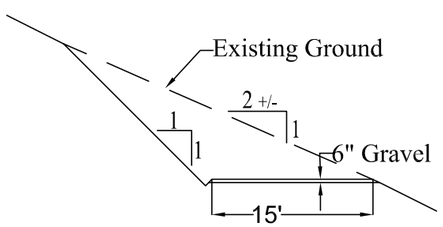


PROFILE OF ACCESS ROAD TO RESERVOIR SITE



PROFILE OF HAUL ROAD



TYPICAL ACCESS ROAD SECTION

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SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILES OF SITE ACCESS AND HAUL ROADS

FIGURE 4

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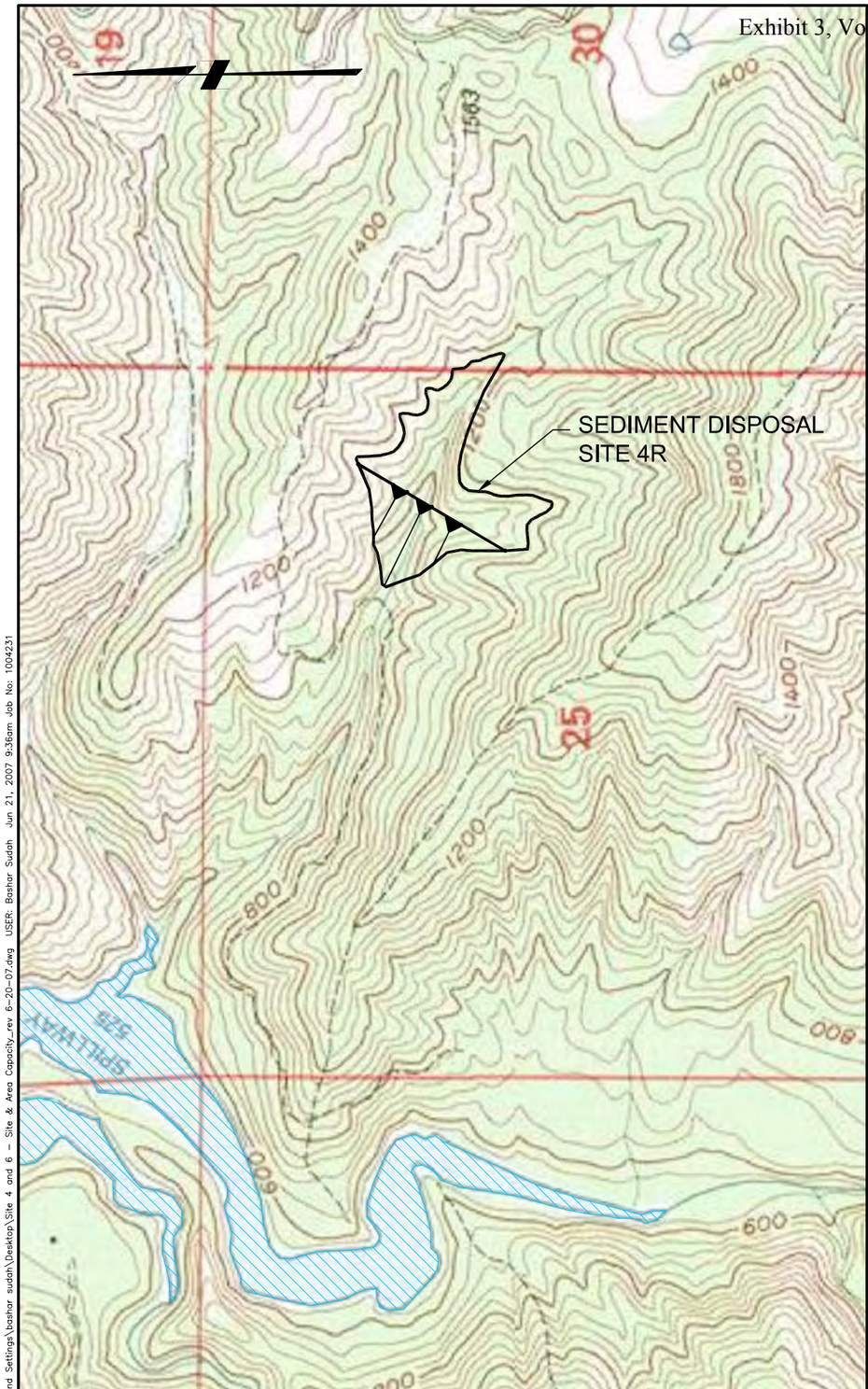

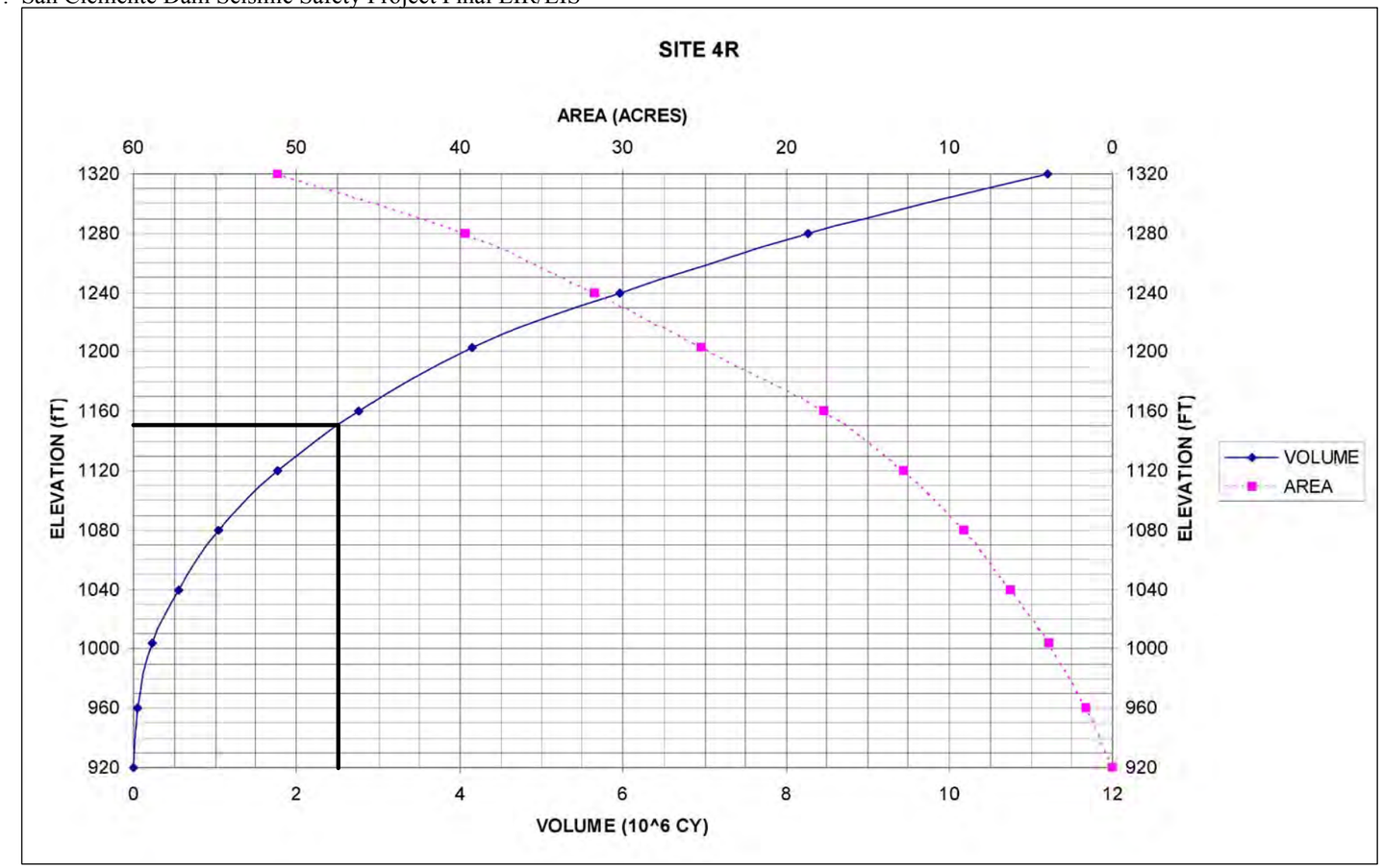

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SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
AREA–CAPACITY CURVES OF SEDIMENT DISPOSAL SITE 4R

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Bulldozers would be used to spread sediment into thin, nearly horizontal lifts. Each lift would be compacted using the bulldozers or vibratory compactors. The sediment pile would be constructed with a stable side slope (averaging 2.75:1). Concrete debris from dam notching could be placed on the pile for long-term erosion protection at the toe of the pile and on the groins along the contact between the pile and the hillside abutments.

At the end of each construction season, the site would be winterized by: (1) providing interim drainage and diversion of ravine flows, (2) stabilizing sloping sediment surfaces and other disturbed areas by installing erosion protection features such as erosion control mats or straw mulch and wattles, and (3) providing sediment collection features such as silt fences, straw bales, and sediment traps along the toe of the pile and other disturbed areas.

Once placement of sediment and concrete debris has been completed, the topsoil from the temporary topsoil stockpile set aside during site stripping would be spread over the sediment pile. The graded surface would be stabilized with erosion control measures as described above and revegetated with native plants and trees obtained from the site vicinity. A typical section for the sediment pile is shown in Figure 3.3-6.

Stream Diversion and Reservoir Drawdown and Dewatering

Both the Carmel River and the San Clemente Creek would be diverted around the active areas of sediment excavation during the construction season. Stream flows would be passed downstream to maintain the flow and habitat in the Carmel River during construction. Within the reservoir area, the reservoir level would be drawn down, and the sediment deposits would be pre-drained to keep the active excavation area as dewatered and drained as possible to enable operation of scrapers and similar self-propelled earthmoving equipment.

A construction requirement for reservoir drawdown constrains the main construction activities to a period when streamflow is low enough to be passed through a bypass pipeline and the Dam outlet works. The target streamflow to divert the Carmel River is assumed to be a flow of about 50 cubic feet per second (cfs) or less. A diversion facility, consisting of an interlocking sheetpile cofferdam, would be installed in the channel at the upper end of the reservoir to divert incoming flows from the Carmel River through a 36-inch-diameter bypass pipeline. The sheetpiles would be driven down through the sediment to bedrock. The upper end of the sheetpiles would extend about five feet above the existing streambed to develop sufficient head at the bypass pipe intake. A removable section would be disassembled annually to allow stream and fish passage during non-construction periods.

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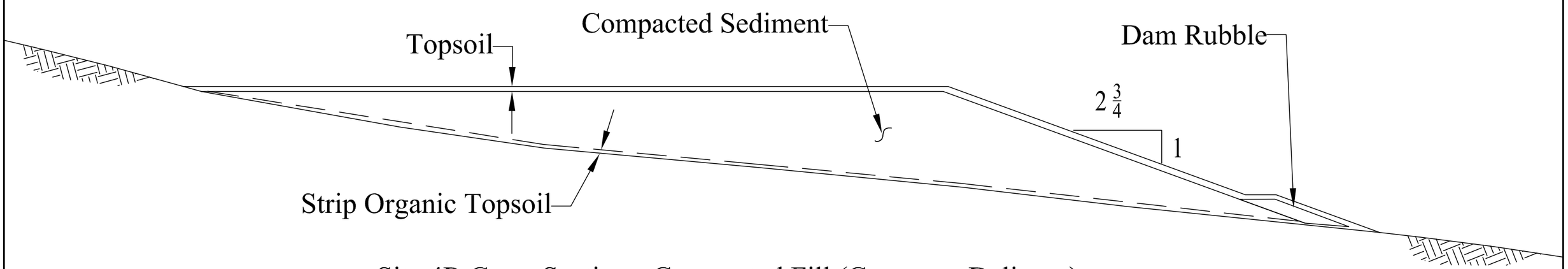

Site 4R Cross Section - Compacted Fill (Conveyor Delivery)

0 200 400
FEET

REV	DATE	BY	DESCRIPTION

SCALE

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED
DRAWN
CHECKED

MWH
Walnut Creek
California

CALIFORNIA AMERICAN WATER
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
SEDIMENT DISPOSAL SITE 4R CROSS SECTION

FIGURE 5

Another sheetpile cofferdam would be constructed across San Clemente Creek to divert it into an 18-inch pipeline. These bypass pipelines would convey the stream flows to some of the existing drawdown ports at SCD and/or to the existing mid-level intake (which may be sealed to keep out turbid water). Water passed through the drawdown ports would discharge to the existing plunge pool downstream of the Dam. Water discharged through the mid-level intake would continue through the existing 30-inch-diameter pipeline approximately 500 feet downstream of the Dam to an energy dissipation structure where the water would be released to the Carmel River bed. During the construction season most of this bypass flow will be released from Los Padres Reservoir upstream.

Prior to commencing excavation, the reservoir would be drawn down below the level of the drawdown ports, if possible, by using the existing mid-level intake structure with gate invert at elevation 494 feet. The reservoir water surface first would be drawn down by gravity to the invert of the drawdown ports at elevation 515 feet and then further lowered to the lowest level possible, approximately elevation 495 feet. However, sediment has accumulated against the upstream face of the Dam to about elevation 510 feet. This sediment deposited at the mid-level intake structure (at elevation 494 feet) would need to be removed to draw the reservoir water below elevation 515 feet. A sheetpile barrier would be installed around the intake. The sediment between the sheetpile barrier and the Dam intake would be removed. After the turbidity has cleared, the reservoir would be lowered to elevation 495 feet. Alternatively, water could be pumped from the deepest part of the reservoir near the central part of the Dam and discharged to the river either by pumping into the outlet works or the drawdown ports.

Reservoir drawdown and sediment excavation operations would be managed to promote pre-drainage of the sediments ahead of the excavation. As the level of the sediment is lowered, drainage trenches would be excavated to drain to low points, from where water would be removed. Water originating from local precipitation, springs, and/or seepage through the stream diversion structures may seep into the construction area, bounded upstream by the diversion structures and downstream by the Dam. This excess water would also need to be drained, conveyed, collected and removed from the excavation. In addition to drainage trenches, well points may be installed within the sediment deposits, as necessary to help capture leakage water and maintain the water surface in the reservoir at the desired level, i.e., below the bottom of the excavation.

Water within the construction area would be turbid due to the earthmoving operations. The remaining pond adjacent to the Dam would be used as a desilting basin during the construction season. At some point the turbidity of the water in the reservoir may be too high for directly releasing it downstream. Excess water from within the reservoir would then need to be treated using a filtration system to remove turbidity and excess iron compounds. The treated water would be discharged to the river.

At the end of the first sediment excavation season, the initial storms that exceed the diversion capacity would fill the reservoir, after which time the diversion pipe would be

disconnected from the sheetpile cutoff and the river flow would be re-established through the reservoir.

For the second sediment excavation season, before re-starting the sediment excavation operation, the water level in the reservoir would need to be drawn down again as described above.

