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List of Acronyms and Abbreviations

µg	micrograms
5RMK	5RMK Inc.
A	average
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACHP	Advisory Council on Historic Preservation
af	acre-feet
AGR	agricultural beneficial use
ALSP	Agricultural Lands Stewardship Plan
AMM	avoidance and minimization measure
AMMP	Adaptive Management and Monitoring Plan
AN	above normal years
AOU	American Ornithologists' Union
APA	applicant-preferred alternative
AQMP	Air Quality Mitigation Plan
ARB	California Air Resources Board
ATS	Active Treatment Systems
BA	Biological Assessment
BAAQMD	Bay Area Air Quality Management District
Basin Plan	Sacramento and San Joaquin River Basins
Bay Area	San Francisco Bay Area
Bay-Delta Plan	Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary
Bay-Delta WQCP	San Francisco Bay/Sacramento-San Joaquin Delta Estuary Water Quality Control Plan
BDCP	Bay Delta Conservation Plan
BiOps	biological opinions
BMP	best management practices
BN	below normal years
BNSF	Burlington Northern Santa Fe
BPBG	baseline plus background growth
BPBGPP	baseline plus background growth plus project
C	critical years
CAAQS	California ambient air quality standards
CALFED	California Bay-Delta Program's
CAMT	Collaborative Adaptive Management Team
CAP	Climate Action Plan
CBC	California Building Code
CCR	California Code of Regulations

CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CM	conservation measures
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
COA	Coordinated Operations Agreement
Council	Delta Stewardship Council
CPT	cone penetration testing
CSAMP	Collaborative Science and Adaptive Management Program
CSMP	Construction Site Monitoring Program
CVJV	Central Valley Joint Venture
CVP	Central Valley Project
CWA	Clean Water Act
D	dry years
D-1641	State Water Resources Control Board Water Right Decision 1641
dB	decibel
dBA	A-weighted decibels
DBPs	disinfection byproducts
DBW	California Department of Boating and Waterways
DDT	dichlorodiphenyltrichloroethane
Delta	Sacramento-San Joaquin Delta
Delta Protection Act	Johnston-Baker-Andal-Boatwright Delta Protection Act of 1992
DFW	California Department of Fish & Wildlife
DMD	Dredge Material Disposal
DO	Dissolved Oxygen
DOC	Dissolved organic carbon
DOI	U.S. Department of the Interior
DPM	diesel particulate matter
DPR	California Department of Parks and Recreation
DRMS	Delta Risk Management Strategy
DSD	Division of Safety of Dams
dw	dry weight
DWR	California Department of Water Resources
DWSC	Deep Water Ship Channel
E/I	export/inflow
EBC	existing biological conditions
EC	electrical conductivity
EC	Environmental Commitments

ECAs	Essential Connectivity Areas
EcoRestore	California EcoRestore
EDMS	Emissions and Dispersion Modeling System
EFH	essential fish habitat
EIR	environmental impact report
EIS	environmental impact statement
ELT	Early Long Term
EQs	Exceedance Quotients
ESA	federal Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
ft	feet
FTE	full time equivalent
GEZs	geotechnical exploration zones
GHG	greenhouse gas
GSAs	Groundwater Sustainability Agencies
GSPs	Groundwater Sustainability Plans
GWh	gigawatt hours
HABS	Historic American Buildings Survey
HCP	habitat conservation plan
HMMP	Hazardous Materials Management Plan
HORB	head of Old River barrier
HRA	health risk assessment
HUs	Habitat Units
IA	Implementation Agreement
in/sec PPV	inches per second peak particle velocity
IRWMP	Integrated Regional Management Plan
IWMA	Integrated Waste Management Act
Lead Agencies	state and federal lead agencies
LLT	Late Long-term
LOS	level of service
LURMP	Land Use and Resources Management Plan
M&I	Municipal and Industrial
Marsh	Suisun Marsh
MCL	maximum contaminant level
Mercury Basin Plan Amendments	Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Methylmercury and Total Mercury in the Sacramento-San Joaquin Delta Estuary
MHHW	mean higher high water
MLLW	mean lower low water

MOA	Memorandum of Agreement
MPOs	metropolitan planning organizations
MRZs	mineral resource zones
MSA	Stockton Metropolitan Statistical Area
MSP	Memorial State Park
MUN	municipal water supply
MW	Megawatt
N:P	nitrogen to phosphorus
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NAWMP	North American Waterfowl Management Plan
NBAAIP	North Bay Aqueduct Alternative Intake Project
NCCP	natural community conservation plan
NCCPA	Natural Community Conservation Planning Act
NEL	numerical effluent limit
NEPA	National Environmental Policy Act
NGO	Non-Governmental Organization
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOA	notice of availability
NOD	Notice of Determination
NOP	notice of preparation
NO_X	nitrogen oxide
NPBs	nonphysical barriers
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTUs	nephelometric turbidity units
O&M	operations and maintenance
OMR	Old and Middle River
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PCI	pavement condition index
PM	particulate matter
PM10	Particulate matter less than 10 microns in diameter
POTWs	publically owned treatment works
PRC	Public Resources Code
QSD	Qualified SWPPP Developer
RDEIR	Partially Recirculated Draft Environmental Impact Report
Reclamation	United States Bureau of Reclamation
REEP	Renewable Energy Procurement Program
ROA	Restoration Opportunity Area
ROD	Record of Decision

ROG	Reactive organic gases
RPA	Reasonable and Prudent Alternative
RPS	Renewables Portfolio Standard
RTM	reusable tunnel material
RTO	Real Time Operations
RWQCB	Regional Water Quality Control Boards
SAP	sampling and analysis plan
SB	Senate Bill
SDEIS	Supplemental Draft Environmental Impact Statement
SFBAAB	San Francisco Bay Area Air Basin
SFNA	Sacramento Federal Nonattainment Area
SGMA	Sustainable Groundwater Management Act
SIPs	state implementation plans
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLR	sea level rise
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMARTS	Stormwater Multiple Application and Report Tracking System
SOCs	sites of concern
SPCCP	Spill Prevention, Containment, and Countermeasure Plan
SPFC	State Plan of Flood Control
SPT	standard penetration test
SR	State Route
SRWTP	Sacramento Regional Wastewater Treatment Plant
State Water Board	State Water Resources Control Board
SVP	Society of Vertebrate Paleontology
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
TBM	tunnel boring machine
TCPs	traditional cultural places
TMDL	Total Maximum Daily Load
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
W	wet years
Water Action Plan	Sustainable Groundwater Management Act
WBS 14	Westside and Northern Pleasant Valley basins
WDR	waste discharge requirements
WQCP	Water Quality Control Plan
WSWA	White Slough Wildlife Management Area
YSAQMD	Yolo-Solano Air Quality Management District

BAY DELTA CONSERVATION PLAN/ CALIFORNIA WATER FIX

PARTIALLY RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT **(RDEIR/SDEIS)**

DOCUMENT REVIEW ROAD MAP

This road map is intended to guide the reviewer in the review of the RDEIR/SDEIS

2013 Public Draft EIR/EIS

Chapter

- ES Executive Summary and Table of Contents
- 1 Introduction
- 2 Project Objectives and Purpose and Need
- 3 Description of Alternatives
- 4 Approach to Environmental Analysis
- 5 Water Supply
- 6 Surface Water
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IMPACTS ARE DISCUSSED BY RESOURCE AREA

2015 RDEIR/SDEIS

Section

- ES Executive Summary and Table of Contents
- 1 Introduction
- 2 Substantive Public Draft EIR/EIS Revisions
- 3 Conveyance Facility Modifications to Alternative 4
- 4 New Alternatives: Alternatives 4A, 2D, and 5A

  Section 4 of the RDEIR/SDEIS contains the analysis of the new alternatives, including the new preferred Alternative, Alternative 4A. These sections discuss the potential impacts of the new alternatives on all of the resources evaluated in the Public Draft EIR/EIS (Chapters 4-30) as well as identification of mitigation and impact conclusions.

  - 4.1 Introduction to New Alternatives
  - 4.2 Impacts of No Action Early Long-Term
    4.2.1 – 4.2.29 Includes analysis of the NAA on all of the resources areas shown in the Public Draft EIR/EIS on the left.
  - 4.3 Impacts of Alternative 4A
    4.3.1-4.3.26 Includes analysis of Alternative 4A on all of the resources areas shown in the Public Draft EIR/EIS on the left.
  - 4.4 Impacts of Alternative 2D
    4.4.1-4.4.26 Includes analysis of Alternative 2D on all of the resources areas shown in the Public Draft EIR/EIS on the left.
  - 4.5 Impacts of Alternative 5A
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  IMPACTS ARE DISCUSSED BY ALTERNATIVE
- 5 Revisions to Cumulative Impact Analyses
- 6 List of Preparers

Appendix A
Revisions to the Public Draft EIR/EIS

2015 RDEIR/SDEIS: Appendix A Revisions to the Public Draft EIR/EIS

Appendix A, *Revisions to the Public Draft EIR/EIS*, includes modified excerpts of text that originally appeared in the Public Draft EIR/EIS, including associated appendices, with underlining showing new language and strikeout showing eliminated text. These underline/strikeout revisions are referenced in the main text of the RDEIR/SDEIS.

Chapter

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IMPACTS ARE DISCUSSED BY RESOURCE AREA

Legend

Chapter 3 describes the alternatives analyzed in Public Draft EIR/EIS. Section 4.1 describes the Alternatives analyzed in the RDEIR/SDEIS.

Sections 4.2 - 4.5 of the RDEIR/SDEIS evaluate the impacts of the new alternatives on environmental resources (all of those listed in Chapter 5-30).

Chapters 5-30 of the Public Draft EIR/EIS evaluate the impacts of the alternatives on environmental resources. Chapter 5-30 in Appendix A of the RDEIR/SDEIS shows the in-text revisions made to the Public Draft EIR/EIS Chapters.

Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft EIR/ Supplemental Draft EIS Executive Summary

ES.1 Introduction

ES.1.1 Background and Context

The Sacramento-San Joaquin Delta (the Delta) is a vitally important ecosystem that supports hundreds of aquatic and terrestrial species, many of which are threatened or endangered. Located at the crux of two major watersheds that capture runoff from approximately 40 percent of the land in California, the Delta is also at the core of the state's most important water system, which serves millions of Californians throughout the San Francisco Bay Area, the Central Valley, the Central Coast, and southern California. This water supports agricultural, municipal, and industrial land uses that, taken together, are the source of much of California's financial stability and prosperity. The benefitting areas include farms and ranches from the north Delta to the Mexican border, as well as Silicon Valley, portions of the East Bay, and most of urban southern California.

Unfortunately, the Delta is in a state of crisis. Several threatened and endangered fish species, including Delta smelt and winter-run Chinook salmon, have recently experienced the lowest population numbers in their recorded history. Meanwhile, Delta levees and the infrastructure they protect are at risk from earthquake damage, continuing land subsidence, and rising sea level. A major seismic event causing levee failure could cause an interruption of water exports for as long as several months or even years. And the amounts of water available for human use south of the Delta have already decreased significantly in recent years, independent of the drought, due to regulatory actions by the United States Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), and the California Department of Fish and Wildlife (CDFW). Applying federal and state endangered species laws, these entities have required the Department of Water Resources (DWR) and the United States Bureau of Reclamation (Reclamation) to substantially alter the manner in which they jointly operate the State Water Project (SWP) and the federal Central Valley Project (CVP).

For both environmental and economic reasons, there is an urgent need to improve and modernize the existing SWP/CVP conveyance system, which was designed and built long before the "environmental era." Many of the current systemic problems stem from the fact that both the SWP and the CVP export water from intake facilities, including pumps, that are located at the far southern edge of the Delta, near the City of Tracy. Because of their far southerly location and their elevation above sea level, these pumps create "reverse flows" that pull river water southward (upstream, in effect) towards the intakes, rather than allowing it to flow downstream towards San Pablo Bay, San Francisco Bay, and, ultimately, the Pacific Ocean. Not surprisingly, these reverse flows cause, or contribute to, direct and indirect impacts on fish species such as Delta smelt, which are pulled towards the pumps, where adverse conditions, including the presence of predator species, await them. The reverse flows also adversely affect salmon migration patterns. To try to reduce these adverse effects on fisheries, regulators have substantially reduced water exports to SWP and CVP service areas, to the economic detriment of those areas. The recent historic drought has only made matters worse.