Exact locations of the diversion cutoff walls and pipelines, drainage trenches and well points would depend on the actual sediment level when construction begins, and will be field determined at that time.

3.3.5 PROJECT ACCESS AND IMPROVEMENTS

Existing vehicle access to SCD and the filter plant from Carmel Valley Road is described in Section 3.2. Improvements to these existing access roads are also described in Section 3.2.

Access to Sediment Disposal Site and Reservoir

Road access to the sediment disposal site and San Clemente Reservoir would be established via Cachagua Grade. An existing Jeep Trail that extends between a gated entrance off Cachagua Grade and the sediment disposal site would be improved, and a conveyor-belt system would be installed between the reservoir and the sediment disposal site.

The primary access used to develop the sediment disposal site and access the reservoir would be via Carmel Valley Road and Cachagua Grade. An existing dirt road leads to the sediment disposal site, entering off Cachagua Grade approximately three miles from the intersection with Carmel Valley Road. A locked steel swing gate controls the entrance. "Truck Crossing — 500 Feet" signs would likely be necessary on both Cachagua Grade approaches. Asphalt pavement would be placed at the intersection to protect the Cachagua Grade edge of pavement and to reduce dust at the intersection.

About 1.5 miles of this existing dirt road (from the intersection with Cachagua Grade to the sediment disposal site) would need to be improved to allow access of construction personnel and equipment. Improvement of the existing road would consist of widening the road to a width of 20 feet (minimum width of 15 feet with turnouts for passing in tight reaches), improving the radius of curvature at sharper curves to allow passage of large trucks, and constructing a drainage ditch along the uphill edge of the road. The road surface would have 6 inches of Class II base rock installed. A double chip seal coat would be placed as a minimum wearing surface. Fifteen-inch-diameter or larger culverts with inlet structures would be installed at approximately 400-foot intervals for drainage. The Jeep Trail would be left in its improved condition. No additional maintenance would be required on the Jeep Trail than already exists.

A new 0.5-mile-long access road would be constructed from the disposal site to the reservoir. A typical cross-section is shown on Figure 3.3-5. The road would be excavated along the slope of the ravine and would consist of a 25-foot-wide surface and 3-foot drainage ditch. The excavated slope above the road would be stabilized with small anchors, wire mesh and shotcrete as needed. The road surface would have 6 inches of Class II base rock installed. The belt conveyor would be installed along the outside edge of the road and would be accessible to maintenance equipment operating from the road. The road's travel surface would be sealed with a double chip seal coat. Fifteen-inch diameter or larger culverts with inlet structures would be installed at approximately 400-foot intervals for drainage. This road would be restored to pre-construction conditions after completion of the project.

3.3.6 FISH PASSAGE

Old Carmel River Dam Fish Ladder Improvements

Fish passage improvements to the OCRD are the same as are described for the Dam strengthening project in Section 3.2.

San Clemente Dam Fish Ladder Replacement

The existing fish ladder is described in Section 3.2. The ladder would be demolished after the migration season ends (June) to make way for grading and framing a new ladder. The new ladder would be poured and finished by late summer/fall in time for fish to use it in the next migration season.

The design of the replacement fish ladder would be substantially the same as shown in Section 3.2 (Figure 3.2-12), except shorter. The proposed ladder entrance is located on the left bank (looking downstream) of the plunge pool, near the location of the existing ladder entrance. The proposed ladder exit is located on the left abutment, ascending approximately 49 feet from the pool below. The transportation channel of the proposed ladder would be comprised of 49 pools, each having typical dimensions of 10 feet long by 8 feet wide, resulting in an average slope of 10 percent and a total length of 540 feet (including entrance, outlet and resting pools). The proposed layout divides the transportation channel into four segments, each connected by a switchback that also serves as a resting pool.

The conceptual fish ladder hydraulic operating conditions are summarized as follows. For stream flows up to 55 cfs, all flow would pass through the proposed ladder. For stream flows in the range of approximately 55 to 115 cfs, most of the flow (55 to 62 cfs) would pass through the proposed ladder. The remaining flow would discharge over the spillway (at elevation 506.0 feet). The high flow fish passage condition of 773 cfs is expected to occur at approximate reservoir elevation 507.3 feet. At this elevation, approximately 65 to 70 cfs would pass through the proposed ladder, while just over 700 cfs would pass over the spillway. At the low flow fish passage condition of 15 cfs, there would be approximately 2 feet of water depth in the vertical slot above the 12-inch slot, resulting in a pool depth of about 3 feet.

The proposed ladder would be equipped with baffle walls at 10-foot intervals that create 49 standard pools within the transportation channel. Each baffle wall would have a 15-inch-wide vertical slot that extends the full height of the channel, except for a 12-inch-sill located at the bottom of the slot. At 70 cfs flow, the water depth would be approximately 8.5 feet above the top of the sill, and there would be a consistent velocity of approximately 6.6 feet per second through the slot regardless of depth. A total ladder depth of 12 feet (including the 1-foot sill) would give the ladder a maximum capacity of approximately 90 cfs. The entire ladder would be covered with grillage to prevent fish from jumping out of the ladder, as well as to exclude falling rock from entering the ladder.

The entrance pool for the proposed ladder (located in the plunge pool) would be designed to provide a minimum of 3 feet water depth under low flow conditions. Given the estimated low water surface at Elevation 457 feet, the entrance pool would have an estimated floor at Elevation 454 feet.

The existing ladder exit orifice (at the upstream face of the Dam) would be lowered in a manner consistent with the overall lowering of the reservoir surface. In addition, the exit orifice would be located to achieve proposed hydraulic operating conditions in which all stream flow up to 55 cfs would be routed through the ladder. The existing orifice is 4 feet wide by 2 feet high with invert at elevation 524.5 feet. The proposed ladder exit would lower the invert to Elevation 499.0 feet and would provide a 2-foot wide slot that is 8.5 feet high. The ladder exit would be equipped with a trash rack on the upstream face of the Dam, and it would have a bulkhead closure to allow ladder closure for maintenance or for protection under extreme high flow conditions.

Dredging may be used to establish a fish passage channel prior to the beginning of each migration season

Reservoir Maintenance

Maintenance of the river channel through the reservoir upstream of the fish ladder exit would be the same as described in Section 3.2 for the Proponent's Proposed Project.

3.3.7 PARTIAL RECONSTRUCTION OF THE RIVER CHANNEL AND REVEGETATION OF THE VALLEY FLOOR

Excavation under this alternative would lower the surface of the sediment deposits in San Clemente Reservoir by approximately 19 feet. The new sediment surface in the reservoir would be at about the same grade as the current sediment surface. The partial removal of the reservoir sediment would expose a portion of the pre-1921 alluvial deposits in the river channel and floodplain along the sides and the upstream reaches of the historic reservoir inundation zone, uncovering approximately 2,000 feet of the upstream portion of the Carmel River branch and 900 feet of the San Clemente Creek branch in the current reservoir inundation area.

After the sediment surface is lowered to its planned depth, the following three-stage channel would be provided through selective contouring along both the Carmel River and San Clemente Creek:

- The relatively wide river/creek valley formed by the remaining alluvial deposits;
- A bankfull channel appropriately sized with capacity for a two-year flood event;
- A thalweg (low-flow channel) to pass median annual flows and provide depths needed for fish migration even during low flows.

The broad valley containing the reconstructed stream channel would generally follow the 1921 contours in the upper reaches of the Carmel River and San Clemente Creek and the lowered sediment surface in the portions of the reservoir closer to the Dam. The bankfull and thalweg channels would be reconstructed by limited grading of the existing alluvial deposits. Habitat complexity would be promoted within the channel by constructing pools, runs, and riffles, to provide suitable depth and velocity conditions for steelhead migration. Instream structures such as downed trees and boulders would be placed at strategic locations to improve conditions along the stream channels.

Stabilization of exposed land would be accelerated by planting the exposed reservoir canyon slopes with native upland vegetation. Likewise, once the channel has been contoured, the establishment of riparian vegetation on the lowered sediment terraces would be accelerated through cultivation and planting of selected areas of the valley floor. Native saplings of suitable riparian species would be obtained from nearby reaches of the Carmel River and San Clemente Creek and planted at appropriate densities along the stream banks. Temporary stabilization of stream banks would also be provided using vegetative matter and plantings.

3.3.8 CONSTRUCTION SCHEDULE AND OPERATIONS

A conceptual schedule is presented in Figure 3.3-7. Following the state NOD and federal ROD, final engineering studies would begin in Year 2. These include geotechnical investigations for the sediment site and access roads; design of the access roads and conveyor system; design of the sediment pile including stability and hydrologic analyses; design of the new fish ladder and high-level outlet; design of the new water intake and conveyance pipeline extension; design of the Dam notching; planning and design of stream bypass and dewatering facilities; design of the reconstruction of the Carmel River and San Clemente Creek channels; and design of mitigation or habitat enhancement plans for red-legged frogs and steelhead. A construction contract package is planned to be developed and construction bids solicited late in CY 1, for award in early in CY 2.

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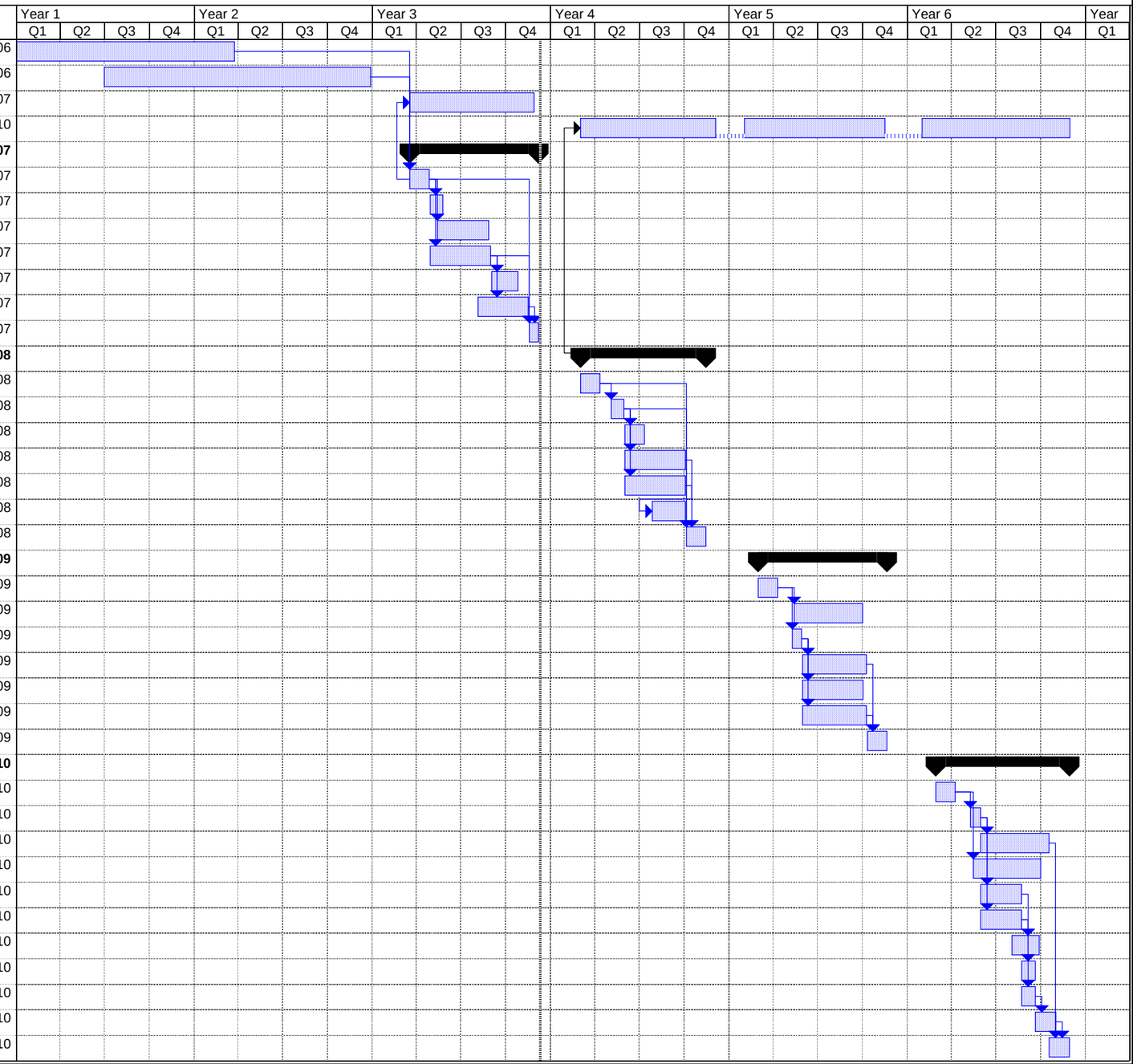
Figure 3.3-7 SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT
ALTERNATIVE 1- DAM NOTCHING
CONCEPTUAL SCHEDULE

ID	Task Name	Duration	Start	Finish
1	PERMITTING	320 days	Mon 1/3/05	Fri 3/24/06
2	ENGINEERING DESIGN	390 days	Fri 7/1/05	Thu 12/28/06
3	SH &CRLF MIT MONTORING PHASE 1	183 days	Mon 3/19/07	Wed 11/28/07
4	SH &CRLF MIT MONTORING PHASE 2	622 days	Mon 3/3/08	Tue 11/30/10
5	**PHASE 1 - PRE-CONSTRUCTION ACTIVITIES**	**190 days**	**Mon 3/19/07**	**Fri 12/7/07**
6	MOBILIZATION	30 days	Mon 3/19/07	Fri 4/27/07
7	SET-UP STREAM DIVERSION	20 days	Mon 4/30/07	Fri 5/25/07
8	INSTALL CAL-AM'S WATER DIVERSION INTAKE AND PIPELINE	75 days	Tue 5/15/07	Mon 8/27/07
9	CACHAGUA GRADE TO RESERVOIR ACCESS ROAD UPGRADE	90 days	Mon 4/30/07	Fri 8/31/07
10	DISPOSAL & RESERVOIR LOADING AREA SITE PREPARATION	40 days	Mon 9/3/07	Fri 10/26/07
11	CONVEYOR FOUNDATIONS, POWER, AND ERECTION	75 days	Mon 8/6/07	Fri 11/16/07
12	DEMOBILIZATION / WINTERIZATION	15 days	Mon 11/19/07	Fri 12/7/07
13	**PHASE 2 - SEDIMENT REMOVAL (SEASON 1)**	**185 days**	**Mon 3/3/08**	**Fri 11/14/08**
14	MOBILIZATION	30 days	Mon 3/3/08	Fri 4/11/08
15	FINALIZE STREAM DIVERSION / INSTALL DEWATERING SYSTEM	20 days	Mon 5/5/08	Fri 5/30/08
16	LOW ROAD & PLUNGE POOL ACCESS ROAD IMPROVEMENTS	30 days	Mon 6/2/08	Fri 7/11/08
17	DEWATERING & CARE OF WATER	90 days	Mon 6/2/08	Fri 10/3/08
18	SEDIMENT EXCAVATION AND DISPOSAL	90 days	Mon 6/2/08	Fri 10/3/08
19	RIVER RESTORATION	50 days	Mon 7/28/08	Fri 10/3/08
20	DEMOBILIZATION / WINTERIZATION	30 days	Mon 10/6/08	Fri 11/14/08
21	**PHASE 2 - SEDIMENT REMOVAL (SEASON 2)**	**190 days**	**Mon 3/2/09**	**Fri 11/20/09**
22	MOBILIZATION	30 days	Mon 3/2/09	Fri 4/10/09
23	INSTALL CAL-AM'S PERMANENT WATER DIVERSION PIPELINE	100 days	Fri 5/15/09	Thu 10/1/09
24	RE-INSTALL DEWATERING SYSTEM/COFFERDAMS	15 days	Mon 5/11/09	Fri 5/29/09
25	DEWATERING & CARE OF WATER	95 days	Mon 6/1/09	Fri 10/9/09
26	SEDIMENT EXCAVATION AND DISPOSAL	90 days	Mon 6/1/09	Fri 10/2/09
27	FISH LADDER DEMOLITION & CONSTRUCTION	95 days	Mon 6/1/09	Fri 10/9/09
28	DEMOBILIZATION	30 days	Mon 10/12/09	Fri 11/20/09
29	**PHASE 2 - SEDIMENT REMOVAL (SEASON 3)**	**196 days**	**Mon 3/1/10**	**Mon 11/29/10**
30	MOBILIZATION	30 days	Mon 3/1/10	Fri 4/9/10
31	RE-INSTALL DEWATERING SYSTEM/COFFERDAMS	15 days	Tue 5/11/10	Mon 5/31/10
32	DEWATERING & CARE OF WATER	100 days	Tue 6/1/10	Mon 10/18/10
33	RIVER RESTORATION	100 days	Mon 5/17/10	Fri 10/1/10
34	SEDIMENT EXCAVATION AND DISPOSAL	60 days	Tue 6/1/10	Mon 8/23/10
35	DAM NOTCHING & CONCRETE REMOVAL OPERATIONS	60 days	Tue 6/1/10	Mon 8/23/10
36	SPILLWAY WEIR CONSTRUCTION	40 days	Wed 8/4/10	Tue 9/28/10
37	SLUICEWAY / GATE INSTALLATION	20 days	Tue 8/24/10	Mon 9/20/10
38	CONVEYOR SYSTEM REMOVAL	20 days	Tue 8/24/10	Mon 9/20/10
39	RESTORE RESERVOIR ACCESS ROAD	30 days	Tue 9/21/10	Mon 11/1/10
40	DEMOBILIZATION	30 days	Tue 10/19/10	Mon 11/29/10



Project: SAN CLEMENTE DAM NOTCHING
Date: Mon 12/10/07

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary | External Milestone | Deadline

Construction would occur in two distinct phases. Phase 1, in CY 3, would include mobilization, construction of the new access road to the CVFP, OCRD bridge improvements, road aggregate delivery, improvements to existing access roads (high road, low road, plunge pool access road, and pipeline access road), improvement of the access road from Cachagua Grade to the sediment disposal site, and construction of a new access road from the sediment disposal site to the reservoir. The sediment disposal site would be cleared of vegetation and prepared for delivery of the conveyors and radial stackers. After the new road is completed, the supports for the conveyor would be installed and eventually the conveyor sections would be fastened to the supports. First year work may also possibly include construction of some of the stream diversion features and would conclude with demobilization for the winter. In addition, a new water diversion facility would be constructed to replace CAW's existing water diversion at the Dam.

Phase 2 (CY 4, 5 and 6) would include the construction of temporary roads across the reservoir sediment surface to allow access of excavating equipment, the removal of sediment, the notching of the Dam, construction of the new fish ladder, construction of the new river intake and conveyance pipeline extension, the reconstruction of stream channels, and the restoration and revegetation of the sediment pile and reservoir area. It would include seasonal mobilization, stream diversion and reservoir dewatering, and interim stabilization of the sediment pile the first winter.

The majority of the work in Phase 1 is planned to take approximately 10 months between March and December of year three. Phase 2 is planned to take three years. During CY 4, 5 and 6, mobilization would occur during the month of March. Fieldwork in the reservoir area would start early May . Installation of diversion and dewatering facilities would take about one month, with closure of the cofferdams on or about May 31. Fish rescue would continue until June 30. Drawdown of the reservoir would continue until about October. Actual sediment removal operations would take place during a five-month period from June through October. Removal of cofferdams and demobilization of in-stream construction operations would occur October to the end of November. Allowing for holidays and a few days of bad weather, it was assumed that each season would have approximately 100 working days of actual sediment-removal production operations.

Sediment excavation, transport and placement operations would be conducted in two 10-hour shifts, five days per week. The equipment for sediment excavation and transport can sustain an average rate of 500 cubic yards per hour with a peak capacity of 700 cubic yards per hour. The estimated sediment removal rate is about 900,000 cubic yards per season. Two seasons would be required for sediment removal for the Dam notching alternative.

During the last year of sediment removal operations, sediment removal would be completed in August. The Dam notching activities would begin around June of year 6, concurrently with the sediment removal operations, Notching and sediment removal

would be completed August of CY 6. Fish ladder construction would take place during a five-month period from June to October of CY 5. Spillway overflow weir construction would occur August to September of CY 6. Approximately 1,500 cubic yards of concrete would be procured from an off-site commercial concrete plant and would be transported to the site by ready-mix trucks. Concrete placement operations may require an average of four or five concrete truckloads per day. Placement of concrete would be completed in mid November prior to commencement of the rainy season. Removal of cofferdams and demobilization of in-stream construction operations would occur later in November.

Reservoir restoration and channel reconstruction activities would take place concurrently with sediment removal activities. This work would begin at the upstream end of the reservoir and progress downstream as new areas of the historical stream terraces and channel are uncovered. Additional time would be needed at the conclusion of the sediment removal, dam notching, and cofferdam removal operations to complete the reconstruction of the newly exposed portions of the river channel and the revegetation of the old reservoir and sediment inundation areas.

Construction Crews

The requirements for labor, which affects the number of vehicle trips to and from the site, vary from an approximate average of 20 workers per day during Phase I (road construction and improvements scheduled for one season for approximately eight months), to an approximate average of 45 workers per day during Phase II (sediment excavation and disposal, dam modification, and fish ladder construction). A maximum of about 60 workers would be needed during the third year, when sediment excavation and removal would be completed at the same time that dam notching and form erection and concrete placement occur for the fish ladder. Construction crews could be transported to work in car pools to minimize construction-related traffic.

3.4 ALTERNATIVE 2: DAM REMOVAL

3.4.1 OVERVIEW

This alternative would remove SCD to prevent failure from an MCE and a PMF, as described in Section 3.2. Approximately 2.5 million cubic yards (1,555 AF) of accumulated sediment would be removed from behind the Dam over three seasons by excavation with heavy earthmoving equipment. A conveyor belt system would be used to transport the sediment to a disposal area east of the reservoir. the Dam would be demolished and removed from the site. The fish ladder will be demolished and removed.

During the active construction seasons, the Carmel River and San Clemente Creek would be diverted around the reservoir and dam site, and the reservoir would be dewatered. CAW's new diversion intake would be installed upstream to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply. During construction, the intake would divert through a separate temporary bypass line around the construction site into CAW's existing system. The permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process. A notch would be cut into OCRD, which is about 1800 feet downstream of SCD, in order to provide adequate fish passage. The river channel exposed through removal of sediment in the historic reservoir inundation zone would be reconstructed.

This project is expected to take seven years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, dam demolition, and channel reconstruction. Actual site work, from mobilization to demobilization, would require about five years. The effects of annual precipitation on river flow conditions could affect the schedule in the spring. Construction activities necessary to complete the project are summarized below. Improvements to and/or new roads as part of the proposed project are also conceptually described.

3.4.2 PROJECT LOCATION & ACCESS

The project study area, area of potential effect, facilities, and land ownership are described in Section 3.2. Figures 3.2-1 and 3.2-2 depict the project region and vicinity, respectively.

3.4.3 EXISTING STRUCTURE & OPERATIONS

SCD and reservoir, associated facilities, dam and reservoir operations, the CVFP, the existing fish ladder, and current provisions for fish passage are described in Section 3.2.

3.4.4 PROJECT CHARACTERISTICS

This section describes the SCD removal alternative, including demolition and removal; sediment excavation, transport and disposal; access roads; and stream diversion and reservoir drawdown and dewatering. It also summarizes construction activities necessary to complete the project.

Dam Removal

Dam removal would not proceed until sediment removal is complete (see discussion below). At the conclusion of the sediment removal process, SCD would be demolished using explosives. This involves the demolition and removal of about 7,000 to 8,000 cubic yards of concrete from the site. The concrete debris would be further broken up into pieces of sizes that could be loaded and transported by off-highway trucks to the sediment disposal pile for use in erosion control.

The plunge pool downstream of the Dam would be completely drained prior to dam demolition to allow access for construction workers and machinery for demolition operations. To keep the plunge pool staging area dry during demolition, two cofferdams would be installed as described in Section 3.2.

A truck-mounted crane may be used to drill the holes into the Dam and load the explosives. The crane could be located downstream of the Dam in the drained plunge pool to provide adequate access to the entire footprint of the Dam, from the crest down to the foundation. The crane would also be used to lift out the concrete debris. Large excavators equipped with hydraulic hammers or shears would be used to reduce the size of the concrete debris as needed. Light blasting would also be used to break up the largest concrete pieces into smaller, more manageable pieces.

The existing fish ladder on the left (west) abutment of the Dam will be demolished and removed. The instrument hut near the left abutment also would be removed. the Dam-tender dwelling would be preserved and possibly converted to other uses.

Modification of CAW Water Diversion Point

Section 3.3 describes current CAW infrastructure and operations requirements for a point of diversion that will provide the required hydraulic head to drive the water through the existing filters to the clearwell for distribution. A subsurface screened intake at the head of San Clemente Reservoir was tentatively selected as the new water diversion point for the Dam removal alternative. This option is described in Section 3.3. The approximate location of the new screened intake and anticipated alignment of the pipeline extension are shown on Figure 3.3-3.

Electrical System

The existing electrical service and proposed modifications required to meet power requirements for this alternative (primarily for the conveyor system) are described in Section 3.3.

Sediment Excavation, Transport & Disposal

San Clemente Reservoir has been estimated to contain approximately 2.5 million cubic yards of sediment (MEI 2003). The characteristics of this sediment are described above, in Section 3.3. To mitigate risks for sediment accumulation and flooding in downstream reaches of the river, removal of the Dam requires the prior removal of the sediment accumulated in the reservoir since the Dam was placed in service in 1921 (note that during dam construction the streambed was excavated to about 20 feet below its original level at the Dam). As a result of the sediment removal efforts, the Carmel River and San Clemente Creek stream channels would be exposed and require reconstruction.

Several excavation methods (mechanical excavation and hydraulic dredging) are considered feasible (see Appendix G for more detail). Mechanical excavation and transport by conveyor appear to have a slight cost advantage, are simpler, and would have lesser environmental impacts than other methods. The selected approach is described in more detail below.

Sediment Excavation

The mechanical excavation of sediment would be conducted using the methods described in Section 3.3. During the first sediment removal season, the sediment would be excavated from a starting elevation ranging between 525 to 545 feet to an elevation of 505 to 525 feet. During the second season, excavation would reach a target elevation of approximately 480 to 500 feet. During the third construction season, the remaining sediment would be removed to approximately the depth of the original streambed that existed in 1921.

Pre-drainage of sediments prior to excavation would likely become ineffective in the silt deposits that exist below about elevation 485 feet within 600 to 900 feet of the Dam (see Figures 3.5a and 3.5.b in MEI 2003). These materials would not be reached until the last sediment excavation season. They would be mucked out using large excavators, draglines, or clamshells working from firm ground. The excavated materials would be placed in a drying/staging area in the immediate vicinity of the point of excavation, from where they would be excavated again and transported to the central stockpile area and conveyor loading facility.

Sediment Transport

The excavated sediment would be transported to a central stockpile in the reservoir near the mouth of the ravine where Site 4R is located. Section 3.3 describes the conveyor belt system proposed for use.

Sediment Disposal

A plan of Site 4R and a capacity curve for the site are shown in Figure 3.3-4. The maximum capacity of the site is undetermined but is well in excess of the estimated required volume of 2.5 million cubic yards. The footprint area of the sediment pile would be approximately 23 acres. The watershed area tributary to the sediment pile site is approximately 252 acres.

Site preparation prior to sediment disposal, disposal site operations and maintenance, and site restoration would all be the same as described in Section 3.3.

Stream Diversion and Reservoir Drawdown and Dewatering

Both the Carmel River and the San Clemente Creek would be diverted around the active areas of sediment excavation during the construction season. The approach to diversion, reservoir drawdown and dewatering is the same as described in Section 3.3.

3.4.5 PROJECT ACCESS AND IMPROVEMENTS

Road access to the sediment disposal site and San Clemente Reservoir would be established via Cachagua Grade. An existing jeep trail that extends between a gated entrance off Cachagua Grade and the sediment disposal site would be improved, and a conveyor belt system and maintenance road would be installed between the reservoir and the sediment disposal site. Road realignment and improvements are discussed in more detail below.

Access from Carmel Valley Road to San Clemente Dam

Existing vehicle access to SCD and the filter plant from Carmel Valley Road is described in Section 3.2. Improvements to these existing access roads are also described in Section 3.2.

Minor improvements may be made to the “High Road” (crossing a ford over the Carmel River) or “Low Road” (using an existing bridge across the river at the OCRD). These roads may require localized grading and/or widening, cut or fill slope stabilization, and vegetation removal. However, no major improvements are contemplated since the primary access to the reservoir will be via Cachagua Grade as described below.

At the OCRD, an existing unimproved single lane road follows the southeast side of the Carmel River to the plunge pool at the base of the Dam. This road has been in limited use and had a number of washouts from the 1995 and 1998 floods. This plunge pool access road would be improved to place the downstream cofferdams and stage the crane and other construction equipment used in demolition operations at the base of the Dam. Some tree pruning and removal would be needed. The roadbed would be filled with sand and gravel and topped with crushed rock to provide one lane, two-way access and designated pullouts. An asphaltic sealant coat would be applied to the crushed rock to stabilize it and prevent it from moving into the river.

Access to Sediment Disposal Site and Reservoir

The primary access used to develop the sediment disposal site and access the reservoir would be via Carmel Valley Road and Cachagua Grade. This access and proposed improvements to it are described in Section 3.3.