The ecological problems with the current system could be greatly reduced by the construction and use of new north Delta intake structures with state-of-the-art fish screens. With this future vision in mind, DWR and several state and federal water contractors, in coordination with Reclamation, have proposed a strategy for restoring ecological functions in the Delta while improving water supply reliability in California. These agencies' initial approach, going back as far as 2006, focused on the development of an extensive conservation plan known as the Bay Delta Conservation Plan, or BDCP, which would add new intakes in the north Delta while at the same time pursuing a very large-scale long-term habitat restoration program within the greater Delta. Under this potential approach, DWR would achieve compliance with the federal Endangered Species Act (ESA) through a habitat conservation plan (HCP) approved by both USFWS and NMFS under Section 10 of the ESA, and would achieve compliance with state endangered species laws through approval by CDFW of a natural community conservation plan (NCCP) prepared under the California Natural Community Conservation Plan Act (NCCPA). Both the HCP and NCCP would provide incidental take authorization for a period of 50 years. Reclamation would achieve compliance with ESA through Section 7 of that Act.

In December 2013, after several years of preparation, DWR, Reclamation, USFWS, and NMFS, acting as joint Lead Agencies, published a Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) on the proposed BDCP. This document contained a total of 15 action alternatives, including Alternative 4, which was identified as DWR's preferred alternative. The 14 other action alternatives varied from Alternative 4 with respect to factors such as the number of proposed North Delta intakes, the types of conveyance facilities (e.g., surface canals versus underground pipelines), operational rules, and amounts of proposed habitat restoration. Alternative 4 included three new intakes located in the North Delta and two parallel underground pipelines conveying diverted water to the existing export facilities in the South Delta. The proposed operations for Alternative 4 reflected many years of negotiations between DWR, Reclamation, the water contractors, USFWS, NMFS, and CDFW.

By July 2014, at the end of the public review period, the Lead Agencies had received numerous comments on the proposed BDCP from other agencies and members of the public. Many of these comments included concrete suggestions regarding how, from the commenters' perspectives, the project (i.e., Alternative 4, the BDCP) could be improved. For example, some people urged the Lead Agencies to reduce the level and scope of the construction activities, as well as the sheer size of the proposed facilities, as means of reducing air quality and noise impacts. Other commenters noted that Alternative 4 as then envisioned included substantial amounts of construction activity within Staten Island, which is prime habitat for the greater sandhill crane. Many commenters argued that, because the proposed project would lead to significant, unavoidable water quality effects, DWR could not obtain various approvals needed for the project to succeed (e.g., approval by the State Water Resources Control Board of new points of diversion for north Delta intakes). Yet others suggested that DWR should pursue a permit term shorter than 50 years due to the levels of uncertainty regarding both the future effects of climate change and the long-term effectiveness of habitat restoration in recovering fish populations. Still other comments suggested that the proposed conveyance facilities should be separated from the habitat restoration components of the BDCP, with the latter to be pursued separately.

Consistent with this public input, the Lead Agencies have substantially modified Alternative 4 to reduce its environmental impacts and have formulated new sub-alternatives that would seek incidental take authorization for a period of far less than 50 years, and would include only limited amounts of habitat restoration. The nature of the modifications to Alternative 4 are described at

length in Section 3.1 of this Partially Recirculated Draft EIR/Supplement to Draft EIS (RDEIR/SDEIS); and the Draft EIR/EIS text changes needed to reflect the modifications are shown in "track changes" in Appendix A of this RDEIR/SDEIS. Among the key changes are (i) the elimination of three pumping plants associated with new intake facilities; (ii) associated reductions in construction-related air pollutant emissions at intake sites; (iii) substantial reductions in the amount of construction occurring on Staten Island; (iv) reductions in water quality effects; and (v) the relocation of key project features from private property to public property already owned by DWR.

The three new sub-alternatives (4A, 2D, and 5A) developed by the Lead Agencies embody a different implementation strategy that would not involve a 50-year HCP/NCCP approved under ESA Section 10 and the NCCPA, but rather would achieve incidental take authorization under ESA Section 7 and California Endangered Species Act (CESA) Section 2081(b) assuming a shorter project implementation period. These new sub-alternatives address the reverse flow problem by focusing on the construction and operation of new north Delta intakes and on habitat restoration commensurate with the footprint of these new facilities. This alternative implementation strategy would allow for other state and federal programs to address more extensive long-term habitat restoration efforts for species recovery in programs separate from the proposed project.

The construction and operation of new conveyance facilities, as now proposed under Alternatives 4A, 2D, and 5A, would help resolve many of the concerns with the current south Delta conveyance system while otherwise helping to reduce threats to endangered and threatened species in the Delta through limited but substantial amounts of habitat restoration, as necessary to mitigate significant environmental effects and satisfy applicable ESA and CESA standards. Implementing a dual conveyance system, in which water could be diverted from either the north or the south or both, depending on the needs of aquatic organisms, would align water operations to better reflect natural seasonal flow patterns by creating new water diversions in the north Delta equipped with state-of-the-art fish screens. The new system would reduce the ongoing physical impacts associated with sole reliance on the southern diversion facilities and allow for greater operational flexibility to better protect fish. Minimizing south Delta pumping would provide more natural east–west flow patterns. The new diversions would also help protect critical water supplies against the threats of sea level rise and earthquakes.

Although Alternatives 4A, 2D, and 5A include only those habitat restoration measures needed to provide mitigation for specific regulatory compliance purposes, habitat restoration is still recognized as a critical component of the state's long-term plans for the Delta. Such larger endeavors, however, will likely be implemented over time under actions separate and apart from these alternatives. The primary parallel habitat restoration program is called California EcoRestore (EcoRestore), which will be overseen by the California Resources Agency and implemented under the California Water Action Plan. Under EcoRestore, the state will pursue restoration of more than 30,000 acres of fish and wildlife habitat by 2020. These habitat restoration actions will be implemented faster and more reliably by separating them from the water conveyance facility implementation.

Alternative 4A is also known as "The California WaterFix." It is now DWR's preferred alternative under the California Environmental Quality Act (CEQA) and Reclamation's preferred alternative under the National Environmental Policy Act (NEPA).

ES.1.2 Overview of Key Revisions

This RDEIR/SDEIS has been prepared to provide the public and interested agencies an opportunity to review and comment on revisions and additional information added to the Draft EIR/EIS that was circulated for public review on Dec 13, 2013. Key revisions are listed below.

- Modified project objectives and purpose and need that encompass new alternatives as well as the original alternatives included in the Draft EIR/EIS.
- Engineering refinements made to the Alternative 4 water conveyance facilities, including changes to North Delta Diversion intake facility design; conveyance facility modifications to reduce environmental and property impacts; relocation of pumping plants to a new facility adjacent to Clifton Court Forebay; revisions to proposed conveyance facility operations; and changes to the proposed conservation strategy. These refinements would, among other things, reduce the effects of Alternative 4 on greater sandhill cranes and reduce the extent of construction activities that generate air pollution at intake sites.
- New sub-alternatives, Alternatives 4A, 2D, and 5A, are included to ensure a reasonable range of alternatives are considered that adopt the alternative implementation strategy to achieve federal and state endangered species act compliance using a shorter project implementation period through the "Section 7" process under the federal ESA, and the "Section 2081(b)" process under CESA.
- Updated environmental analysis that addresses certain issues raised in the more than 12,000 comments received on the Draft EIR/EIS. One example of such updated analysis is an updated discussion of Water Quality effects, which have been reduced compared with how they were described in the Draft EIR/EIS.

ES.1.2.1 Legal Basis for Recirculation

In accordance with Public Resources Code (PRC) Section 21092.1 and State CEQA Guidelines Section 15088.5, a CEQA lead agency must "recirculate" a revised Draft EIR or chapters or portions of the revised Draft EIR for additional comments if, after the start of public review but prior to final EIR certification, the lead agency adds "significant new information" to an EIR. Under NEPA, a supplement to the draft EIS may be prepared "when the agency determines that the purposes of NEPA would be furthered by doing so" (40 CFR 1502.9[c][2]) or if 1) the agency makes substantial changes in the proposed action that are relevant to environmental concerns, or 2) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR 1502.9[c][1]).

ES.1.2.2 Modified Project Objectives and Purpose and Need

One of the primary challenges facing California is how to comprehensively address the increasingly significant conflict between the ecological needs of a range of at-risk Delta species and natural communities that have been, and continue to be, affected by human activities, while providing more reliable water supplies for people, communities, agriculture, and industry. This challenge must be addressed in decisions by DWR, the CDFW, and the State Water Resources Control Board as they endeavor to strike a reasonable balance between these competing public policy objectives and various actions taken within the Delta, including this proposed project. State policy regarding the Delta is summarized in the Sacramento–San Joaquin Delta Reform Act of 2009, which states:

> *"it is the intent of the Legislature to provide for the sustainable management of the Sacramento-San Joaquin Delta ecosystem, to provide for a more reliable water supply for the state, to protect and enhance the quality of water supply from the Delta, and to establish a governance structure that will direct efforts across state agencies to develop a legally enforceable Delta Plan." (California Water Code, Section 85001, subd. [c]).*

> *The Delta "serves Californians concurrently as both the hub of the California water system and the most valuable estuary and wetland ecosystem on the west coast of North and South America." (California Water Code, Section 85002).*

The ecological health of the Delta continues to be at risk, the conflicts between species protection and Delta water exports have become more pronounced, as amply evidenced by the continuing court decisions regarding the intersection of ESA, CESA, and the operations criteria of the SWP and the CVP. Other factors, such as the continuing subsidence of lands within the Delta, increasing seismic risks and levee failures, and sea level rise associated with climate change, serve to further exacerbate these conflicts. Simply put, the overall system as it is currently designed and operated does not appear to be sustainable from an environmental perspective, and so the proposal to implement a fundamental, systemic change to the current system is necessary. This change is necessary if California is to "[a]chieve the two coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem." (California Public Resources Code Section 29702, subd. [a]).

A statement of Project Objectives by the Lead Agencies is required by the State CEQA Guidelines, and a Purpose and Need Statement is required by the CEQ NEPA Regulations.

ES.1.2.2.1 Project Objectives

DWR's fundamental purpose in proposing the proposed project is to make physical and operational improvements to the SWP/CVP system in the Delta necessary to restore and protect ecosystem health, water supplies of the SWP and CVP south of the Delta, and water quality within a stable regulatory framework, consistent with statutory and contractual obligations. The fundamental purpose is informed by past efforts taken within the Delta and the watersheds of the Sacramento and San Joaquin Rivers. The fundamental purpose, in turn, gives rise to the following project objectives.

- Address adverse effects to state and federally listed species related to:
  - The operation of existing SWP Delta facilities and construction and operation of facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta;
  - The implementation of actions to improve SWP and/or CVP conveyance that have the potential to result in take of species that are listed under the ESA and CESA.
- Improve the ecosystem of the Delta by reducing the adverse effects to certain listed species of diverting water by siting additional intakes of the SWP and coordinated operations with the CVP;
- Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts and other existing applicable agreements.

Additional Project Objectives that guide the development of the proposed project and alternatives can be found in Section 1.1.4.1 of this RDEIR/SDEIS.

ES.1.2.2.2 Purpose and Need

NEPA requires that an EIS include a statement of "purpose and need" to which the federal agency is responding in proposing the alternatives, including the proposed action. This purpose statement and project need described below are consistent with the Project Objectives outlined above in Section ES.1.2.2.1.

The purposes of the proposed action are to achieve the following.

1. Construction and operation of facilities and/or improvements for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
2. Operation of the existing and potential new SWP facilities and existing CVP Delta facilities.
3. The activities described in 1) and 2) occurring in a manner that minimizes or avoids adverse effects to listed species, and allows for the protection, restoration and enhancement of aquatic, riparian and associated terrestrial natural communities and ecosystems.
4. Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts held by SWP contractors and certain members of San Luis Delta Mendota Water Authority, and other existing applicable agreements.

The above Purpose statement reflects the intent to advance the coequal goals set forth in the Sacramento–San Joaquin Delta Reform Act of 2009 of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The above phrase—*restore and protect the ability of the SWP and CVP to deliver up to full contract amounts*—is related to the upper limit of legal CVP and SWP contractual water amounts and delineates an upper bound for development of EIR/EIS alternatives, not a target. It is not intended to imply that increased quantities of water will be delivered under the proposed project. As indicated by the "up to full contract amounts" phrase, alternatives need not be capable of delivering full contract amounts on average in order to meet the project purposes. Alternatives that depict design capacities or operational parameters that would result in deliveries of less than full contract amounts are consistent with this purpose.

ES.1.2.2.3 Project Need

The need for the action is derived from the multiple, and sometimes conflicting, challenges currently faced within the Delta. The Delta has long been an important resource for California, providing municipal, industrial, agricultural and recreational uses, fish and wildlife habitat, and water supply for large portions of the state. However, by several key criteria, the Delta is now widely perceived to be in crisis. There is an urgent need to improve the conditions for threatened and endangered fish species within the Delta. Improvements to the conveyance system are needed to respond to increased demands upon and risks to water supply reliability, water quality, and the aquatic ecosystem.

To further compound these challenges, fundamental changes to the Delta are certain to occur; the Delta is not a static ecological system. The anticipated effects of climate change will result in elevated sea levels, altered hydrological cycles, changed salinity and water temperatures in and around the Delta, and accelerated shifts in species composition and distribution. These changes add to the difficulty of resolving the conflicts in the Delta. Anticipating, preparing for, and adapting to these changes are key underlying drivers for the proposed project.

ES.1.2.3 Refinements to Alternative 4

Among the purposes of this RDEIR/SDEIS, in addition to introducing Alternatives 4A, 2D, and 5A, are to present revisions to Alternative 4 related to water quality, air quality, and impacts on fish species, and to provide updated analysis on actions to reduce effects of the 2013 Draft EIR/EIS preferred CEQA alternative. In December of 2014, the Lead Agencies publicly announced several design modifications to Alternative 4 to reduce impacts to Delta communities, minimize disturbances or dislocation to greater sandhill cranes, and improve the long-term reliability and operation of the conveyance facilities. Modifications to Alternative 4 include re-design of the north Delta diversions intakes, relocation of pumping plants consolidated at Clifton Court forebay, and removal of transmission lines and reusable tunnel material in sensitive areas, among other changes to the conveyance alignment. Please refer to Section ES.2, *Description of Alternatives*, below for a summary of Alternative 4 modifications and Section 3, *Conveyance Facility Modifications to Alternative 4* of this RDEIR, for a more detailed description of Alternative 4.

Although Alternative 4A is proposed as the new preferred alternative in this RDEIR/SDEIS, Alternative 4 remains an important option for consideration by the Lead Agencies. Alternative 4A includes all of the conveyance components of Alternative 4 and was formulated as an outgrowth of Alternative 4 in response to input from other agencies and members of the public. Alternative 4 remains a potentially viable alternative and is being carried forward in this RDEIR/SDEIS because it represents the original habitat conservation plan/natural community conservation plan (HCP/NCCP) alternative approach, and because it provides an important reference point from which the Alternative 4A, 2D, and 5A descriptions and analyses were developed. The current version of Alternative 4 includes substantial refinements (as indicated above) and reflects additional scientific work and analysis completed since release of the 2013 Draft EIR/EIS that are also carried forward to the new alternatives. For example, all of the new alternatives include the same refinements made for Alternative 4 related to the north Delta diversion intake facilities design, and all of the alternatives include the same conveyance facility alignments as presented for Alternative 4.

ES.1.2.4 Introduction of New Sub-Alternatives

On April 30, 2015, the Lead Agencies publicly announced a proposed modified sub-alternative, Alternative 4A, as the new proposed action, replacing Alternative 4 (the proposed BDCP). During the 2013–2014 public comment period, commenters expressed concerns about the potential impacts of large-scale habitat restoration on the Delta economy and community character. Other comments articulated concerns about the expected effectiveness of certain habitat restoration measures, the nature and uncertainty of climate change, and the related level of scientific uncertainty about future conditions and the efficacy of a 50-year permit.

The primary differences between Alternatives 4A, 2D, and 5A and Alternative 4 include:

- Alternatives 4A, 2D, and 5A would not serve as habitat conservation plans/natural community conservation plans under ESA section 10 and the Natural Community Conservation Planning

Act, but would achieve incidental take authorization under ESA Section 7 and CESA Section 2081(b). DWR would not seek 50-year permits.

- The originally proposed BDCP habitat restoration and other conservation measures (CM) (i.e., CM2 through CM21) would not be included in Alternative 4A, 2D, and 5A, except to mitigate significant environmental effects under CEQA/NEPA and to meet the regulatory standards of ESA Section 7 and CESA Section 2081(b).
- BDCP CM2, which would consist of proposed Yolo bypass improvements and approximately 8,000 acres of tidal habitat restoration, is not included in the new sub-alternatives; instead, these components of CM2 are assumed to occur independently of the sub-alternatives in a revised No Action Alternative.

Alternatives 2D and 5A are presented in addition to Alternative 4A to provide reviewers and decision-makers with a reasonable range of alternatives by which to compare and evaluate the proposed action. Alternatives 2D and 5A propose the same modified regulatory approach as the proposed Alternative 4A.

Although Alternatives 4A, 2D, and 5A comprise only the conveyance facilities and operations that formerly constituted CM1 under BDCP alternatives, and no longer include habitat restoration measures beyond what is needed to provide full mitigation under CEQA and NEPA, habitat restoration is still recognized as a critical component of the state's long-term plans for the Delta. Habitat restoration in the Delta beyond these alternatives' mitigation requirements will occur separately through implementation of California EcoRestore, and these activities will be further developed and evaluated independent of the water conveyance facilities.

ES.1.2.5 Updated Environmental Analysis

Substantive revisions to the Draft EIR/EIS related to the changes noted above, as well as other changes, have been made to RDEIR/SDEIS sections listed below; and these analyses have been applied to all of the impacts analysis for Alternative 4 (in Appendix A) and Alternatives 4A, 2D, and 5A in Section 4.

- Section 2.1, Improved Fish and Aquatic Habitat Analyses
- Section 2.2, Water Quality Revisions
- Section 2.3, Air Quality and Health Risk Assessment
- Section 2.4, Revised Project Description and Enhanced Level of Detail
- Section 2.5, Analysis of Geotechnical Investigations
- Section 5, Revisions to Cumulative Impact Analyses

The RDEIR/SDEIS describes, evaluates, and discloses the potential temporary and permanent direct and reasonably foreseeable indirect impacts to the human and natural environment associated with the proposed actions (Alternative 4A), the changes to Alternative 4, as well as Alternatives 2D and 5A, and the No Action Alternative. The RDEIR/SDEIS also identifies environmental commitments, avoidance and minimization measures, and mitigation measures to reduce or avoid effects. As was the case in the Draft EIR/EIS, Alternative 4 is evaluated at the Late-Long-Term (LLT) timeframe because it would include 50-year incidental take permits. The other alternatives evaluated in the RDEIR/SDEIS, Alternative 4A, 2D, and 5A, are evaluated at the Early Long-Term (ELT) timeframe because the project implementation period is anticipated to be shorter. For NEPA impact

assessment purposes, Alternatives 4A, 2D, and 5A are compared to the No Action Alternative for the Early Long-Term timeframe. Where impacts differ at the Late Long-Term (LLT) period, discussions of these effects were included in the analysis. For CEQA impact assessment purposes, they are compared against Existing Conditions, as generally described in the Draft EIR/EIS. More information about the No Action Alternative ELT is provided in Section 4.2, *Impact of No Action Alternative Early Long-Term*.

ES.1.2.6 Lead Agencies

As a result of changes to the proposed project and the modified regulatory approach for gaining necessary permits, the U.S. Bureau of Reclamation is now acting as the sole federal Lead Agency implementing NEPA. The USFWS and NMFS are now acting as NEPA Cooperating Agencies. The California Department of Water Resources is continuing to act as the state Lead Agency implementing CEQA.

ES.1.3 Areas of Known Controversy

As noted above, the Lead Agencies have prepared the RDEIR/SDEIS to provide the public and interested agencies with updated environmental analysis, to introduce new sub-alternatives, and to address certain issues raised in comments received on the Draft EIR/EIS. Many of these comments helped identify ways in which the BDCP and Draft EIR/EIS could be improved or alternative implementation strategies could be proposed to increase benefits and reduce environmental effects. All of the comments were considered in the decision to circulate the RDEIR/SDEIS.

NEPA and CEQA require that the lead agencies identify areas of known controversy and issues to be resolved that have been raised during the scoping process, public review periods, and throughout the development of alternatives in the EIR/EIS. Based on input from agency representatives and the general public during public scoping and the 2013–2014 comment period, the following issue areas of particular concern have been identified.

- **Range of Alternatives.** The range and adequacy of alternatives is an issue of concern to the public as well as to governmental agencies. In response, the RDEIR/SDEIS proposes three new sub-alternatives.
- **Biological Resources.** The complexity of the BDCP (Alternative 4) raises many concerns over environmental consequences for the aquatic ecosystem and fish species, and for the terrestrial ecosystem and plant and wildlife species. Separating the water conveyance plan from the HCP/NCCP and accelerating environmental restoration through EcoRestore may alleviate some of these concerns.
- **Biological Goals and Objectives.** Controversy exists over the potential conflict between conservation goals and the reasonable use of natural resources and lands for economic development. This issue is somewhat reduced under the new sub-alternatives 4A, 2D, and 5A because of the revised approach to limit habitat improvements to those that would offset conveyance facility effects.
- **Climate Change.** The likely effects of climate changes on water supplies and the Delta ecosystem during the 50-year life of the BDCP prompted many comments during the formal public review process. Comments reflected widespread concerns that the anticipated effects of climate and habitat restoration are too speculative and that there is too much uncertainty about such effects to allow for a 50-year permit period. These comments are among the reasons the

Lead Agencies introduced Alternatives 4A, 2D, and 5A, which do not include a HCP/NCCP and do not seek 50-year incidental take permits.

- **Water Supply, Surface Water Resources, and Water Quality.** Water supply and surface water resources—key drivers for development of the proposed project and its alternatives—remain highly controversial issues for a wide array of stakeholders (e.g., agricultural interests, hunting and fishing interests, water agencies, local jurisdictions) because of the changes in water operations, surface water flow conditions, and diversions that could result from changes to the SWP and CVP systems. Water quality is an issue of concern because of uncertainties regarding activities associated with conveyance facilities and restored habitat that could lead to discharge of sediment, possible changes in salinity patterns, and water quality changes that could result from modifications to existing flow regimes. This RDEIR/SDEIS in Section 4 addresses all of these water supply, surface water and water quality issues.
- **Agricultural Resources.** Because the Plan Area identified for the BDCP (Alternative 4) is largely devoted to agricultural uses, the effects of the BDCP on existing agricultural activities constitute an issue of known controversy. Although Alternatives 4A, 2D, and 5A would require much less conversion of agricultural land to restored or protected habitat than the alternatives that include a HCP/NCCP, agricultural land will still be affected by implementing any of the alternatives.
- **Socioeconomics.** The key socioeconomic concerns involve the impacts of construction activities, the potential losses of business revenues and employment associated with the decrease in agricultural production, and the potential decrease in tax revenues due to such a decline in agricultural activities. Alternative 4 would continue to have these effects while Alternatives 4A, 2D, and 5A would have lesser socioeconomic effects associated with agricultural land conversions compared with other BDCP alternatives.
- **Recreation.** Concerns relating to recreation include potential conflicts between construction and operation of facilities associated with the BDCP (Alternative 4) and ongoing Delta recreational activities (e.g., boating, fishing, hunting, enjoyment of marinas). In addition, there are concerns about possible conflicts between operable barriers and gates in Delta waterways and recreational boating corridors.
- **Aesthetics/Visual Resources.** Potential effects on aesthetics/visual resources are controversial to Plan Area residents. While aesthetic impacts are difficult to quantify, such impacts would be reduced by proposed changes to the conveyance facilities that would be constructed under Alternatives 4, 4A, 2D, and 5A.
- **Growth.** One of the proposed project objectives is to increase water supply reliability to SWP and CVP contractors south of the Delta. Increasing the reliability of water may allow additional growth south of the Delta or in export service areas. Concerns regarding the growth-inducing consequences of the proposed project or its alternatives generally focus on the potential effects of increased water supply to the southern part of the state.
- **Community Issues.** Community issues, such as construction noise, air quality, and traffic circulation effects; conversion of existing land uses; and access to private lands have been controversial topics. Plans by DWR to conduct geotechnical drilling surveys were opposed by the local Farm Bureaus because of concerns over confidentiality of the survey results, and the eminent domain process is currently underway to allow acquisition of temporary entry rights on private land for survey work.