3.4.6 PARTIAL RECONSTRUCTION OF THE RIVER CHANNEL AND REVEGETATION OF THE VALLEY FLOOR

Removal of the reservoir sediment would expose the pre-1921 alluvial deposits in the river channel and floodplain through the historic reservoir inundation zone. A three-stage channel would be provided through selective contouring along both the Carmel River and San Clemente Creek. The channel would be similar to but longer than the one described in Section 3.3.

3.4.7 CONSTRUCTION SCHEDULE AND OPERATIONS

A conceptual schedule is presented in Figure 3.4-1 Project Schedule. Following the State Notice of Determination and Federal Record of Decision, final engineering studies would begin in CY 2. These include geotechnical investigations for the sediment site and access roads; design of the access roads and conveyor system; design of the sediment pile including stability and hydrologic analyses; design of the new water intake and conveyance pipeline extension; planning for demolition of the Dam; planning and design of stream bypass and dewatering facilities; design of the reconstruction of the Carmel River and San Clemente Creek channels; and design of mitigation or habitat enhancement plans for CRLF and steelhead. A construction contract package is planned to be developed and construction bids solicited late in CY 1, for award early in CY 2.

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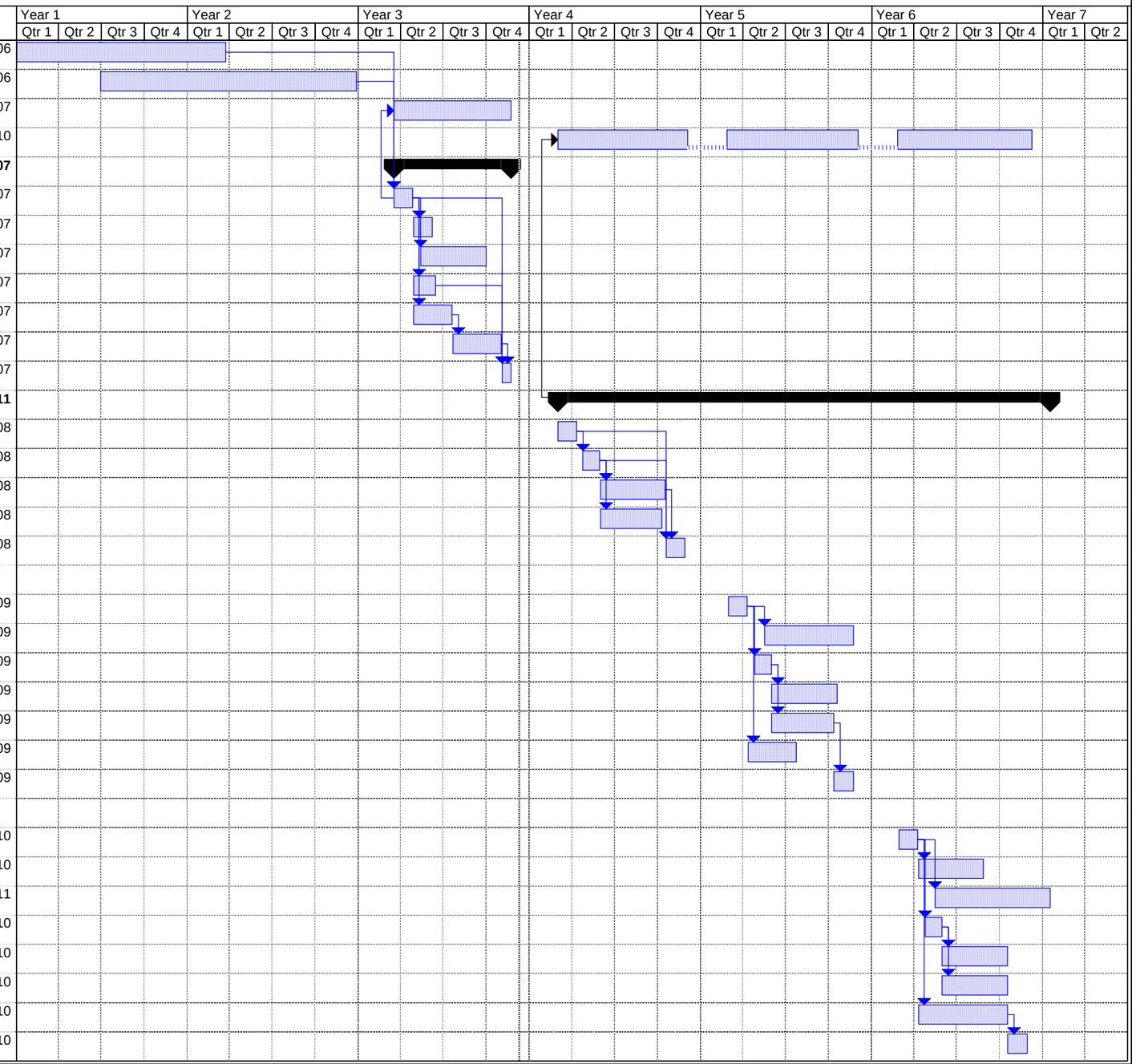
Figure 3.4-1 SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT
ALTERNATIVE 2- DAM REMOVAL
CONCEPTUAL SCHEDULE

ID	Task Name	Duration	Start	Finish
1	PERMITTING	320 days	Mon 1/3/05	Fri 3/24/06
2	ENGINEERING DESIGN	390 days	Fri 7/1/05	Thu 12/28/06
3	SH &CRLF MIT MONTORING PHASE 1	180 days	Mon 3/19/07	Fri 11/23/07
4	SH &CRLF MIT MONTORING PHASE 2	604 days	Mon 3/3/08	Thu 12/9/10
5	**PHASE 1**	**180 days**	**Mon 3/19/07**	**Fri 11/23/07**
6	MOBILIZATION	30 days	Mon 3/19/07	Fri 4/27/07
7	SET-UP STREAM DIVERSION	30 days	Mon 4/30/07	Fri 6/8/07
8	INSTALL CAL-AM'S WATER DIVERSION INTAKE AND PIPELINE	100 days	Tue 5/15/07	Mon 10/1/07
9	ACCESS ROAD UPGRADE	35 days	Mon 4/30/07	Fri 6/15/07
10	RESERVOIR/CONVEYOR ACCESS ROAD	60 days	Mon 4/30/07	Fri 7/20/07
11	CONVEYOR FOUNDATIONS AND SECTIONS	75 days	Mon 7/23/07	Fri 11/2/07
12	DEMOBILIZATION	15 days	Mon 11/5/07	Fri 11/23/07
13	**PHASE 2**	**751 days**	**Mon 3/3/08**	**Mon 1/17/11**
14	MOBILIZATION	30 days	Mon 3/3/08	Fri 4/11/08
15	INSTALL DEWATERING SYSTEM	26 days	Fri 4/25/08	Fri 5/30/08
16	DEWATERING & CARE OF WATER	100 days	Mon 6/2/08	Fri 10/17/08
17	SEDIMENT EXCAVATION AND DISPOSAL	95 days	Mon 6/2/08	Fri 10/10/08
18	DEMOBILIZATION	30 days	Mon 10/20/08	Fri 11/28/08
19				
20	MOBILIZATION	30 days	Mon 3/2/09	Fri 4/10/09
21	RIVER RESTORATION	136 days	Mon 5/18/09	Mon 11/23/09
22	INSTALL DEWATERING SYSTEM	26 days	Mon 4/27/09	Mon 6/1/09
23	DEWATERING & CARE OF WATER	100 days	Tue 6/2/09	Mon 10/19/09
24	SEDIMENT EXCAVATION AND DISPOSAL	95 days	Tue 6/2/09	Mon 10/12/09
25	DRILL DAM ABOVE EL. 525	75 days	Mon 4/13/09	Fri 7/24/09
26	DEMOBILIZATION	30 days	Tue 10/13/09	Mon 11/23/09
27				
28	MOBILIZATION	30 days	Mon 3/1/10	Fri 4/9/10
29	INSTALL CAL-AM'S PERMANENT WATER DIVERSION PIPELINE	100 days	Mon 4/12/10	Fri 8/27/10
30	RIVER RESTORATION	176 days	Mon 5/17/10	Mon 1/17/11
31	INSTALL DEWATERING SYSTEM	26 days	Mon 4/26/10	Mon 5/31/10
32	DEWATERING & CARE OF WATER	100 days	Tue 6/1/10	Mon 10/18/10
33	SEDIMENT EXCAVATION AND DISPOSAL	100 days	Tue 6/1/10	Mon 10/18/10
34	DAM DRILLING & DEMOLITION	136 days	Mon 4/12/10	Mon 10/18/10
35	DEMOBILIZATION	30 days	Tue 10/19/10	Mon 11/29/10



Project: SAN CLEMENTE DAM REMOVAL
Date: Mon 12/10/07

Task | Milestone | Rolled Up Split | External Tasks | Deadline
Split | Summary | Rolled Up Milestone | Project Summary
Progress | Rolled Up Task | Rolled Up Progress | External Milestone

Construction would occur in two distinct phases. Phase 1, in CY 3, would include mobilization, improvement of the access road from Cachagua Grade to the sediment disposal site, and construction of a new access road from the sediment disposal site to the reservoir. The sediment disposal site would be cleared of vegetation and prepared for delivery of the conveyors and radial stackers. After the new road is completed, the supports for the conveyor would be installed and eventually the conveyor sections would be fastened to the supports. Phase 1 work may also possibly include construction of some of the stream diversion features and would conclude with demobilization for the winter. In addition, a new water diversion facility would be constructed to replace CAW's existing diversion facility at the Dam. Phase 2, in CY 4, 5 6, and January of CY 7 would include the construction of temporary roads across the reservoir sediment surface to allow access of excavating equipment, removal of sediment, demolition of the Dam; reconstruction of stream channels, and restoration and revegetation of the sediment pile and reservoir area. It would include seasonal mobilization, stream diversion and reservoir dewatering, and interim stabilization of the sediment pile the first winter. The permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process.

The majority of the work in Phase 1 is planned to take approximately nine months between March and November of CY 3. Phase 2 is planned to take three years and one month. During each of these years, mobilization would occur during the month of March. Fieldwork in the reservoir area would start approximately around May. Installation of diversion and dewatering facilities would take about one month, with closure of the cofferdams on or about May 31. Fish rescue would continue until June 30. Drawdown of the reservoir would continue until about October Actual sediment removal operations would take place during a five-month period from June through October. Removal of cofferdams and demobilization of in-stream construction operations would occur in November. Allowing for holidays and a few days of bad weather, it was assumed that each season would have approximately 100 working days of actual sediment-removal production operations.

Sediment excavation, transport and placement operations would be conducted in two 10-hour shifts, five days per week. The equipment for sediment excavation and transport can sustain an average rate of 500 cubic yards per hour with a peak capacity of 700 cubic yards per hour. The estimated sediment removal rate is about 900,000 cubic yards per season. Three seasons would be required for sediment removal for the Dam removal alternative.

During the last year of sediment removal operations, sediment removal would be completed in October. The upper portion of the Dam would be demolished while sediment removal is being completed, and dam demolition and removal activities would continue into the fall and be completed in October. Removal of cofferdams and demobilization of in-stream construction operations would occur from October to the end of November.

Reservoir restoration and channel reconstruction activities would take place concurrently with sediment removal activities. This work would begin at the upstream end of the reservoir and progress downstream as new areas of the historical stream terraces and channel are uncovered. Additional time would be needed at the conclusion of the sediment removal, dam demolition, and cofferdam removal operations to complete the reconstruction of the newly exposed portions of the river channel and the revegetation of the old reservoir and sediment inundation areas.

Construction Crews

The requirements for labor, which affects the number of vehicle trips to and from the site, vary from an approximate average of 15 workers per day during Phase I (road construction and improvements scheduled for one season for approximately eight months), to an approximate average of 40 workers per day during Phase II (sediment excavation and disposal). A maximum of about 60 workers would be needed during July through October. Construction crews could be transported to work in car pools to minimize construction-related traffic.

3.5 ALTERNATIVE 3: CARMEL RIVER REROUTE & DAM REMOVAL

3.5.1 OVERVIEW

This alternative would remove SCD to prevent failure from a MCE and a PMF, as described in Section 3.2. Approximately 380,000 cubic yards (235 AF) of accumulated sediment behind the Dam on the San Clemente Creek arm of the reservoir would be relocated to the Carmel River arm, where the bulk of accumulated sediment already has been deposited. A portion of the Carmel River would be permanently bypassed by cutting a 450-foot-long channel between the Carmel River and San Clemente Creek, approximately 2500 feet upstream of the Dam. The bypassed portion of the Carmel River would be used as a sediment disposal site for the accumulated sediment. The spoils from channel construction (235,000 cubic yards or 145 AF) would be used for construction of a diversion dike at the upstream end of the bypassed reservoir arm. The Dam and fish ladder would be demolished and removed from the site.

During the active construction seasons, the Carmel River and San Clemente Creek would be diverted around the reservoir and dam site, and the reservoir would be dewatered. CAW's new diversion intake would be installed upstream to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply during construction. The intake would divert through a separate temporary bypass line around the construction site into CAW's existing system. Accumulated sediment would be removed from behind the Dam over one season by excavation with heavy earthmoving equipment. The equipment would transport the sediment to a disposal area in the bypassed portion of the reservoir. The sediments at the downstream end of the bypassed reservoir arm would be stabilized and protected from erosion. The San Clemente Creek channel would be reconstructed through its historic inundation zone from the exit of the diversion channel to the dam site. The permanent transmission line to connect the new diversion intake to the existing transmission line to CVFP would be installed at an appropriate point in the construction process.

A notch would be cut into OCRD, which is about 1800 feet downstream of SCD, in order to provide adequate fish passage.

This project is expected to take five years to complete, including environmental review, permitting, design, infrastructure improvements, sediment removal, bypass channel excavation, diversion dike construction, dam demolition, and creek channel reconstruction. The effects of annual precipitation on river flow conditions could affect the schedule in the spring. Construction activities necessary to complete the project are summarized below. Improvements to and/or new roads proposed as part of the project are also conceptually described.

3.5.2 PROJECT LOCATION & ACCESS

The project study area, area of potential effect, facilities, and land ownership are described in Section 3.2. Figures 3.2-1 and 3.2-2 depict the project region and vicinity,

respectively. An overview of the site is shown on Figure 3.5-1, and a detailed site plan is shown on Figure 3.5-2.

3.5.3 EXISTING STRUCTURE & OPERATIONS

SCD and reservoir, associated facilities, dam and reservoir operations, the CVFP, the existing fish ladder, and current provisions for fish passage are described in Section 3.2.