ES.1.4 Readers Guide to the RDEIR/SDEIS

This Executive Summary provides an overview of the substantive changes made to the Draft EIR/EIS, as mentioned above, and a brief summary of the analysis of the impacts of those changes, as well as a guide for reviewing the RDEIR/SDEIS. As an augmentation to the Draft EIR/EIS, the RDEIR/SDEIS is intended to meet the requirements of CEQA and NEPA, to provide sufficient analysis to support decision making, and to inform permit decisions for the issuance of incidental take permits.

The RDEIR/SDEIS presents new information and addresses project revisions in several complementary ways. The main body of the document is organized into *Sections* rather than *Chapters.* This terminology is intended to distinguish references to existing chapters in the Draft EIR/EIS from references to new sections in the RDEIR/SDEIS that may address issues similar to those presented in the Draft EIR/EIS. In many instances, new information and project changes are addressed in stand-alone essays. Each essay discusses a discrete topic that has received substantive comment. These stand-alone essays are intended to make this document as user friendly as possible, and to avoid reprinting thousands of pages on which minor modifications might have been made.

The topical essays in Section 2 of the RDEIR/SDEIS are listed below.

- Section 2.1, *Improved Fish and Aquatic Habitat Analyses*, summarizes revisions made to chapter 11, *Fish and Aquatic Resources* of the Draft EIR/EIS.
- Section 2.2, *Water Quality Revisions*, describes additional analyses undertaken to more accurately characterize the potential for exceedances of water quality standards and summarizes associated revisions.
- Section 2.3, *Air Quality, Health Risk Assessment, Transportation, and Noise Revisions*, presents revised emissions calculations based on improved construction assumptions and updates the health risk assessment, traffic, and noise analyses to reflect improved construction data.
- Section 2.4, *Revised Project Description and Enhanced Level of Detail*, presents additional revisions that explain how, for the purposes of CEQA and NEPA, project-level detail is included for water conveyance facilities and provides additional information about early implementation actions, including examples of habitat restoration and enhancement activities.
- Section 2.5, *Analysis of Geotechnical Investigations*, provides an explanation about the method for incorporating analyses of geotechnical investigations into the analysis of the water conveyance facilities construction

In cases where the essay format was not appropriate, or where actual text changes were necessary to complement particular essays, the RDEIR/SDEIS includes modified excerpts of text that originally appeared in the Draft EIR/EIS, with underlining showing new language and strikeout showing eliminated text. These underline/strikeout revisions are referenced in the main text of the RDEIR/SDEIS as Appendix A, *Revisions to the Draft EIR/EIS*, which contains the actual text revisions. Appendix A does not include Draft EIR/EIS text that was not changed or that may be modified in the Final EIR/EIR in a non-substantive manner, and is focused primarily on impact analysis revisions to Alternative 4, though other BDCP alternatives are addressed for some of the resources for various reasons. To give readers the best possible sense of the context in which such text changes occur, Appendix A includes section headings before and after modified passages, so that readers can understand precisely where within Draft EIR/EIS chapters the revisions occur. Table 1-2 in Section

1, *Introduction*, provides an overview of the Draft EIR/EIS chapters in which substantive changes have been made in this RDEIR/SDEIS and identifies the topics that are addressed in each chapter as shown in Appendix A. For a visual representation of how the document is laid out and how various segments relate to one another, please see the *Document Review Road Map*.

ES.1.4.1 Alternative 4 Revisions

Section 3, *Alternative 4: Conveyance Facility Modifications*, provides an overview of the optimized design of water conveyance facilities associated with Alternative 4, and a summary discussion of the impacts and other associated text revisions made in each affected resource chapter. The resource summaries refer the reader to Appendix A of the RDEIR/SDEIS for detailed revisions made to the Draft EIR/EIS text. Topics include surface water, groundwater, water quality, geology and seismicity, soils, fish and aquatic resources, terrestrial biological resources, land use, agricultural resources, recreation, socioeconomics, aesthetics and visual resources, cultural resources, transportation, public services and utilities, energy, air quality, noise, hazards and hazardous materials, public health, minerals, and paleontological resources.

ES.1.4.2 Alternative 4A, 2D, and 5A Analyses

Description and analysis of new sub-alternatives are presented in Section 4, *New Alternatives: Alternatives 4A, 2D, and 5A*. Analyses presented in this section address impacts for all the resource topics considered in the Draft EIR/EIS. Impacts for which substantive changes have been identified are presented in full impact format with CEQA conclusions and NEPA effects and proposed mitigation measures where they are feasible and required to reduce a significant impact. Impact analyses also include revisions made to the No Action Alternative ELT for the purpose of providing a logical point of comparison for the NEPA analysis of Alternatives 4A, 2D, and 5A.

ES.1.4.3 Cumulative Impact Analyses

Section 5 of this RDEIR/SDEIS addresses revisions to the cumulative impacts analyses. In response to comments, and in light of new information, this RDEIR/SDEIS includes additional reasonably foreseeable proposed projects that, when considered together with the action alternatives, could have a significant cumulative effect. The analysis includes a discussion of the California Water Action Plan, California EcoRestore, and the Sustainable Groundwater Management Act to better describe the roles of the new Delta conveyance facilities and habitat restoration in the context of the state's comprehensive vision for water management.

ES.1.4.4 Supplemental Appendices

Additional components of this RDEIR/SDEIS include multiple appendices, in addition to Appendix A described above, that provide new or updated data used in the revised analyses.

- Appendix B, *Supplemental Modeling Results for New Alternatives*, provides additional CALSIM II, DSM2, and other modeling results referenced for Alternative 4A, 2D, and 5A operations impacts.
- Appendix C, *Supplemental Modeling Results Requested by the State Water Resources Control Board Related to Increased Delta Outflows*, provides supplemental modeling for use in the State Water Board permit process.
- Appendix D, *Substantive BDCP Revisions*, provides the changes that were made to the BDCP after the circulation of the Draft BDCP and Draft EIR/EIS and that are referenced in the RDEIR/SDEIS.

- Appendix E, *Supplemental Information for U.S. Army Corps of Engineers Permitting Requirements*, provides additional information needed for Corps wetland, navigation, levee modification, and cultural resources permitting processes.
- Appendix F, *Supplemental Modeling Results at ELT for Alternative 4*, provides supplemental CALSIM II and DSM2 results for Alternative 4 at the early-long-term that describe H1 and H2 operations scenarios.
- Appendix G, *Alternative 4A (Proposed Project) Compatibility with the Delta Plan*, provides an approach that may be considered for Alternative 4A to meet the Delta Plan consistency requirements.

All components of this RDEIR/SDEIS should be considered complementary to, and should be read and reviewed as supplemental elements of, the December 2013 Bay Delta Conservation Plan Draft Environmental Impact Report/Environmental Impact Statement. The Final EIR/EIS will include the entire presentation of all text changes made to the Draft EIR/EIS.

ES.1.5 Key RDEIR/SDEIS Terms

Due to the changes to the proposed project, there are several key terms that readers should be aware of when reviewing this RDEIR/SDEIS.

- **Plan Area and Study Area.** The terms Plan Area and Study Area are still applied to the impact analysis of Alternatives 4A, 2D, and 5A and all associated figures, tables, etc., since the activities pursued under these alternatives would take place in the same geographical area as the Plan Area; and the potential impacts would still occur in what was defined as the Study Area in the Draft EIR/EIS.
- **Conservation Measures and Environmental Commitments**. Because Alternatives 4A, 2D, and 5A do not include components of a HCP/NCCP, these alternatives do not include Conservation Measures (which are specifically required under Section 10 of the Federal ESA). Rather, limited elements of the previously proposed Conservation Measures are included as "Environmental Commitments" under Alternative 4A to mitigate significant environmental effects under CEQA and meet the regulatory standards of ESA Section 7 and CESA Section 2081(b). To aid reviewers, the Environmental Commitments are numbered to parallel the BDCP (Alternative 4) Conservation Measures, as shown in the examples below.

Alternative 4A	Environmental Commitment 3	Natural Communities Protection and Restoration
Alternative 4	Conservation Measure 3	Natural Communities Protection and Restoration

- **Biological Goals and Objectives and Resource Restoration and Protection Principles for Implementing Environmental Commitments.** Alternatives 4A, 2D, and 5A do not include specific Biological Goals and Objectives such as were included in the BDCP (Alternative 4) because these alternatives do not comprise a proposed HCP/NCCP. However, Alternatives 4A, 2D, and 5A do include species-specific resource restoration and protection principles for implementing Environmental Commitments that would ensure that the implementation of these commitments would achieve the intended mitigation of impacts.
- **Conservation Zones and Restoration Opportunity Areas.** Similar to the Plan Area and Study Area, the Conservation Zones and Restoration Opportunity Areas are still applied to the impact

analysis of Alternatives 4A, 2D, and 5A and all associated figures, tables, etc., since the activities pursued under these alternatives are expected to take place in these same areas.

- **Covered Activities and Covered Species.** Alternatives 4A, 2D, and 5A do not include a list of "covered species" or "covered activities" since these concepts are not requirements of the ESA Section 7 or CESA Section 2081(b) permit processes. However, this RDEIR/SDEIS does include analysis of the special-status species addressed in the new permit process, to the extent that implementation of Alternatives 4A, 2D, and 5A could result in impacts to these species.

ES.1.6 Public Review Process

All of the comments received during the Draft EIR/EIS 2013–2014 public review period were considered in the development of this RDEIR/SDEIS. This RDEIR/SDEIS does not include responses to comments on the Draft EIR/EIS, though some revisions have been made in response to comments received on the Draft EIR/EIS. New public comments made during the public review period for the RDEIR/SDEIS should be specific only to the newly circulated information contained in the RDEIR/SDEIS and should not address issues not directly included in the RDEIR/SDEIS. The Lead Agencies intend to only respond to comments that address analysis included within this RDEIR/SDEIS and not those related solely to the original Draft EIR/EIS. Formal responses to the comments previously submitted on the Draft BDCP and Draft EIR/EIS, as well as comments received on this RDEIR/SDEIS, will be published in the Final EIR/EIS.

This RDEIR/SDEIS is being noticed and circulated for public review and comment until August 31, 2015 in the same manner as the draft documents that were issued for public review on December 13, 2013. Two public meetings will be held to receive comments on the RDEIR/SDEIS, on Tuesday, July 28 in Sacramento, and on Wednesday, July 29, in Walnut Grove. Comments can also be submitted by U.S. mail or email.

BDCP Comments
P.O. Box 1919
Sacramento, CA 95812
BDCPComments@icfi.com

Following the close of the public review period, the Lead Agencies will consider and respond to all significant environmental issues raised in comments on the RDEIR/SDEIS (along with comments previously received on the Draft EIR/EIS) and incorporate revisions and response to comments into the Final EIR/EIS. The Final EIR/EIS will be circulated for a 30-day NEPA review period. Following completion of the Final EIR/EIS and the NEPA 30-day review period, DWR and Reclamation decision-makers will have the opportunity to certify/approve the Final EIR/EIS and submit a Notice of Determination/Record of Decision (NOD/ROD). Upon completion of the NOD/ROD, the agencies would be able to move forward with final permit approval and implementation.

ES.2 Description of Alternatives

In December 2014, state and federal Lead Agencies, along with the administration of Governor Edmund G. Brown Jr., announced several changes to the proposed water conveyance facilities to reduce environmental impacts. Since 2014, additional modifications to the proposed conveyance facilities and operations have been made based on refined engineering analysis and in consideration

of feedback received during the 2014 public comment period. Because the changes to Alternative 4 ripple through multiple environmental resources analyzed, information about the potential impacts of these changes can be found in Section 1.0, *Introduction*, Section 2.0, *Substantive Draft EIR/EIS Revisions*, Section 3.0, *Alternative 4: Conveyance Facility Modifications*, and Section 5.0, *Revisions to Cumulative Impact Analyses.*

As explained above, the RDEIR/SDEIS considers project revisions that were developed in response to input from the Draft EIR/EIS comment period (see below) as well as from agencies' comments regarding the challenges with meeting the standards required to issue long term assurances associated with compliance with Section 10 of the ESA and the NCCPA. Comments suggested DWR should pursue permit terms shorter than 50 years due to the levels of uncertainty regarding effectiveness of habitat restoration and the future effects of climate change. Other comments suggested that the proposed conveyance facility be separated from the habitat restoration components of the BDCP.

Consistent with this input, the Lead Agencies are analyzing an alternative implementation strategy with the new alternatives in this RDEIR/SDEIS, Alternatives 4A, 2D, and 5A. This strategy focuses on the conveyance facility improvements necessary for the SWP to address more immediate water supply reliability needs, and allows for other state and federal programs to address the long-term conservation efforts for species recovery through programs separate from the proposed project analyzed in this RDEIR/SDEIS. Alternatives 4A, 2D, and 5A would enable DWR to construct and operate new conveyance facilities that improve conditions for endangered and threatened aquatic species in the Delta while improving water supply reliability. Implementing the conveyance facilities alone would help resolve many of the concerns with the current south Delta conveyance system, would help reduce conveyance threats to endangered and threatened species in the Delta, and would allow for implementing habitat restoration projects on an expedited schedule through the state's EcoRestore program.

ES.2.1 Alternative 4

Revisions to the BDCP Alternative 4 in this RDEIR/SDEIS are limited to the water conveyance facilities Please refer to Figure ES-1, *Location of Conveyance Facility Alignment for Alternatives 4, 4A, 2D and 5A* for an overview of the conveyance facility alignment. No changes were made to operations or conservation measures. The changes would achieve the benefits listed below.

- Eliminate three pumping plants associated with the new intake facilities, and the visual effects associated with these facilities, on the east bank of the Sacramento River between Clarksburg and Courtland.
- Minimize construction activities on Staten Island, which provides important sandhill crane habitat, by removing tunnel launch facilities, large reusable tunnel material (RTM) storage areas, a barge landing site, and high-voltage power lines.
- Minimize impacts to private landowners by relocating project features to property already owned by DWR and reducing the acreage of lands needing to be acquired from private and Non-Governmental Organization (NGO) landowners.
- Eliminate the need for additional permanent power lines to the intake locations in the north Delta, including lines proposed near Stone Lakes National Wildlife Refuge.

- Eliminate impacts on Italian Slough (near Clifton Court Forebay) by removing an underground siphon.
- Reduce electric power requirements for construction and potentially operation of the facilities.
- Allow water to flow from the Sacramento River and through screened intakes, initial tunnels, an intermediate forebay, main tunnels, and into Clifton Court Forebay entirely by gravity at certain river stages (previously, only flows between the intermediate forebay and Clifton Court Forebay would be conveyed by gravity).
- Reduce tunnel operation and maintenance costs.

These changes would eliminate the need to build three separate two-story pumping plants along the Sacramento River between Clarksburg and Courtland. Instead, water could be moved from the river into tunnels by two new pumping plants constructed 40 miles away on DWR property at the southern end of the tunnels near Clifton Court Forebay.

Under Alternative 4, water would primarily be conveyed from the north Delta to the south Delta through tunnels. Water would be diverted from the Sacramento River through three fish-screened intakes on the east bank of the Sacramento River between Clarksburg and Courtland. Water would travel from the intakes to a sedimentation basin before reaching the tunnels. From the intakes water would flow into an initial single-bore tunnel, which would lead to an intermediate forebay on Glannvale Tract. From the southern end of this forebay, water would pass through an outlet structure into a dual-bore tunnel where it would flow by gravity to the south Delta. Water would then reach pumping plants to the northeast of the Clifton Court Forebay, where water would be pumped into the north cell of the expanded Clifton Court Forebay. The forebay would be dredged and redesigned to provide an area isolating water flowing from the new north Delta facilities. New siphon and canal connections would be constructed between the north cell of the expanded Clifton Court Forebay and the Banks and Jones pumping plants, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta. Alternative 4 would entail the continued use of the SWP/CVP south Delta export facilities. A map and a schematic diagram depicting the conveyance facilities associated with Alternative 4 are also provided in Figures 3-9 and 3-10 in Appendix A of this RDEIR/SDEIS.

ES.2.2 Alternative 4A

Under Alternative 4A water conveyance facilities would be constructed and maintained identically to those proposed and analyzed under Alternative 4 (including the modifications that have been made since the Draft EIR/EIS was released and described in Section 3, *Alternative 4: Conveyance Facility Modifications* and Section ES 2.1, *Alternative 4*, above).

Table ES.2.2.-1, below, provides a side-by-side comparison of Alternative 4 to Alternative 4A.

Table ES.2.2-1. Comparison of Alternative 4 and Alternative 4A

Element of Project Description	Alternative 4 (BDCP)	Alternative 4A
ESA Compliance	Section 10 (DWR)/Section 7 (Reclamation)	Section 7
California Endangered Species law Compliance	NCCPA	2081(b) permit
Facilities	Modified Pipeline/Tunnel Alignment: 3 intakes, 9,000 cfs	Modified Pipeline/Tunnel Alignment: 3 intakes, 9,000 cfs
Operations	Dual Conveyance; Operational Scenarios H1–H4 with Decision Tree (see Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS); evaluated at LLT	Dual Conveyance; Operational Scenario H3+ (a new operational scenario which includes a criterion for spring outflow bounded by the criteria associated with Scenarios H3 and Scenario H4, as described in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS); evaluated as Scenarios H3-H4 at early long-term (ELT, which is associated with conditions around 2025)
Conservation Measures/ Environmental Commitments	Conservation Measures 2–21; includes Yolo Bypass Improvements and 65,000 acres of tidal wetland restoration	Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, 16; includes up to 59 acres of tidal wetland restoration
CEQA Baseline	Existing Conditions	Existing Conditions
NEPA Baseline	No Action Alternative at LLT	No Action Alternative at ELT

While all aspects of water conveyance facility design, construction, and maintenance would be identical to those described for Alternative 4, operational components would be similar, but not identical. Alternative 4A starting operations will be determined through the continued coordination process as outlined in the Section 7 consultation process and 2081(b) permit prior to the start of construction. An adaptive management and monitoring program will be implemented to develop additional scientific information during the course of project construction and operations to inform and improve conveyance facility operational limits and criteria. Additionally, operational elements associated with Fremont Weir modifications would not be incorporated as part of this alternative, because Yolo Bypass improvements previously contemplated in the BDCP (under CM2) would not be implemented as part of Alternative 4A; instead, they would be assumed to occur as part of the No Action Alternative because they are required by the existing Biological Opinions (BiOps) (discussed below). Table 4.1-2 in the RDEIR/SDEIS provides a detailed characterization of operational criteria.

Implementation of Alternative 4A will include conveyance operations of both new and existing water conveyance facilities once the new north Delta facilities are completed and become operational, thereby enabling joint management of north and south Delta diversions. Operational limits included in Alternative 4A for south Delta export facilities would supplement the south Delta operations currently implemented in compliance with the FWS (2008) and NMFS (2009) BiOps. Alternative 4A incorporates existing criteria from the 2008 and 2009 BiOps (including Fall X2), and adds additional criteria for spring outflow and new minimum flow requirement at Rio Vista from January through August. The north Delta diversions and the head of Old River barrier (HORB) are

new facilities for the SWP and CVP and would be operated consistent with the proposed operating criteria for each of these facilities. All other criteria included in the FWS (2008) and NMFS (2009) BiOps and State Water Resources Control Board Water Right Decision 1641 (D-1641) will continue to be complied with, subject to adjustments made pursuant to the adaptive management process as described in the 2008 and 2009 BiOps, as part of the continued operations of the CVP and SWP. Alternative 4A includes modified or new operations and criteria of only the following elements.

- North Delta intake facilities.
- South Delta export operations.
- Head of Old River barrier operations.
- Spring Delta outflow.
- Rio Vista minimum flow standard in January through August.

Alternative 4A operations include a preference for south Delta pumping in July through September to provide limited flushing for improving general water quality conditions and reduced residence times.

To achieve the regulatory standards under ESA Section 7 and CESA Section 2081(b) while also complying with NEPA and CEQA, some of the actions proposed in the conservation strategy for the Draft BDCP would be implemented under Alternative 4A, 2D, and 5A, though on a smaller scale, as environmental commitments to mitigate significant environmental effects of the conveyance facilities. These commitments consist primarily of habitat restoration, protection, enhancement, and management activities necessary to offset—that is, mitigate for—adverse effects from construction of the proposed water conveyance facilities, along with species-specific resources guidelines to ensure that implementation of these commitments would achieve the intended mitigation of impacts. Additionally, pertinent elements previously included as Avoidance and Minimization Measures and the proposed Adaptive Management and Monitoring Program would be implemented as applicable to the activities proposed under Alternative 4A. These, too, would serve a mitigation function under CEQA. All of these components would function as de facto CEQA and NEPA mitigation measures for the construction and operations-related impacts of Alternative 4A. Section 4.1.2.3 of the RDEIR/SDEIS describes and analyzes the Alternative 4A Environmental Commitments.

Portions of the actions previously contemplated under CM3, CM4, CM6, CM7, CM8, CM9, CM10, CM11, CM12, CM15, and CM16 would be included in Alternatives 4A, 2D, and 5A, but at different levels. Table ES.2.2-2 provides a comparison of the acreages or actions for each environmental commitment proposed for Alternatives 4A, 2D, and 5A.

Table ES.2.2-2. Comparison of Environmental Commitments under Alternatives 4A, 2D, and 5A

Environmental Commitments	4A	2D	5A
3: Natural Communities Protection & Restoration			
Valley /Foothill Riparian	103 acres	122 acres	91 acres
Grassland	1,060 acres	1,089 acres	1,034 acres
Vernal Pool Complex & Alkali Seasonal Wetland Complex	150 acres	150 acres	150 acres
Nontidal Marsh	119 acres	187 acres	118 acres
Cultivated Lands	11,870 acres	13,410 acres	11,330 acres
Total:	**Up to 13,302 acres**	**Up to 14, 958 acres**	**Up to 12, 724 acres**
4: Tidal Natural Communities	Up to 59 acres	Up to 65 acres	Up to 55 acres
6: Channel Margin Enhancement	Up 4.6 levee miles	Up to 5.5. levee miles	Up to 3.1 levee miles
7: Riparian Natural Community	Up to 251 acres	Up to 297 acres	Up to 222 acres
8: Grassland Natural Community	Up to 1,070 acres	Up to 1,099 acres	Up to 1,044 acres
9: Vernal Pool & Alkali Seasonal Wetland Complex Restoration	Up to 34 acres	Up to 34 acres	Up to 34 acres
10: Nontidal Marsh Restoration	Up to 832 acres	Up to 1,307 acres	Up to 826 acres
11: Natural Communities Enhancement & Management	At sites protected or restored under Environmental Commitments 3-10	At sites protected or restored under Environmental Commitments 3-10	At sites protected or restored under Environmental Commitments 3-10
12: Methylmercury Management	At sites restored under Environmental Commitment 4	At sites restored under Environmental Commitment 4	At sites restored under Environmental Commitment 4
15: Localized Reduction of Predatory Fishes	At north Delta intakes and at Clifton Court Forebay	At north Delta intakes and at Clifton Court Forebay	At north Delta intakes and at Clifton Court Forebay
16: Nonphysical Fish Barrier	At Georgianna Slough	At Georgianna Slough	At Georgianna Slough

ES.2.3 Other RDEIR/SDEIS Alternatives

Under Alternatives 2D and 5A, water conveyance facilities would be constructed and maintained similarly to those proposed and analyzed under Alternative 4 and 4A. However, Alternative 2D would entail five intakes in the same locations as those under Alternative 2A (as shown in Figure 30-2 of the Draft EIR/EIS), rather than three. As proposed for Alternative 4, a new pumping facility would be constructed northeast of the north cell of the expanded Clifton Court Forebay, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta to the Banks and Jones Pumping Plants. All alternatives would entail the continued use of the SWP/CVP south Delta export facilities.

Alternative 5D would include one intake rather than three. Construction of a single intake site (Intake 2) would preclude the need for ancillary facilities and features associated with Intakes 3 and

5. Alternative 5A would not require construction of a single-bore tunnel between Intake 5 and the intermediate forebay. An operable barrier would not be constructed at the head of Old River.