3.5.4 PROJECT CHARACTERISTICS

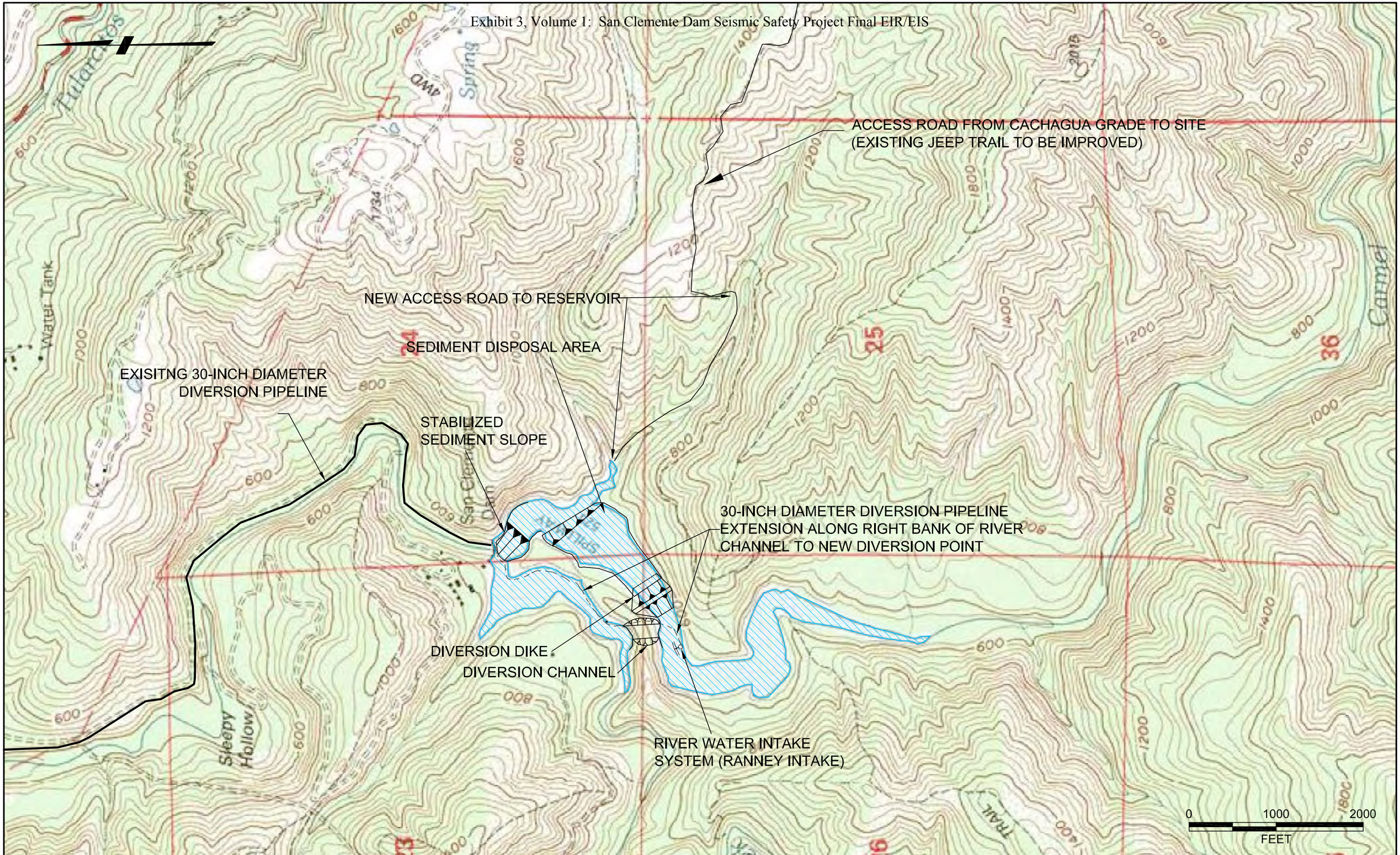
This section describes the Carmel River reroute and dam removal project, including demolition and removal; sediment excavation and relocation; access roads; stream channel restoration; and stream diversion and reservoir drawdown and dewatering. It also summarizes construction activities necessary to complete the project.

Dam Removal

Dam removal would not proceed until sediment in the San Clemente Creek arm is relocated to the Carmel River arm. At the conclusion of the sediment removal process, SCD and existing fish ladder would be demolished in the same manner as described for alternative 2 (Section 3.4).

Modification of CAW Water Diversion Point

Section 3.3 describes current CAW infrastructure and operations requirements for a point of diversion that will provide the required hydraulic head to drive the water through the existing filters to the clearwell for distribution. A subsurface screened intake at the head of San Clemente Reservoir was tentatively selected as the new water diversion point for the Dam removal alternative. This option is described in Section 3.3. The approximate location of the new screened intake and anticipated alignment of the pipeline extension are shown on Figure 3.3-3. The permanent diversion intake and temporary water diversion pipeline would be installed to replace the existing intake at the Dam to avoid interruption of this source of CAW's water supply while the project is under construction. The permanent pipeline will be installed at an appropriate point in the construction process.



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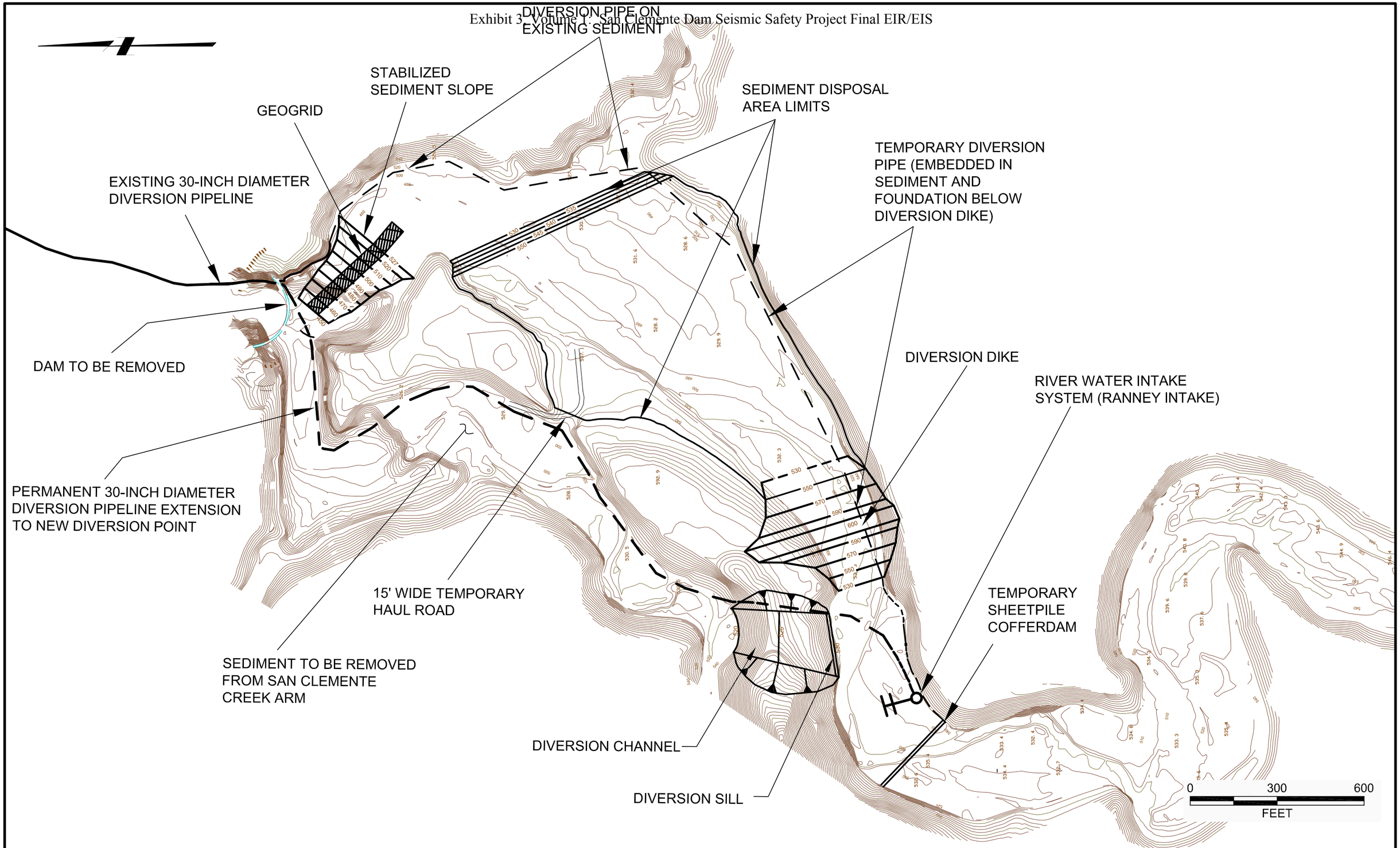
CALIFORNIA AMERICAN WATER

SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
CARMEL RIVER BYPASS SITE PLAN

Figure 3.5-1



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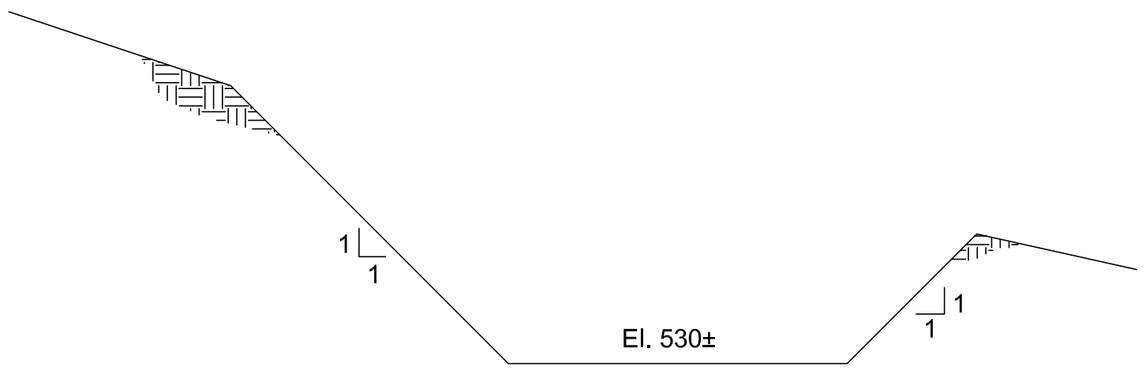
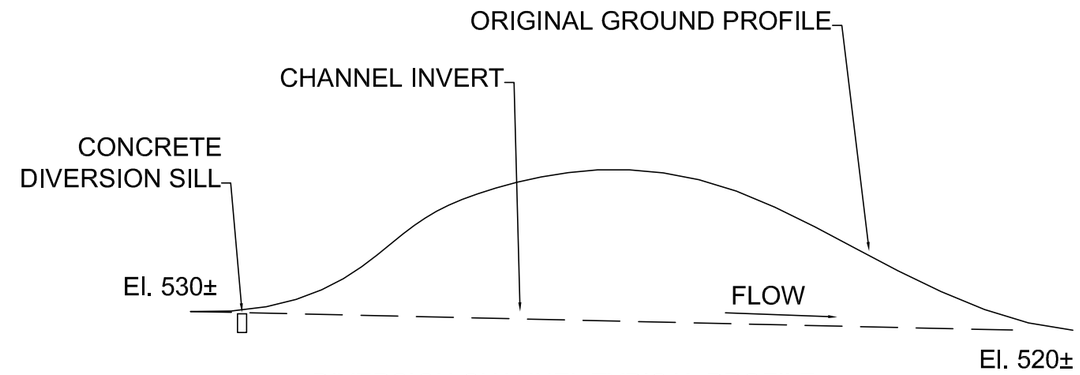
SAN CLEMENTE DAM
SEISMIC SAFETY EIR/EIS PROJECT
DETAILED CARMEL RIVER BYPASS SITE PLAN

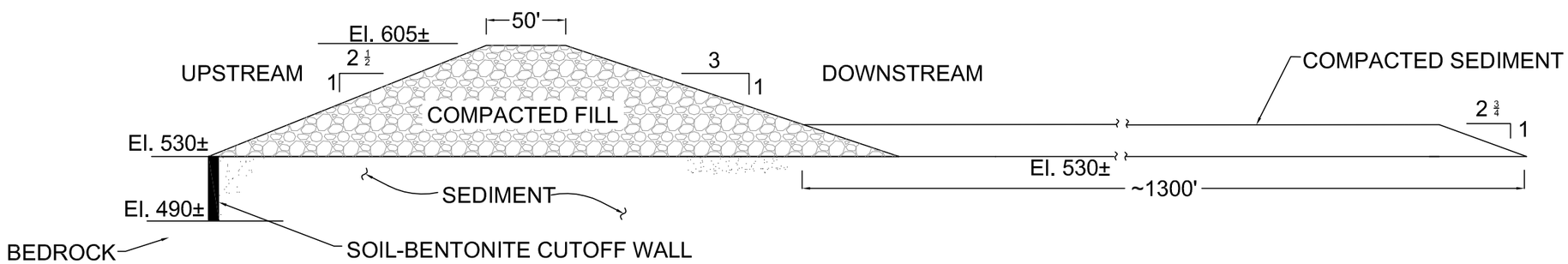
FIGURE #



DIVERSION CHANNEL TYPICAL CROSS-SECTION
(LOW-FLOW THALWEG & INSTREAM FEATURES NOT SHOWN)



DIVERSION CHANNEL TYPICAL PROFILE



DIVERSION DIKE AND SEDIMENT PILE TYPICAL CROSS-SECTION

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SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
CHANNEL, DIKE, & DISPOSAL SITE CROSS SECTIONS

FIGURE 3

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Electrical System

The existing electrical service is described in Section 3.3. Construction power requirements would be limited for the bypass construction and dam removal because the sediment and dam removal operations would be primarily performed with diesel-powered equipment. However, it is anticipated that sediment removal would include smaller loads due to factors such as dewatering requirements, construction office trailers, equipment maintenance shop, and night lighting. Based on preliminary discussions with PG&E, the configuration of the existing PG&E 60-kV and 12-kV power lines would be able to handle the construction load and supply the needed power through temporary 12-kV extensions from the left abutment. Several substations (transformers, breakers, motor starters, controls, etc.) would be installed along the extended line to power lighting, dewatering pumps, etc. The feasibility of this alternative approach would need to be confirmed during design by PG&E by conducting the appropriate utility load studies, protection studies, short circuit studies, and coordination studies. Associated changes that the utility might require as a result of these studies would need to be implemented.

Sediment Excavation & Relocation

San Clemente Reservoir has been estimated to contain approximately 2.5 million cubic yards (1,550 AF) of sediment (MEI 2003). The characteristics of the sediment are described above, in Section 3.3.

Sediment Disposal Site

The Carmel River Reroute and Dam Removal alternative would use the bypassed arm of the Carmel River (where the bulk of accumulated sediment has already been deposited) as a disposal site, minimizing sediment excavation quantities and transport distances. This alternative would confine all work, excluding access improvements, within the existing reservoir site boundaries. Because of the site's remoteness, sediment removal could proceed in two daily shifts without disturbing neighboring communities or sensitive receptors, thus resulting in a shorter schedule than for some of the other sites considered.