Operational components of the water conveyance facilities under Alternative 2D would be similar, but not identical, to those described under Scenario B in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS. Operational elements associated with Fremont Weir modifications would not be incorporated, because Yolo Bypass improvements previously contemplated for Alternative 2A would not be implemented as part of Alternative 2D; instead, they would be assumed to occur as part of the No Action Alternative because they are required by the existing BiOps.

Implementation of Alternative 2D would include operations of both new and existing water conveyance facilities once the new north Delta facilities are completed and become operational, thereby enabling joint management of north and south Delta diversions. Operations included in this alternative for south Delta export facilities would replace the south Delta operations currently implemented in compliance with the FWS (2008) and NMFS (2009) BiOps. The north Delta intakes and the HORB would be new facilities for the SWP and CVP. Compliance with all other criteria included in the FWS (2008) and NMFS (2009) BiOps and D-1641, including Fall X2, the E:I ratio, and operations of the Delta Cross Channel gates and the Suisun Marsh Salinity Control Gates, will continue as part of the continued operations of the CVP and SWP. When compared to operations under the No Action Alternative, Alternative 2D includes modified or new operations and criteria of only the following elements.

- North Delta intake facilities.
- South Delta export operations.
- HORB operations.
- Rio Vista minimum flow standard in January through August.

Alternative 2D operations include a preference for south Delta pumping in July through September to provide limited flushing for improving general water quality conditions and reduced residence times.

Operational components of the water conveyance facilities under Alternative 5A would be similar, but not identical, to those described under Scenario C in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS. Operational elements associated with Fremont Weir modifications would not be incorporated as part of this alternative, because Yolo Bypass improvements previously contemplated for Alternative 5 (under CM2) would not be implemented as part of Alternative 5A; instead, they would be assumed to occur as part of the No Action Alternative because they are required by the existing BiOps.

Implementation of Alternative 5A would include operations of both new and existing water conveyance facilities once the new north Delta facilities are completed and become operational, thereby enabling joint management of north and south Delta diversions. The north Delta intake would be a new facility for the SWP. Compliance with all other criteria included in the FWS (2008) and NMFS (2009) BiOps and D-1641, including Fall X2, the E:I ratio, and operations of the Delta Cross Channel gates and the Suisun Marsh Salinity Control Gates, will continue as part of the operation of the CVP and SWP. When compared with operations under the No Action Alternative, Alternative 5A includes modified or new operations and criteria of only the following elements.

- North Delta intake facilities.

- Rio Vista minimum flow standard in January through August.

Alternative 5A operations include a preference for south Delta pumping in July through September to provide limited flushing for improving general water quality conditions and reduced residence times.

As discussed in Section ES 2.1, *Alternative 4*, portions of the actions previously contemplated under CM3, CM4, CM6, CM7, CM8, CM9, CM10, CM11, CM12, CM15, and CM16 would be included in Alternatives 2D and 5A, but at different levels. See Table ES.2.2-2, *Comparison of Environmental Commitments under Alternatives 4A, 2D, and 5A*, above, for a comparison of the implementation of Environmental Commitments.

Table ES.2.3-1 below, provides an overview of the alternatives analyzed in the RDEIR/SDEIS. The complete descriptions of these alternatives is provided in Section 3, *Alternative 4: Conveyance Facility Modifications* and Section 4, *New Alternatives: Alternatives 4A, 2D, and 5A* of this RDEIR/SDEIS.

Table ES.2.3-1. Comparison of Alternative 4, 2D, 4A, 5A

Alternative	Alignment Option	Conveyance Type	Intake Locations	North Delta Diversion Capacity	Operational Scenario	Federal ESA and CESA Compliance Approach
4	Pipeline/ Tunnel	Dual	2, 3, and 5	9,000 cfs	H	Section 10/ NCCP
2D	Pipeline/ Tunnel	Dual	1 through 5	15,000 cfs	B	Section 7/ 2081(b) permit
4A*	Pipeline/ Tunnel	Dual	2, 3, and 5	9,000 cfs	H3+** (See Table ES.2.2-1)	Section 7/ 2081(b) permit
5A	Pipeline/ Tunnel	Dual	2	3,000 cfs	C	Section 7/ 2081(b) permit

* Alternative 4A is the CEQA and NEPA preferred project proposed by State and Federal Lead Agencies.

** Operational Scenario H for Alternative 4A would not include the operation of the Fremont Weir modification associated with Yolo Bypass improvements because those activities would not be implemented as part of Alternative 4A. Starting operations would be determined through the Section 7 and 2081(b) permit processes and an adaptive management and monitoring program would guide future operational limits and criteria.

ES.3 Summary of Substantive Revisions

The following sections provide a brief overview of the substantives changes and conclusions provided in the RDEIR/SDEIS.

ES.3.1 Improved Fish and Aquatic Habitat Analyses

Section 2.1, *Improved Fish and Aquatic Habitat Analyses*, summarizes revisions made to Chapter 11, Fish and Aquatic Resources, since the release of the Draft EIR/EIS. Revisions were made to address design changes associated with the proposed project, incorporate the latest engineering assumptions and modeling procedures, and to respond to comments raised by the public.

ES.3.1.1 Summary of Changes

ES.3.1.1.1 New Data and/or Modeling

- Effects of construction impacts are reassessed to account for changes in the proposed construction approach.
- Potential North Delta Diversion entrainment effects on striped bass and American shad eggs and larvae are revised.
- Analysis to assess the consequences on downstream aquatic habitat was conducted.
- Selenium and mercury analysis and potential effects on aquatic resources are revised.
- Updated water quality data is integrated into selenium quantitative modeling for water and fish tissue.

ES.3.1.1.2 New/Revised Assumptions

- Assessed and revised assumptions related to installation of piles needed for conveyance facility construction.
- Updated reservoir carryover storage for the Existing Conditions baseline.
- Updated assumptions for sea level rise, restoration sediment demand, and effects of the creation of new points of diversion.

ES.3.1.1.3 Summary of Analyses and Results

Draft EIR/EIS Chapter 11, *Aquatic Resources*, provided substantial information about the potential effects of the alternatives on fish and their habitats in the Plan Area and in upstream areas used by the evaluated species. Since release of the Draft EIR/EIS, the chapter has been revised to address design changes associated with the proposed project, to incorporate the latest engineering assumptions and modeling procedures, and to respond to comments raised by the public. Several comments requested elaboration on the methods used to arrive at CEQA conclusions and NEPA effects determinations and on the effects of contaminants. Additionally, commenters requested analyses of the effects on downstream bays (i.e., San Francisco Bay), and that all analyses include a NEPA conclusion. Since release of the Draft EIR/EIS, additional information has been developed pertaining to the following: the use of RTM for restoration efforts; the construction effects of the modification to Clifton Court Forebay; and the construction of an operable barrier at Head of Old River. This section briefly describes the revisions and their effects on the impact analysis.

Revisions to Impacts in Alternatives Included in the Draft EIR/EIS

The following describes the changes in impact conclusions for alternatives included the Draft EIR/EIS based on new information, comments received, and the application of a consistent methodology across alternatives, as shown in Section 11.3.6 of Appendix A of the RDEIR/SDEIS. The same approach was used to determine effects of Alternatives 4A, 2D, and 5A, and the conclusions for those alternatives are shown in Table ES-9, Summary of BDCP/California WaterFix RDEIR/SDEIS Impacts and Mitigation Measures.

- Effects were changed from less-than-significant level (CEQA)/No Determination (NEPA) to less-than-significant level (CEQA)/not adverse (NEPA) for:

- Effects of water operations on rearing habitat (AQUA-5) and migration conditions for delta smelt (AQUA-6) for Alternatives 2A, 2B, 2C, 4, 5, 6A, 6B, 6C, 7, 8, and 9.
- Effects of water operations on spawning, egg incubation, and rearing habitat for longfin smelt (AQUA-22) for Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9.
- Effects of contaminants associated with restoration measures on longfin smelt (AQUA-26) for Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, and 9.
- Effects of water operations on spawning and egg incubation habitat for Chinook salmon (winter-run ESU) (AQUA-40) for Alternatives 4 and 7.
- Effects of water operations on migration conditions for Chinook salmon (winter-run ESU) (AQUA-42) for Alternatives 4, 5, and 7.
- Effects of water operations on spawning and egg incubation habitat for Chinook salmon (spring-run ESU) (AQUA-58) for Alternatives 2A, 4, 5, and 7.
- Effects of water operations on migration conditions for Chinook salmon (spring-run ESU) (AQUA-60) for Alternatives 3, 4, 5, and 7.
- Effects of water operations on migration conditions for Chinook salmon (fall-/late fall–run ESU) (AQUA-78) for Alternative 7.
- Effects of water operations on migration conditions for steelhead (AQUA-96) for Alternatives 3, 4, 5, and 7.
- Effects of water operations on migration conditions for white sturgeon (AQUA-132) for Alternative 4, 5, 6A, 9.
- Effects of water operations on migration conditions for white sturgeon (AQUA-150) for Alternative 1A, 2A, 3, 4, 5, 6A, 7, and 9.

- Effects were changed from less-than-significant level (CEQA)/No Determination (NEPA) to significant and unavoidable with mitigation (CEQA)/adverse (NEPA) for:
  - Effects of water operations on spawning and egg incubation habitat for Chinook salmon (winter-run ESU) (AQUA-40) for Alternative 3.
  - Effects of water operations on migration conditions for Chinook salmon (fall-/late fall–run ESU) (AQUA-78) for Alternative 4.
- Effects were changed from significant and unavoidable with mitigation (CEQA)/adverse (NEPA) to less than significant (CEQA)/not adverse (NEPA) for:
  - Effects of water operations on rearing conditions for Chinook salmon (winter–run ESU) (AQUA-41) for Alternative 2A and 5.
  - Effects of water operations on migration conditions for Chinook salmon (fall-/late fall–run ESU) (AQUA-78) for Alternative 5.
  - Effects of water operations on migration conditions for green sturgeon (AQUA-132) for Alternative 2A and 7.
- Effects were changed from less-than-significant level (CEQA)/no determination/not adverse (NEPA) with no mitigation to less-than-significant level (CEQA)/not adverse (NEPA) for effects

of contaminants associated with restoration (AQUA-8) for Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, and 9.

- Effects of contaminants associated with restoration measures on steelhead (AQUA-98) were changed from less than significant/beneficial (CEQA)/beneficial (NEPA) to less than significant (CEQA)/not adverse (NEPA) for Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9.
- Effects of contaminants associated with restoration measures on green sturgeon (AQUA-134) changed from less than significant/beneficial (CEQA)/beneficial (NEPA) for Alternatives1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 6A, 6B, 6C, 8, and 9 to less than significant/not adverse.
- Effects of contaminants associated with restoration measures on river lamprey (AQUA-188) were changed from less than significant/beneficial (CEQA)/not adverse/beneficial (NEPA) for Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9 to less than significant/not adverse.
- Effects of water operations on entrainment of non-covered aquatic species of primary management concern (AQUA-201) were changed from less than significant (CEQA)/not adverse (NEPA) for Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6B, 6C, 7, 8, and 9 (with the exception of no impact/no effect for California bay shrimp, and beneficial for Alternative 9 for largemouth bass), and less than significant/not adverse for 6A (with exception of beneficial for largemouth bass and no impact/no effect for California bay shrimp), to significant and unavoidable (CEQA)/ adverse (NEPA) for striped bass and American shad under all alternatives (except less than significant/not adverse for Alternative 9) and less than significant (CEQA)/not adverse (NEPA) for the other non-covered fishes under all alternatives
- Effects of water operations on spawning and egg incubation habitat for non-covered aquatic species of primary management concern (AQUA-202) changed from a range of no impact and less than significant/not adverse to less than significant/not adverse, depending on the species.
- Effects of water operations on rearing habitat for non-covered aquatic species of primary management concern (AQUA-203) were changed from a range (depending on the species) of less than significant and significant and unavoidable (CEQA)/not adverse (NEPA) to less than significant/not adverse.

Major Results of Updates to the Fish and Aquatic Habitats Analysis

The following is a summary of the revisions made to Chapter 11, *Fish and Aquatic Resources* in the Draft EIR/EIS. The same approach was used in analyzing new Alternatives 4A, 2D, and 5A presented in this RDEIR/SDEIS.