The maximum capacity of the disposal site is undetermined but is well in excess of the required excavated volume of 380,000 cubic yards estimated by MEI (MEI 2005). Thus, the bypass site has ample capacity to store all sediment. The toe of the sediment pile would be located at approximate elevation 530 feet. The top of the sediment pile would be at about elevation 550 feet in order to contain all of the sediment accumulated in the San Clemente Creek portion of the reservoir. The footprint area of the sediment pile would be approximately 13 acres. The watershed area tributary to the sediment pile site is approximately 21 acres.

Sediment Excavation, Transport, and Placement

Several excavation methods (mechanical excavation and hydraulic dredging) are considered feasible (see Appendix G for more detail). Mechanical excavation appears to have a slight cost advantage, is simpler, and would have lesser environmental impacts than other methods.

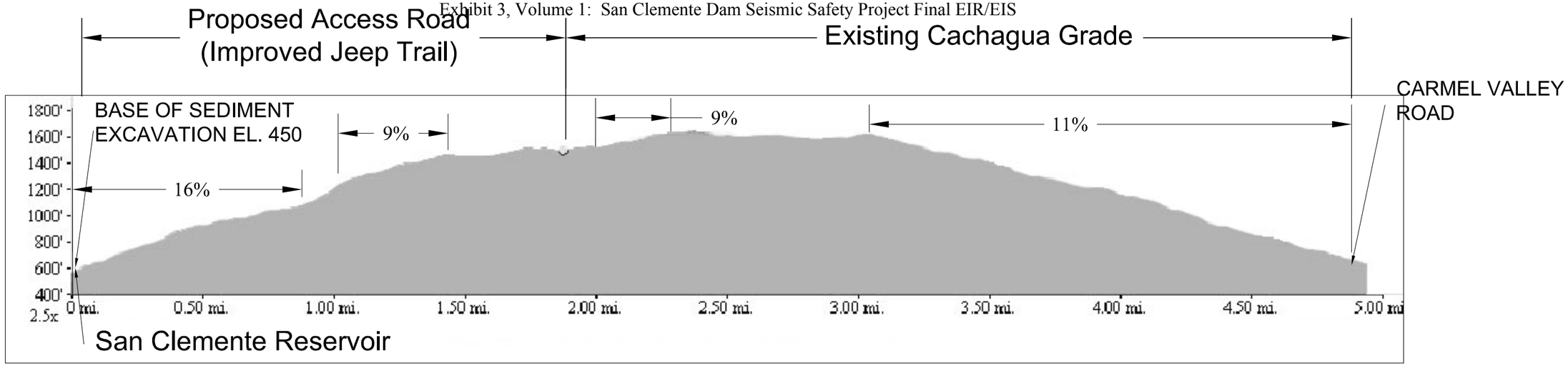
It is anticipated that the sediment would be removed in planes approximately parallel to the existing surface of the sediment in the San Clemente Creek arm of the reservoir. This approach is consistent with the preferred excavation method using scrapers. In combination with reservoir dewatering and sediment pre-draining activities described above, this method would also help maintain the excavation work above the groundwater level for as long as possible. The third year of construction will be dedicated to access improvements and temporary stream diversion features. During the fourth construction season, the sediment would be removed to approximately the depth of the original streambed that existed in 1921 (note that, at the Dam, the streambed was excavated to about 20 feet below its original level). However, it is anticipated that final sediment removal and clean up would occur during the fourth construction season prior to dam removal operations.

Excavation of sediment above the water table would be performed using self-loading scrapers or similar self-propelled excavating equipment. The scrapers would transport the material to the disposal area on the bypassed reservoir arm, where the material would be allowed to drain further, and then compacted in place. The proposed disposal site location and layout is shown on Figure 3.5-2.

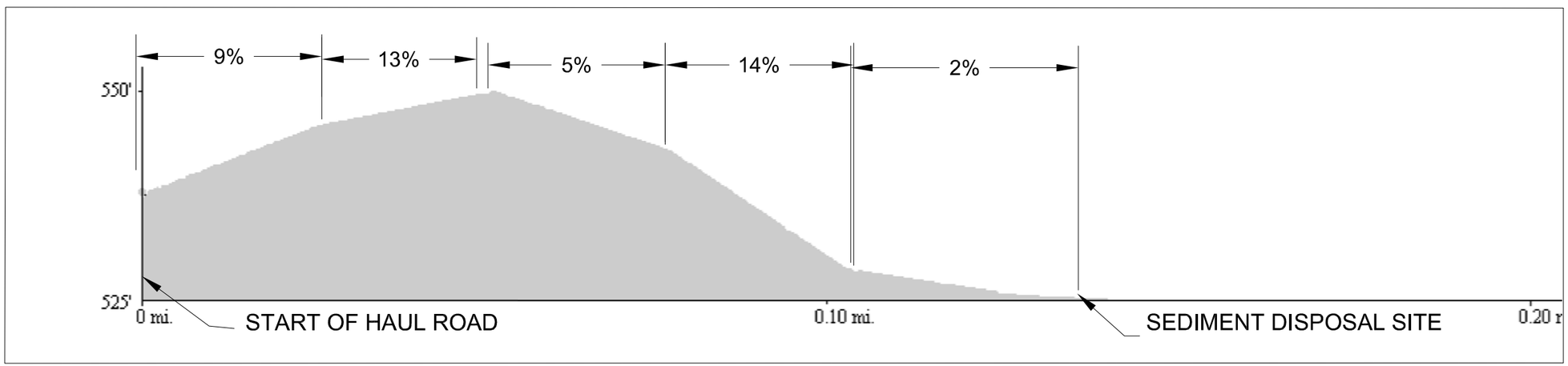
Pre-drainage of sediments prior to excavation would likely become ineffective in the silt deposits that exist below about elevation 485 feet within 600 to 900 feet of the Dam (see Figures 3.5a and 3.5.b in MEI 2003). These materials would be reached towards the end of the initial sediment excavation season. They would need to be mucked out using large hydraulic excavators, draglines, or clamshells working from firm ground. The excavated materials would be placed in a drying/staging area in the immediate vicinity of the point of excavation, from where they would be excavated again and transported to the disposal area on the bypassed reservoir arm.

Scrapers and other earthmoving equipment would transport the excavated sediment from San Clemente Creek to the bypassed Carmel River arm via a connecting road that traverses the land peninsula between the two reservoir arms. The approximate route and profile of the road is shown in Figure 3.5-4. At the disposal site, a bulldozer would be used to spread the sediment across the disposal area in preparation for compaction.

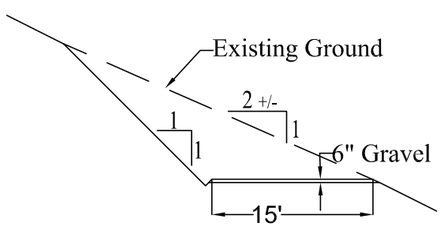
Site preparation prior to sediment disposal would include (1) the clearing and grubbing of trees and vegetation from the sediment pile footprint, (2) the removal of any existing facilities (none have been identified), and (3) the stripping and stockpiling of organic soils (minimal) for use in subsequent restoration and revegetation of the site once sediment placement has been completed.



PROFILE OF ACCESS ROAD TO RESERVOIR SITE



PROFILE OF HAUL ROAD



TYPICAL ACCESS ROAD SECTION

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SAN CLEMENTE DAM
SEISMIC RETROFIT EIR/EIS PROJECT
PROFILES OF SITE ACCESS AND HAUL ROADS

FIGURE 4

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Upon delivery of sediment to the site, the sediment would be spread by means of bulldozers into thin, nearly horizontal lifts. Each lift would be compacted using the same bulldozers or vibratory compactors. The sediment pile would be constructed with a side slope as required for stability. The side slope has been assumed to average 2-3/4 horizontal to 1 vertical for the purpose of performing site capacity calculations. Concrete debris from dam removal would be placed on selected areas of the pile to provide long-term erosion protection. Such areas include the groins along the contact between the pile and the hillside abutments. A large percentage of the concrete used to construct the Dam does not have reinforcement. However, where reinforced concrete exists in the concrete debris from demolition, it will be separated out and disposed of at an offsite facility. This is not anticipated to require extensive offsite disposal hauling during construction.

At the conclusion of each construction season, the portions of the excavation and disposal site above the maximum reservoir level (El. 525) would need to be winterized. This would involve (1) providing interim drainage and diversion of ravine flows, (2) stabilizing sloping sediment surfaces and other disturbed areas by installing erosion protection features such as erosion control mats or straw mulch and wattles, and (3) providing sediment collection features such as silt fences, straw bales, and sediment traps along the toe of the pile and other disturbed areas.

Once placement of sediment and concrete debris has been completed, the topsoil from the temporary topsoil stockpile developed during site stripping would be spread over the sediment pile. The graded surface would again be stabilized with erosion control measures as described above and would be revegetated with native plants and trees obtained from the site vicinity. A typical section for the sediment pile is shown on Figure 3.5-5, which abuts against the diversion dike on one end.

Slope Stabilization of Sediment in the Carmel River Channel

As part of the sediment excavation and disposal activities, the bypassed sediment in the Carmel River arm, roughly 100 feet upstream of the Dam, would be excavated and graded to produce a 4 horizontal to 1 vertical slope with a maximum length from crest to toe of about 330 feet. The slope would span the width of the river channel (~300 feet) with the top of slope elevation at El. 527 and the toe of slope at El. 450 at the deepest point of the river channel (Figure 3.5-5). After initial excavation of the silty “muck” soils at the base of the slope by clamshell, the 4 to 1 slope would be benched at regular intervals to allow for slope stabilization construction using large augers. The large augers would produce soil-cement columns by mixing cement with the existing soil to bedrock in a grid-like pattern along most of the slope face, starting 50 feet from the top of slope. Figure 3.5-6 shows a typical soil-cement mixing pattern and a three-dimensional isometric view of the completed columns (soil excluded for clarity). The soil-cement grid would serve the dual purpose of increasing the soil strength, thus stabilizing the slope, and raising the phreatic surface in the stabilized sediments in order to maintain the existing wetland areas immediately upstream of the slope.

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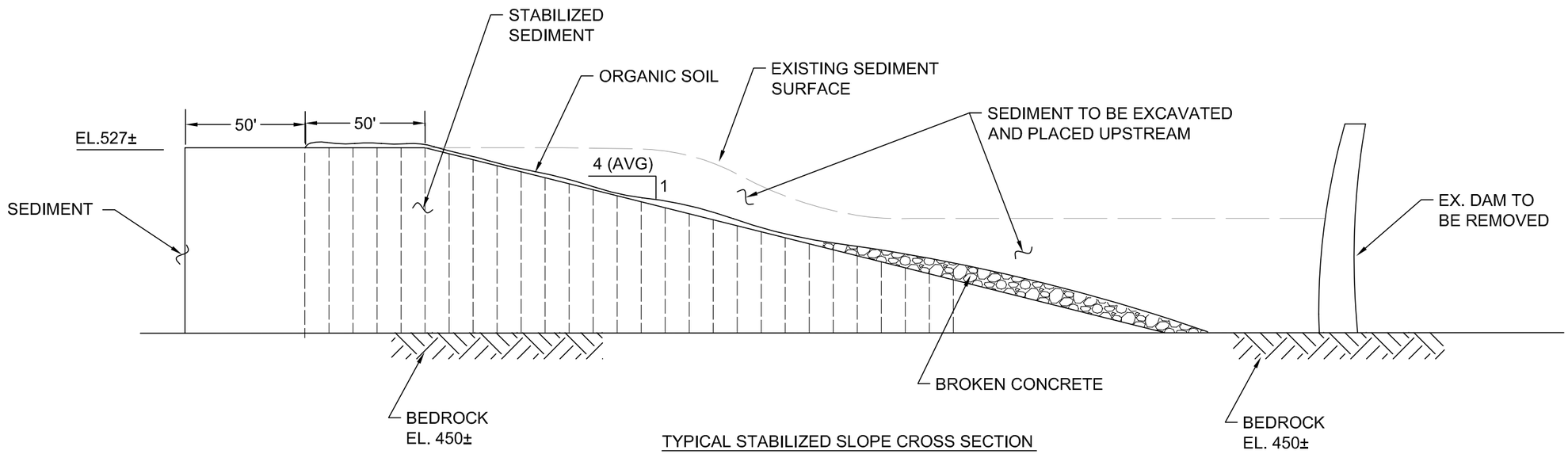
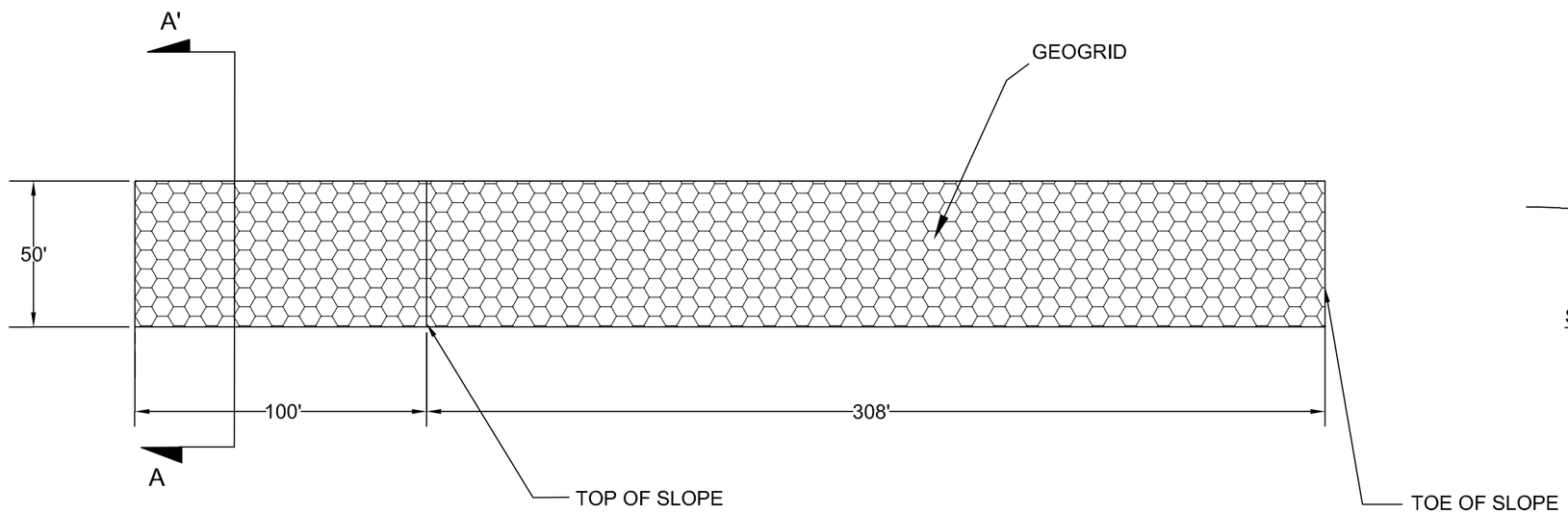
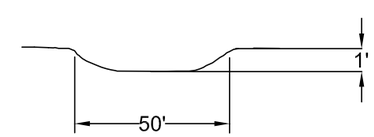


TYPICAL STABILIZED SLOPE CROSS SECTION





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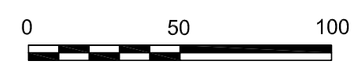
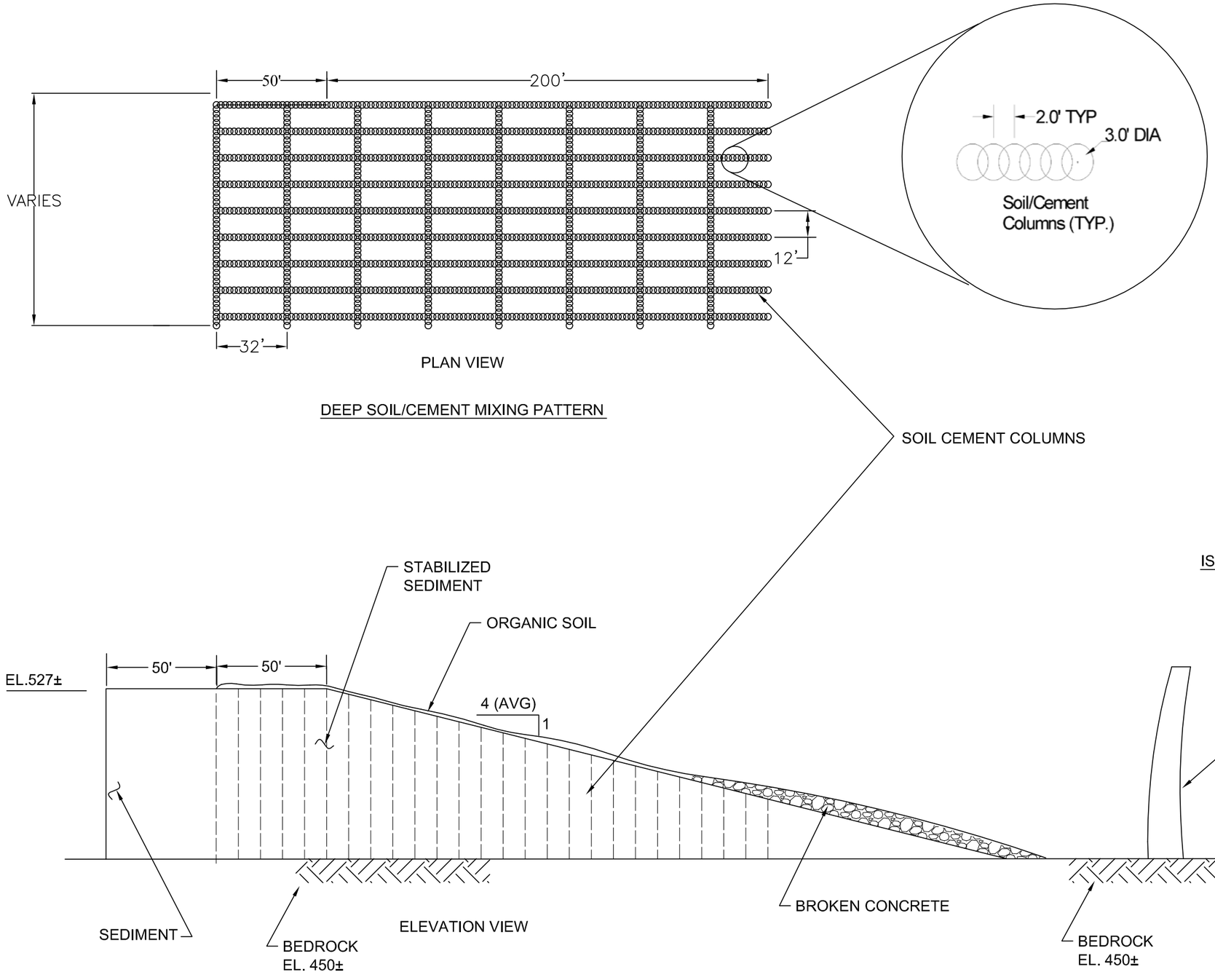
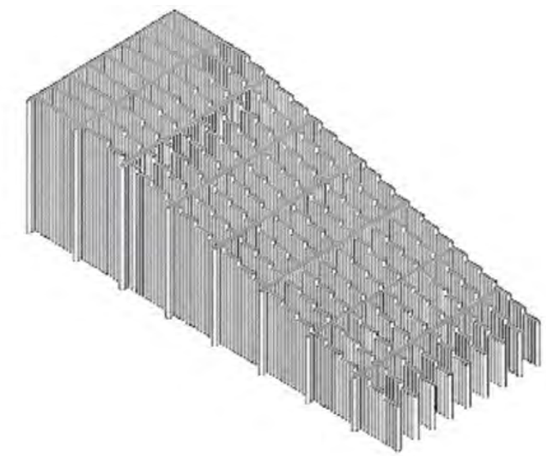


SCALE IN FEET

PLAN VIEW - GEOGRID LAYOUT ON STABILIZED SLOPE FACE

REV	DATE	BY	DESCRIPTION	SCALE		DESIGNED DRAWN CHECKED	MWH Walnut Creek California	CALIFORNIA AMERICAN WATER SAN CLEMENTE DAM SEISMIC RETROFIT EIR/EIS PROJECT STABILIZED SEDIMENT SLOPE	Figure 3.5-5





ISOMETRIC VIEW OF GROUND TREATMENT BY SOIL MIXING (NTS)
(SOIL EXCLUDED TO SHOW SOIL-CEMENT COLUMNS)

0 50 100
FEET

REV	DATE	BY	DESCRIPTION	SCALE		DESIGNED	DRAWN	CHECKED	MWH Walnut Creek California	CALIFORNIA AMERICAN WATER SAN CLEMENTE DAM SEISMIC RETROFIT EIR/EIS PROJECT SOIL–CEMENT MIXING PLAN AND ISOMETRIC VIEW	FIGURE #

After soil-cement mixing equipment demobilization, minor grading would be performed on the slope face and a geogrid would be installed on the center of slope to form a 50-foot-wide shallow channel to convey runoff from the local drainage area above the slope and minimize surface erosion. The geogrid would be placed beginning 100 feet from the top of slope, extending to the toe of slope (Figure 3.5-5). In addition, concrete debris from the demolished dam would be placed at the lower third of the slope to further stabilize the sediment and protect it against erosion from flood flows in the main river channel. Once stabilization has been completed, a 2-foot-thick layer of organic soil would be added, and the slope would be vegetated.

Stream Diversion and Reservoir Drawdown and Dewatering

Both the Carmel River and the San Clemente Creek would be diverted around the active areas of sediment excavation during the construction seasons. The approach to diversion, reservoir drawdown and dewatering are the same as described in Section 3.3.4.

Demolition and construction operations in the reservoir area will impact the diversion piping. Thus, burial or encasement of diversion piping will be necessary near the channel demolition areas, diversion dike foundation, and sediment disposal area. Figure 3.5-2 shows temporary diversion piping protection areas. In addition, during the final construction season when the Dam is demolished, diversion piping would be required to be routed over the Dam (instead of through the Dam intakes) along the right abutment. The diversion piping in the vicinity of the Dam would require protection during dam demolition operations (see Figure 3.5-2).

Exact locations of the diversion cutoff walls and pipelines, drainage trenches and well points would be field determined during detailed design. The Carmel River diversion will be upstream of the diversion channel inlet. The diversion on the San Clemente Creek reservoir branch would be placed upstream of the diversion channel outlet during each construction season. In general, diversion piping would follow along the reservoir banks.

Diversion Channel and Dike Construction

In order to permanently bypass the sediment disposal area on the Carmel River, a diversion channel must be constructed to connect Carmel River to San Clemente Creek. The location of this diversion channel is shown on Figures 3.5-1 and 3.5-2 a typical profile and section are shown on Figure 3.5-3. Blasting operations will be required to remove the large volume of rock between the two reservoir arms. Blasting operations will include:

- Clearing and grubbing of the blast area;
- An explosives magazine established onsite to store explosives;
- Pre-drilling of rock to place explosives; and

- Pre-splitting of rock at the channel boundaries to define the channel geometry.

The total blasted volume of rock is estimated at about 145 AF, or about 234,000 cubic yards (MEI 2005). Most of the blasted rock will be broken into 1-foot pieces or smaller. It is anticipated that minor operations will be required to reduce a small percentage of the blasted rock into 1-foot size and smaller with hoe-rams and similar equipment. A portion of the 1-foot and larger pieces of blasted rock will be separated for use in armoring of the diversion dike face that would be exposed to river flows.

As described in further detail below, bankfull and thalweg channels would be constructed as part of the channel excavation operations. In addition, habitat complexity would be promoted within the channel by constructing pools, runs, and riffles to provide suitable depth and velocity conditions for steelhead migration. The channel profile and section in Figure 3.5-3 show only the general geometry of the channel construction as used in the MEI hydraulic analyses (MEI 2005), which included a diversion sill at the channel upstream El. 530 and a slightly steeper slope than the natural channel (i.e., approximately 3 percent).

During and after blasting operations, blasted rock material will be pushed by bulldozers and other excavation equipment a short distance from the diversion channel area to the diversion dike foundation area for use in dike construction. The diversion dike location is shown on Figure 3.5-1. The excavated material is estimated to have 30 percent greater volume than the in-place rock, or a total of about 319,000 cubic yards. In order to contain 319,000 cubic yards of material within the existing channel geometry, the size of the diversion dike will be 75 feet high (crest at El. 605), 330 feet wide at the base, and 50 wide at the crest (see cross section on Figure 3.5-3).

Diversion dike design will include compacted rock within the geometry described above and will include a cutoff wall at the diversion dike toe (Figure 3.5-3). The 200-foot-wide by 3-foot-thick by 40-foot-deep soil-cement cutoff wall will be constructed to bedrock in order to prevent undermining and seepage of river flows below the diversion dike. As previously described, 1-foot and larger blasted rock pieces will be used to armor the diversion dike face, which will encounter river flows during the PMF up to elevation 566 (MEI 2003), or approximately 39 feet below the proposed diversion dike crest.

3.5.5 PROJECT ACCESS AND IMPROVEMENTS

Project access for this alternative would follow existing routes to the base of the Dam (with minor improvements) and the Cachagua Route to the reservoir. Road access to San Clemente Reservoir would be established via Cachagua Grade. An existing Jeep Trail that extends from Cachagua Grade site would be improved to enable the mobilization of construction equipment to the Dam site and the reservoir, and to avoid major mobilization activities through San Clemente Drive and the Sleepy Hollow community. A new access road between the Jeep Trail and the reservoir would need to be constructed. Access to the left abutment of the Dam would be by the existing San

Clemente Drive and to either the "Low Road" or "High Road" which may require minor improvements. Access to the base of the Dam would be by the existing "Low Road" and the "Plunge Pool Access Road" which would also be improved.

Access from Carmel Valley Road to San Clemente Dam

Existing vehicle access to SCD and the CVFP from Carmel Valley Road is described in Section 3.2. Improvements to these existing access roads are also described in Section 3.2.

Minor improvements may be made to the "High Road" (crossing a ford over the Carmel River) or "Low Road" (using an existing bridge across the river at the OCRD). These roads may require localized grading and/or widening, cut or fill slope stabilization, and vegetation removal. However, no major improvements are contemplated since the primary access to the reservoir will be via Cachagua Grade as described below.

Improvements to the existing unimproved single lane road from the OCRD to the plunge pool at the base of the Dam are also described in Section 3.2. This plunge pool access road would need to be improved to place the downstream cofferdams and stage the crane and other construction equipment used in demolition operations at the base of the Dam.

Access to the Reservoir

The primary access used to access the reservoir, construct the bypass, and relocate sediment from the San Clemente Creek arm to the Carmel River arm would be via Carmel Valley Road and Cachagua Grade. An existing unpaved jeep road, with entrance off Cachagua Grade approximately three miles from the intersection with Carmel Valley Road, would be used (see Section 3.3 for a description of this road and proposed traffic controls and improvements to it). The road profile is shown on Figure 3.5-4, including a new access road to the reservoir described below.

A new 0.5-mile-long access road would be constructed from the improved jeep road to the reservoir. A typical cross-section of the road is shown on Figure 3.5-4 along with a composite profile that includes Cachagua Grade. The road would be excavated along the slope of the ravine and would consist of a 15-foot-wide surface and 3-foot drainage ditch. The excavated slope above the road would be stabilized with small anchors, wire mesh and shotcrete as needed. The road surface would have 6 inches of Class II base rock installed. The road's travel surface would be sealed with a double chip seal coat. Fifteen-inch diameter or larger culverts with inlet structures would be installed at approximately 400-foot intervals for drainage.

3.5.6 RECONSTRUCTION OF THE RIVER CHANNEL AND REVEGETATION OF THE VALLEY FLOOR

As a result of the sediment removal efforts, the San Clemente Creek stream channel would be exposed and require reconstruction.

Removal of the reservoir sediment in the San Clemente Creek arm would expose the pre-1921 alluvial deposits in the river channel and floodplain through the historic reservoir inundation zone. A three-stage channel would be provided through selective contouring along San Clemente Creek. The channel is the conceptually the same as is described in Section 3.3, but will be longer and sized to convey the combined flows of San Clemente Creek and the Carmel Rivers.