- The methods section is updated to better explain the rationale and process applied to development of CEQA conclusions and NEPA effects determinations.
- A description of the potential changes in sediment loading as a result of the creation of new points of diversion under Alternatives 1A through 8 is included.
- An analysis of changes in sediment loading to the Bay for all of the alternatives, with specificity to operations-related effects and restoration-related effects, is included.
- The analysis of selenium and mercury has been revised in three locations: revisions to Conservation Measure 12 Methylmercury Management and Avoidance and Minimization Measure 27 Selenium Management (see Appendix D); revisions to the CM4 tidal habitat

contaminants analysis; and a new impact to specifically address effects of contaminants on fish as a result of change in operations (See Chapter 11, Impact AQUA-219 in Appendix A).

- New impacts were created to analyze impacts to fish and aquatic habitat under the No Action Alternative (Impacts AQUA-NAA1-16).
- AMM27 is expanded, with specific requirements included to reduce the potential for bioaccumulation in covered fish species.
- Better understanding and articulation of the potential for selenium and mercury effects on fish as a result of both operations and restoration actions proposed under the alternatives has allowed a more certain determination for contaminants effects under NEPA, which have been determined to be not adverse across all alternatives.
- The effects of underwater noise caused by pile driving were reassessed to account for changes in the proposed construction approach.
- Reanalysis to assess the potential for entrainment of noncovered species of primary management concern because for some (striped bass, American shad) most of their spawning could occur upstream of the proposed north Delta intake locations, and the early life stages (eggs/larvae) would be susceptible to entrainment.

ES.3.2 Water Quality Revisions

Water quality constituent sections in Chapter 8, *Water Quality* of the Draft EIR/EIS that received the most updating were electrical conductivity, chloride, selenium, and bromide. Additionally, assessments of effects on *Microcystis* and constituents downstream of the Plan Area in San Francisco Bay were added. Several other modifications and additions were made to the assessments of mercury, nutrients, trace metals, and dissolved oxygen.

Additionally, three new alternatives, Alternative 4A, 2D, and 5A, were evaluated for effects on water quality from construction and operation of the water conveyance facility (CM1) and for other environmental commitments (CM 3, 4, 6, 7, 9–12, 15, and 16). The alternatives evaluated in Chapter 8 contain many similarities to each other from a water quality perspective, and thus are often grouped together in the following discussion. The three new alternatives are also very similar to each other, but from a water quality perspective, are fundamentally different than the alternatives evaluated in Chapter 8, in that they contain substantially less tidal restoration acreage. Although this section is focused on describing changes made in Chapter 8 from the Draft EIR/EIS, differences between the alternatives assessed in Chapter 8 and the three new alternatives are highlighted where appropriate.

Section 2.2, *Water Quality Revisions*, of this RDEIR/SDEIS describes additional analyses undertaken to more accurately characterize the potential for exceedances of water quality standards and summarizes associated

ES.3.2.1 Summary of Changes

ES.3.2.1.1 New Data and/or Modeling

- New modeling and sensitivity analyses were conducted to evaluate the impacts to electrical conductivity (EC) from:

- Changing the existing Emmaton compliance location to a new location at Threemile Slough.
- Monthly-daily patterning at the Delta boundary locations.
- Including operation of the Suisun Marsh Salinity Control Gates consistent with the assumptions in the No Action Alternative.
- Removing tidal restoration areas (as a means of understanding the contribution of restoration versus CM1 to exceedances of EC objectives).
- Revising Head of Old River Barrier operations during April and May.

- Chloride modeling results were updated:
  - New calculation of exceedances of the 150 mg/L chloride objective were prepared based on calendar years 1976–1990 of the original modeled results (i.e., 15 years instead of 16), because the objective applies on a calendar year basis.
- New calculations were prepared of objective exceedances based on the water year type at the modeled time step (e.g., LLT) rather than the water year type defined for Existing Conditions.
- Selenium modeling was updated to include:
  - Updated source water concentration data.
  - Updated bioaccumulation modeling methodology for bass in the Delta.
  - Expanded discussion of residence time in the Delta and its effect on selenium bioaccumulation in the Delta.
- New modeling for sensitivity analyses was conducted to evaluate what factors were causing or contributing to bromide increases in Barker Slough.
- Water column and fish tissue methylmercury modeling was conducted under Alternative 8 and was corrected to be based on proper source water concentration data.
- A new assessment of *Microcystis aeruginosa* was prepared.
- New assessment of water quality effects in San Francisco Bay was included.
- Updated dissolved oxygen assessment was prepared to include an evaluation of the effects from changes in San Joaquin River flows.

ES.3.2.1.2 New/Revised Assumptions

- The EC compliance location is now at Emmaton instead of Threemile Slough for Alternative 4; Emmaton also is the compliance location for Alternatives 4A, 2D, and 5A.
- The project description now assumes continued operation of the Suisun Marsh Salinity Control Gates for all project alternatives, consistent with assumptions included in the No Action Alternative.

ES.3.2.1.3 New/Revised Criteria or Thresholds

- Updated numeric thresholds were used in the selenium assessment to EPA's draft water quality criteria for the protection of freshwater aquatic life from toxic effects of selenium released in May 2014. The draft criteria include tissue-based concentrations, which are most closely

associated with reproductive effects, and water concentrations, which are to be used when fish tissue data is not available.

ES.3.2.2 Summary of Analyses and Results

The following summarizes the results of the above described revisions on the water quality impact analysis.

EC and Chloride

- With the change in the EC compliance point from Threemile Slough to Emmaton, Alternative 4 no longer shows a significant impact with respect to EC objective exceedance at Emmaton, while all other alternatives still show significant impacts. The three new alternatives assessed (4A, 2D, and 5A) also maintain the existing compliance point at Emmaton and, thus, also do not show significant impacts due to EC objective exceedance at Emmaton.
- Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, and 9 no longer show significant impacts with respect to EC objective exceedance at San Andreas Landing. The new Alternatives, 4A, 2D, and 5A also show no significant impacts with respect to EC objective exceedance at San Andreas Landing.
- Based on the sensitivity analyses, optimizing the design and siting of restoration areas is expected to be able to reduce EC and chloride increases in Suisun Marsh, relative to Existing Conditions and the No Action Alternative, to levels that would be less than significant.
- Revising the assessment of the 150 mg/L chloride objective to properly calculate exceedances on a calendar year basis resulted in fewer exceedances of the objective under the project alternatives assessed in the Draft EIR/EIS (1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9) than previously indicated. The specific number of exceedances predicted under the revised approach varied by alternative, and for some alternatives remained a significant impact. The new Alternatives 4A, 2D, and 5A, did not result in any exceedances of this objective, likely in part due to the lower acreage of tidal restoration included in these alternatives.
- Revising the electrical conductivity assessment to correctly apply the water quality objective based on the modeled time step (i.e., LLT) hydrology and water year type, rather than the Existing Conditions water year type, resulted in the modeled percent of days out of compliance increasing by 0–5% for both the No Action Alternative and project alternatives, depending on the alternative and water quality objective evaluated. However, these changes did not alter any of the related impact conclusions.
- All alternatives assessed in the Draft EIR/EIS (1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9) remained significant and unavoidable for chloride and EC, but based on the sensitivity analyses and revisions identified above, the magnitude of the impacts is substantially less than was indicated in the Draft EIR/EIS.
- Alternatives 4A, 2D, and 5A would not result in significant impacts for EC related to objective exceedance in the Sacramento River at Emmaton, would not result in substantial degradation in the western Delta due to increased chloride concentrations, would have less adverse water quality effects in the western Delta related to EC, and would have fewer exceedances of the fish and wildlife EC objective between Prisoners Point and Jersey Point, such that it is feasible to introduce mitigation that would prevent significant impacts related to EC increases. After introduction of these mitigation measures, Alternatives 4A, 2D, and 5A would result in less than

significant impacts for EC. Alternatives 4A, 2D, and 5A would also result in less than significant impacts for chloride.

Selenium

- Results of updated selenium modeling showed that there would generally be a greater increase from Existing Conditions and No Action Alternative concentrations to the concentrations under the alternatives than previously predicted (i.e., the relative effect of the project alternatives was greater). However, the absolute values of all of the estimated concentrations for Existing Conditions, the No Action Alternative, and all project alternatives were lower than modeled in the Draft EIR/EIS, and thus were lower relative to thresholds of concern and water quality criteria used in the assessment.
- The result of updates to bioaccumulation modeling for selenium is that predicted bass tissue concentrations in the Delta are more consistent across location and alternative than was determined in the Draft EIR/EIS. This update could not be made for sturgeon bioaccumulation modeling because there was insufficient monitoring data to calibrate the model for such a change.
- The changes discussed above did not result in any changes to the selenium impact conclusions in the Draft EIR/EIS.

Bromide

- The cause of the modeled increases in bromide in Barker Slough, which was driving the impact conclusion for almost all alternatives, is due to the assumptions regarding tidal habitat restoration not due to conveyance facility operations. Thus, the mitigation measure was revised to more appropriately address actions that could lessen the projected impact, based on these findings.
- Because new alternatives 4A, 2D, and 5A contain a lower acreage of tidal restoration, significant impacts with regard to bromide are not expected under these alternatives.

Mercury

- Revisions and updates to mercury modeling results made for Alternative 8 lowered the concentrations predicted under Alternative 8, but did not change the assessment conclusions.
- Implementation of restoration under the Environmental Commitments would result in significant and unavoidable impacts with regard to mercury concentrations under Alternatives 4A, 2D, and 5A; however, these effects would be localized in the vicinity of restoration areas and the magnitude of effect would be less than other alternatives because the amount of restoration proposed under the new alternatives would be substantially less than other proposed alternatives.

Microcystis

- Because of the combined effects of increased temperatures due to climate change (not related to the project alternatives) and increased residence times in the Delta (due primarily to the effects of the conveyance facility and tidal restoration), effects of project alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9 on *Microcystis* were considered adverse (under NEPA) and significant and unavoidable (under CEQA). Mitigation measure WQ-32 was created to attempt to lessen the effects of the alternatives on Microcystis.

- Because new alternatives 4A, 2D, and 5A contain a lower acreage of tidal restoration, residence times related to implementation of the alternative are not expected to increase as substantially, and thus significant impacts with regard to *Microcystis* are not expected under these alternatives, relative to Existing Conditions and the No Action Alternative.

San Francisco Bay

- These assessment of seaward effects of the project alternatives did not identify any new adverse or significant impacts or any substantial increase in the severity of previously identified impacts, except in the case of selenium. For Alternatives 6–9, projected increases in selenium loading and concentrations in North San Francisco Bay were considered adverse (under NEPA) and significant and unavoidable (under CEQA), while Alternatives 1–5 were considered not adverse and less than significant.

Dissolved Oxygen

Analysis of flows in the San Joaquin River at Stockton showed that in most cases flows decreased by a small amount and, thus, would not be expected to substantially move the location of minimum DO in the river.

ES.3.3 Air Quality, Health Risk Assessment, Traffic and Noise Revisions

Section 2.3, *Air Quality, Health Risk Assessment, Transportation, Noise, and Energy Revisions*, presents updated calculations based on improved construction assumptions and revises the impact assessment to reflect the amended construction data. The following summarizes the changes that can be found in Section 2.3 and Appendix A of the RDEIR/SDEIS.

ES.3.3.1 Summary of Changes

ES.3.3.1.1 New Data and/or Modeling

- Revised mobile, marine and helicopter source emissions, modeling based on updated guidance documents and new models, including the California Air Resources Board (ARB) model, EMFAC2014.
- Updated concrete batching modeling based on CO_2 emission factors for anticipated compression strength values.
- Included fugitive reactive organic emissions from asphalt paving.
- Modeled receptor exposure to localized PM2.5 and PM10 concentrations.
- Estimated gasoline and diesel consumption by equipment and vehicles.

ES.3.3.1.2 New/Revised Assumptions

- Updated 2014 economic assessment ("cost estimate"), including revised truck trip, scheduling, material quantity, and equipment operating assumptions.
- Revised activity scaling factors for the PTO, East, West, and SCO alternatives.
- Updated construction electricity demand based on changes to project design.

- Refined environmental commitments that establish aggressive performance standards equipment, vehicles, and material movement activities.
- Revised O&M assumptions based on changes to project design.
- Revised cancer risk calculation daily breath rates and faction at home assumptions per Office of Environmental Health Hazard guidance.

ES.3.3.1.3 New/Revised Criteria or Thresholds

- Air district thresholds for localized PM2.5 and PM10 exposure.