3.5.7 CONSTRUCTION AND OPERATIONS

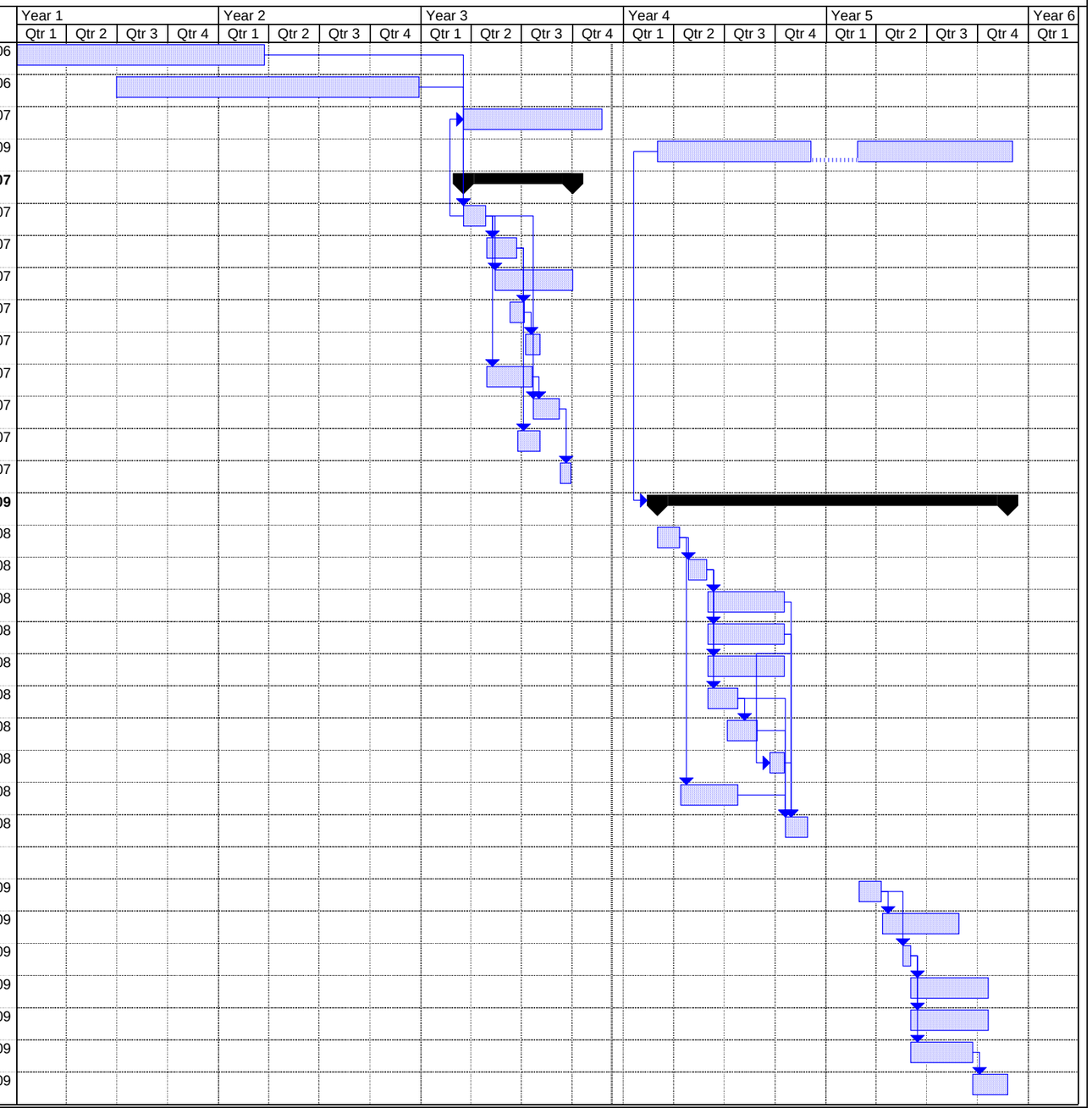
A conceptual schedule is presented in Figure 3.5-7. Following the State Notice of Determination and Federal Record of Decision, final engineering studies would begin in Year 2. These include geotechnical investigations for the sediment stabilization features and access roads; design of the access roads; design of the sediment pile including stability and hydrologic analyses; design of the new water intake and conveyance pipeline extension; planning for demolition of the Dam; planning and design of stream bypass and dewatering facilities; design of the bypass channel and diversion dike construction; design of the reconstruction of the San Clemente Creek channel; and design of mitigation or habitat enhancement plans for CRLF and steelhead. A construction contract package would be developed and construction bids solicited late in CY 1, for award early in CY 2.

Construction would occur in two distinct phases. Phase 1, in CY 3, would include mobilization, improvement of the existing access Jeep Trail from Cachagua Grade and construction of a new access road to connect the Jeep Trail to the reservoir. First year work may also include construction of a water diversion intake and temporary transmission line for CAW as well as some of the stream diversion features. It would conclude with demobilization for the winter.

Phase 2, CY 4 and 5, would include the construction of temporary roads across the reservoir sediment surface to allow access of excavating equipment, removal of sediment, blasting and construction of the bypass channel and diversion dike, sediment slope stabilization, demolition of the Dam; reconstruction of stream channels, and restoration and revegetation of the sediment pile and reservoir area. It would include seasonal mobilization, stream diversion, and reservoir dewatering, and interim stabilization of the sediment pile for the winter. The permanent water transmission line will be installed at an appropriate point in the construction process.

Figure 3.5-7 SAN CLEMENTE DAM SEISMIC SAFETY EIR/EIS PROJECT
ALTERNATIVE 3- CARMEL RIVER BYPASS & DAM REMOVAL
CONCEPTUAL SCHEDULE

ID	Task Name	Duration	Start	Finish
1	PERMITTING	320 days	Mon 1/3/05	Fri 3/24/06
2	ENGINEERING DESIGN	390 days	Fri 7/1/05	Thu 12/28/06
3	SH &CRLF MIT MONTORING PHASE 1	180 days	Mon 3/19/07	Fri 11/23/07
4	SH &CRLF MIT MONTORING PHASE 2	399 days	Mon 3/3/08	Thu 12/3/09
5	**PHASE 1**	**141 days**	**Mon 3/19/07**	**Mon 10/1/07**
6	MOBILIZATION	30 days	Mon 3/19/07	Fri 4/27/07
7	SET-UP STREAM DIVERSION	40 days	Mon 4/30/07	Fri 6/22/07
8	INSTALL CAL-AM'S WATER DIVERSION INTAKE AND TEMPORARY PIPELINE	100 days	Tue 5/15/07	Mon 10/1/07
9	CLEAR AREA FOR DIVERSION CHANNEL BLASTING	20 days	Mon 6/11/07	Fri 7/6/07
10	BUILD CUTOFF WALLS	20 days	Mon 7/9/07	Fri 8/3/07
11	CLEAR & GRUB, GRADE HAUL ROAD TO DISPOSAL AREA	60 days	Mon 4/30/07	Fri 7/20/07
12	ACCESS ROAD UPGRADE	35 days	Mon 7/23/07	Fri 9/7/07
13	PREPARE SLOPE STABLIZATION AREA	30 days	Mon 6/25/07	Fri 8/3/07
14	DEMOBILIZATION	15 days	Mon 9/10/07	Fri 9/28/07
15	**PHASE 2**	**452 days**	**Mon 3/3/08**	**Tue 11/24/09**
16	MOBILIZATION	30 days	Mon 3/3/08	Fri 4/11/08
17	INSTALL DEWATERING SYSTEM	25 days	Mon 4/28/08	Fri 5/30/08
18	DEWATERING & CARE OF WATER	100 days	Mon 6/2/08	Fri 10/17/08
19	SEDIMENT EXCAVATION AND DISPOSAL	100 days	Mon 6/2/08	Fri 10/17/08
20	SLOPE STABILIZATION OF SEDIMENT	100 days	Mon 6/2/08	Fri 10/17/08
21	BLAST BYPASS CHANNEL	40 days	Mon 6/2/08	Fri 7/25/08
22	BUILD DIVERSION DIKE	40 days	Mon 7/7/08	Fri 8/29/08
23	RIVER RESTORATION	20 days	Mon 9/22/08	Fri 10/17/08
24	DRILL DAM ABOVE EL. 525 FT	75 days	Mon 4/14/08	Fri 7/25/08
25	DEMOBILIZATION	30 days	Mon 10/20/08	Fri 11/28/08
26				
27	MOBILIZATION	30 days	Mon 3/2/09	Fri 4/10/09
28	INSTALL CAL-AM'S PERMANENT WATER DIVERSION PIPELINE	100 days	Mon 4/13/09	Fri 8/28/09
29	INSTALL DEWATERING SYSTEM	10 days	Wed 5/20/09	Tue 6/2/09
30	DEWATERING & CARE OF WATER	100 days	Wed 6/3/09	Tue 10/20/09
31	RIVER RESTORATION AND SEDIMENT EXCAVATION	100 days	Wed 6/3/09	Tue 10/20/09
32	DAM DRILLING & DEMOLITION	80 days	Wed 6/3/09	Tue 9/22/09
33	DEMOBILIZATION	45 days	Wed 9/23/09	Tue 11/24/09



Project: SAN CLEMENTE DAM REMOVAL
Date: Mon 12/10/07

Task | Milestone | Rolled Up Split | External Tasks | Deadline
Split | Summary | Rolled Up Milestone | Project Summary
Progress | Rolled Up Task | Rolled Up Progress | External Milestone

The majority of the work in Phase 1 is planned to take approximately eight months between March and October during CY 3. Phase 2 is planned to take two years. During each of these years, mobilization would occur during the month of March. Fieldwork in the reservoir area would around April. Installation of temporary stream diversion and dewatering facilities would take about one month, with closure of the cofferdams on or about May 31. Fish rescue would continue until June 30. Drawdown of the reservoir would continue until about October. Actual channel excavation, sediment stabilization and excavation, and dam removal operations would take place during a five-month period from June through October. Removal of cofferdams and demobilization of in-stream construction operations would occur in November. Allowing for holidays and a few days of bad weather, it was assumed that each season would have approximately 100 working days of actual sediment-removal production operations.

Sediment excavation, transport and placement operations would be conducted in two 10-hour shifts, five days per week. (For computation of actual production, it was assumed that each shift would have one unproductive hour, that is, the 10-hour shifts would have nine hours of actual production.) The equipment for sediment excavation and transport can sustain an average rate of 300 cubic yards per hour with a peak capacity of 500 cubic yards per hour. The estimated sediment removal rate is about 380,000 cubic yards of sediment from the San Clemente Creek channel in about three months.

During the last year of sediment removal operations, sediment removal would be completed in September. The upper portion of the Dam would be demolished while sediment removal is being completed, and dam demolition and removal activities would continue into the fall and be completed in September. Removal of cofferdams and demobilization of in-stream construction operations would occur later in November.

Reservoir restoration and channel reconstruction activities would take place concurrently with sediment removal activities. This work would begin at the upstream end of the reservoir and progress downstream as new areas of the historical stream terraces and channel are uncovered. Additional time would be needed at the conclusion of the sediment removal, dam demolition, and cofferdam removal operations to complete the reconstruction of the river channel and the revegetation of the reservoir and sediment areas.

Construction Crews

Labor requirements affecting the number of vehicle trips to and from the site vary from an approximate average of 15 workers per day during Phase I (road construction and improvements scheduled for one season for approximately eight months), to an approximate average of 25 workers per day during Phase 2 (sediment excavation and disposal). A maximum of about 40 workers would be needed during July through October. Construction crews could be transported to work in car pools to minimize construction-related traffic.

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3.6 ALTERNATIVE 4: NO PROJECT

Section 15126 of the CEQA Guidelines clarifies that the "no project" analysis must discuss the existing conditions at the time the Notice of Preparation (NOP) is published as well as what could reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. Existing conditions are discussed topically in Chapter 4 of this EIR/EIS.

NEPA regulations require each Draft EIS to include an evaluation of the no action alternative (40 Code of Federal Regulations [CFR] 1502.14c). When the proposed action is a private applicant's project, the no action alternative describes what would occur without the federal agency's approval. Although it generally does not satisfy the project's purpose and need, its inclusion in the EIS is required by NEPA as a basis for comparison. For the purposes of this EIR/EIS, the "no action" and "no project" alternatives are the same, and are referred to as the "No Project" Alternative.

Under the No Project Alternative, the reinforcement of the Dam would not occur and the Dam would remain in its present condition. The fish ladder would not be improved and the OCRD would not be notched under the No Project Alternative. The rate and timing of flow releases into the Carmel River would continue to be negotiated annually with NMFS, the CDFG and MPWMD, as long as the reservoir remained operable. Retrofit construction impacts would not occur. The reservoir would fill up with sediment and sediment would eventually flow downstream naturally. The existing access road would remain unchanged under the No Project Alternative.

In light of mandate from DSOD to render the Dam compliant with current seismic and PMF standards, it is highly unlikely that the No Project Alternative would occur. For the purpose of analysis, we are assuming that there would be no change to the current structures for the No Project Alternative. This is how the No Project Alternative was described in the September 2005 NOP. However, it is recognized that, in the absence of some measures to improve fish passage, one or more regulatory agencies could compel improvements ranging from upgrades to the existing ladder to full replacement of the ladder, measures to assure fish passage through the reservoir, as well as improved fish passage at OCRD. Impacts of such actions would be essentially the same as those described in Chapter 4 for the Proponent's Proposed Project. These actions were evaluated as part of the No Project Alternative in the Draft EIR/EIS, but have been removed from the Final EIR/EIS to allow the report to conform more closely to the intent of a No Project (No Action) alternative under NEPA and CEQA and to be consistent with the September, 2005 NOP.

The No Project Alternative would not meet the project purpose and need of increasing dam safety to meet current standards for withstanding a MCE and passing the PMF at the Dam. Interim dam safety measures would continue and seismic and flood hazard

risks would continue as described in Section 4.1. Effects on fish, as sediment fills the reservoir, are described in Section 4.4.

3.6.1 PROJECT LOCATION

See discussion in Section 3.2

3.6.2 EXISTING PROJECT FEATURES

See Section 3.2 for a description of the existing dam, access roads, fish ladder, and CVFP.

In 2003, DSOD required modifications to the Dam to meet interim dam safety requirements. Six ports were drilled through the Dam to allow seasonal drawdown of 10 feet to elevation of approximately 515 feet. The drawdown is timed to allow migratory fish passage. Each port was equipped with a trashrack to prevent large debris from entering the ports.

In 2004, a downstream fish passage system was installed to allow fish to exit the reservoir. The system consists of a borehole through the Dam (at 515 feet elevation) that connects a slide gate on the reservoir side of the Dam to a 14-inch pipe on the downstream side. The 14-inch polyvinyl chloride (PVC) pipe runs parallel to the fish ladder and discharges into the eighth pool in the ladder at an elevation of 513 feet. On the upstream side of the Dam is an adjustable weir, which provides surface spill into a box that then flows into the bypass system.

In addition, an Emergency Action Plan was developed in 2003 in coordination with the Carmel Valley Fire Department and the Monterey County Office of Emergency Services. Under this program, the Dam is monitored by an instrumentation system that automatically collects information about the Dam and river conditions, and transmits it to a Carmel Valley Emergency Operations Center and to the CAW Operations Center. Audible alarms indicate situations that require immediate attention. Instrumentation to monitor seismic activity and water levels at the reservoir, downstream plunge pool, and OCRB in addition to video surveillance were installed.

Sediment Management

This alternative would allow the reservoir to continue to fill rapidly with sediment and would allow uncontrolled spill of sediment over the Dam spillway within six to ten years. Sediment spills could result in significant downstream impacts as described in Section 4.4.

Water Diversion

Under the No Project Alternative, the existing water diversion from SCD to the existing downstream filter plant would remain unchanged. Water is diverted from the existing reservoir through the Dam's low-level outlet works to a nominal 30-inch pipeline routed

generally parallel to the low-access road (San Clemente Drive) to the CVFP downstream. The system depends upon a reservoir water elevation of 525 feet at the point of diversion to provide the required hydraulic head in the conveyance pipeline between the Dam and the downstream CVFP to drive the water through the existing filters to the clearwell for distribution. The clearwell, in turn, provides the hydraulic head for distributing the treated water into CAW's distribution system.

The maximum rate of diversion is 16 cfs, although summer diversions are not expected to exceed 3 to 4 cfs.

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