ES.3.3.2 Summary of Analyses and Results

- Revised air quality, health risk, noise, and traffic analysis based on updated construction assumptions outlined in the 2014 cost estimate from 5RMK Inc.
- Revised air quality and Health Risk Assessment (HRA) impact analysis based on updated performance standards outlined in the Construction Equipment Exhaust Reduction Plan.
- Incorporated new air quality models and emission factors released since the Public Draft EIR/EIS.
- Revised operational emissions based on the latest understanding of project operations.
- Expanded the analysis of odor impacts to consider excavated organic matter and land use change.
- Included the General Conformity determination under the Clean Air Act.
- Added explicit identification and disclosure of health risks from receptor exposure to localized particulate matter, localized carbon monoxide, localized diesel particulate matter, and *C. immitis* (Valley Fever).
- Revised cancer risk calculations to account for the fraction of time spent at home and daily breath rates by age groups, per OEHHA 2015 guidance.
- Incorporated an estimate of diesel and gasoline consumption into the energy impact analysis.

ES.3.4 Terrestrial Resources Revisions

The analysis for Alternative 4 in Chapter 12, *Terrestrial Biological Resources*, of the Draft EIR/EIS was revised to account for changes in the magnitude of direct impacts on natural communities and species habitat associated with the footprint of the revised water conveyance facilities, including the revised power line alignment and assumptions. In addition, analyses for the three new sub-alternatives (Alternatives 4A, 2D, and 5A) were conducted. The following summarizes the changes that can be found in Chapter 12*, Terrestrial Biological Resources*, Section 12.3.3.9 of Appendix A of the RDEIR/SDEIS and the new analyses can be found in Section 4 of the RDEIR/SDEIS.

ES.3.4.1 Summary of Changes

ES.3.4.1.1 New Data and/or Modeling

- Updated method for mapping and quantifying wetlands and waters of the United States.
- Updated term of Avoidance and Minimization Measures (AMM) implementation.
- Updated AMM2 Construction Best Management Practices, AMM6 Disposal and Reuse of Spoils, Reusable Tunnel Material, and Dredged Material, AMM11 Covered Plant Species, AMM18 Swainson's Hawk and White-Tailed Kite, AMM19 California Clapper Rail and California Black Rail, AMM20 Greater Sandhill Crane, AMM26 Salt Marsh Harvest Mouse and Suisun Shrew, and AMM27 Selenium Management.
- Updated acreage impacts of Alternative 4.
- Updated impacted acres of tidal perennial aquatic natural community, tidal freshwater emergent wetland natural community, valley/foothill riparian natural community, nontidal perennial aquatic natural community, nontidal freshwater perennial emergent wetland natural community, alkali seasonal wetland complex natural community aquatic habitat, vernal pool complex natural community, managed wetland, grassland natural community, vernal pool crustacean modeled habitat, modeled valley elderberry longhorn beetle habitat, vernal pool habitat, and nonlisted vernal pool invertebrate habitat in the study area.
- Updated impacted acres of the California red-legged frog, California tiger salamander, giant garter snake, western pond turtle, special-status reptiles, California black rail, California least tern, greater sandhill crane, lesser sandhill crane, least Bell's vireo, yellow warbler, Swainson's hawk, tricolored blackbird, western yellow-billed cuckoo, white-tailed kite, yellow-breasted chat, Cooper's hawk and osprey, golden eagle and ferruginous hawk, double-crested cormorant, great blue heron, great egret, snowy egret, black-crowned night heron, short-eared owl, northern harrier, mountain plover, California horned lark, grasshopper sparrow, least bittern, white-faced ibis, loggerhead shrike, Modesto song sparrow, yellow-headed blackbird, riparian brush rabbit, San Joaquin kit fox, San Joaquin pocket mouse, special-status bats, grassland plant species, valley/foothill riparian plant species, tidal wetland plant species, and nontidal wetland plant species.
- Updated methylmercury exposure impact discussion for California black rail, California clapper rail, California least tern, greater sandhill crane, lesser sandhill crane, Suisun song sparrow, saltmarsh common yellowthroat, tricolored blackbird, double-crested cormorant, great blue heron, great egret, snowy egret, black-crowned night heron, least bittern, white-faced ibis, and yellow-headed blackbird.
- Updated acres of fill of jurisdictional wetlands waters associated with all alternatives.
- Updated acres of potentially jurisdictional wetlands and waters potentially affected by CM2-CM10 under Alternative 4.
- Revised California least tern indirect effect CEQA conclusion to less-than-significant.
- Updated acres of fill of jurisdictional wetlands associated with all alternatives.
- Updated acres of potentially jurisdictional wetlands and waters potentially affected by CM2–CM10 under Alternative 4.

ES.3.4.2 Summary of Analyses and Results

The terrestrial resources analysis for Alternative 4 was revised to reflect impacts that changed due to a revised project footprint for Alternative 4. Affected species and habitats were updated with the number of impacted acres of habitat and the impact discussion was revised accordingly (see Appendix 12E *Detailed Accounting of Direct Effects of Alternatives on Natural Communities and Covered Species* in Appendix A of this RDEIR/SEIS). Species with habitats that include high tidal marshes are at risk for methylmercury exposure. Modeled methylmercury effects on largemouth bass (used as a surrogate species for analysis) did not differ substantially from existing conditions. Restoration actions that would create high and low tidal marsh, which is Black Rail habitat, could provide biogeochemical conditions for methylation of mercury in the in the newly inundated soils. There is potential for increased exposure of the foodwebs to methylmercury in these areas, with the level of exposure dependent on the amounts of mercury available in the soils and the biogeochemical conditions. Methylmercury effects discussions were updated and CM12 was expanded for each species to address methylmercury effects. NEPA effects and CEQA conclusions for Alternative 4 terrestrial resources in the RDEIR/SDEIS remained generally consistent with the Draft EIR/EIS.

The RDEIR/SDEIS also includes analyses of the new sub-alternatives (Alternatives 4A, 2D, and 5A). These analyses can be found in Sections 4.3.8 (Alternative 4A), 4.4.8 (Alternative 2D), and 4.5.8 (Alternative 5A) of this RDEIR/SEIS. Tidal restoration under these alternatives would be substantially less than under the BDCP and thus the impacts to terrestrial resources from tidal restoration would be considerably less. However, the benefits of the large amount of tidal restoration, as well as other large amounts of other natural community restoration under the BDCP, would not occur under Alternatives 4A, 2D, and 5A, which is reflected in the NEPA effects and CEQA conclusions for several natural communities that went from being beneficial under the BDCP Alternatives to less-than-significant under Alternatives 4A, 2D, and 5A. The NEPA effects and CEQA conclusions for the other terrestrial resources are also different than those of the BDCP alternatives and, where different, change from being not adverse/less-than-significant to no effect/no impact.

A summary of some of the key revisions found in the RDEIR/SEIS compared to the Draft EIR/EIS are presented below.

- Inclusion of NEPA effects determinations for Impact BIO-69 Loss or Conversion of Habitat for and Direct Mortality of Greater Sandhill Crane and BIO-70 Effects on Greater Sandhill Crane Associated with Electrical Transmission Facilities under all alternatives.
- Updated NEPA effects determinations for indirect effects from methylmercury for several species under Alternative 4.
- Revised Mitigation Measure BIO-147: Monitor Bank Swallow Colonies and Evaluate Winter and Spring Flows Upstream of the Study Area.
- Revised Mitigation Measure BIO-162: Conduct Preconstruction Survey for American Badger.
- New Mitigation Measure BIO-176: Compensatory Mitigation for Fill of Waters of the U.S.

ES.3.5 Revised Project Descriptions and Enhanced Level of Detail (Alt 4)

Section 2.4, *Revised Project Description and Enhanced Level of Detail*, presents additional revisions that explain how, for the purposes of CEQA and NEPA, project-level detail is included for water conveyance facilities and provides additional information about early implementation actions, including examples of habitat restoration and enhancement activities.

ES.3.5.1 Summary of Analyses and Results

The RDEIR/SDEIS includes a number of revisions to the project description and an enhanced level of detail for Alternatives 4, 4A, 2D, and 5A. These include more explanation regarding the analysis of water conveyance facilities, updates to conservation measures and environmental commitments and their use to offset impacts related to the project, and more information on the role of the Bureau of Reclamation, as NEPA Lead Agency and other cooperating and responsible agencies.

Each component feature of the water conveyance facilities is analyzed at a resource-specific level. Following the release of the Draft EIR/EIS, DWR's Division of Engineering created a revised project footprint for Alternative 4. Some of the major changes include removing pumping plants from the north Delta and creating combined pumping plants on the north end of Clifton Court Forebay in the south Delta, which would allow water to flow by gravity through the conveyance facilities. The alignment was also revised to lessen impacts to wildlife on Staten Island.

Analyses of Alternatives 4 and 4A in the RDEIR/SDEIS reflect this new project footprint. Alternatives 2D and 5A reflect the alignment except for the number and location of intakes. Similar to Alternative 2, Alternative 2D also incorporates five intakes, but the rest of the alignment is identical to that of Alternative 4. Similar to Alternative 5, Alternative 5A incorporates only one intake, but the rest of the alignment is identical to that of Alternative 4. The impact analyses of these alternatives rely on GIS data from DWR that incorporates the recent revisions to the alignment of water conveyance features and associated lands required for construction.

The RDEIR/SDEIS reflects changes made to the conservation measures, environmental commitments, and AMMs for Alternative 4 and, where applicable, Alternatives 4A, 2D, and 5A. Many of the conservation measures from the Draft EIR/EIS became environmental commitments in the RDEIR/SDEIS for Alternatives 4A, 2D, and 5A. These revisions are made to ensure that the conservation measures (in Alternative 4), or environmental commitments in Alternatives 4A, 2D, and 5A, are described consistently where needed in the RDEIR/SDEIS and reflect additional detail that may have been developed since publication of the Draft BDCP, such as updated acreages for mitigation measures. A discussion of the conservation measures and AMMs that have been substantively changed and that would potentially affect the characterization of impacts can be found in Appendix D.

ES.3.6 Analysis of Geotechnical Investigations

Section 2.5, *Analysis of Geotechnical Investigations*, provides an explanation about the method for incorporating analyses of geotechnical investigations into the analysis of the water conveyance facilities construction.

ES.3.6.1 Summary of Analyses and Results

As described in Appendix 3B, *Environmental Commitments*, in Appendix A of this RDEIR/SDEIS, DWR will perform a series of geotechnical investigations along both the selected water conveyance alignment and at locations proposed for facilities or material borrow areas. The work to be performed will constitute a subsurface investigation program to provide information required to support the design and construction of the water conveyance facilities. Geotechnical investigations will be conducted to identify surface and subsurface conditions as necessary to complete design of the water conveyance facilities.

Following publication of the Draft EIR/EIS, DWR developed a Draft Geotechnical Exploration Plan (Phase 2) for the Alternative 4 conveyance alignment. The geotechnical investigation plan provides additional details regarding the rationale, investigation methods and locations, and criteria for obtaining subsurface soil information and laboratory test data (California Department of Water Resources 2014). The proposed exploration is designed as a two-part program (Phases 2a and 2b) to collect geotechnical data relevant to engineering issues associated with conveyance facility construction (as opposed to learning more about the environmental impacts of those facilities). The two-part program will allow refinement of the second part of the program to respond to findings from the first part.

Because this new information allows for a more detailed assessment of the potential environmental effects resulting from geotechnical investigations than that which appeared in Chapter 31 of the Draft EIR/EIS, the activities described in the geotechnical plan have been incorporated into the revised impact analysis for Alternative 4 and the analysis of Alternatives 4A, 2D, and 5A in this RDEIR/SDEIS (see Section 3, *Alternative 4: Conveyance Facility Modifications*, for a description of other revisions to facility design and Appendix A for revised Draft EIR/EIS text).

ES.3.7 Revisions to Cumulative Impact Analyses

ES.3.7.1 Summary of Analyses and Results

In response to comments raised by key stakeholders during the public comment period, and in light of changes that have occurred over time in project landscapes and the availability of new information since the 2009 release of the Notice of Preparation and the 2011 commencement of the extensive amounts of modeling undertaken for the Draft EIR/EIS, the cumulative analysis presented in the Draft EIR/EIS has been revised.

CEQA Guidelines Section 15130 requires the consideration of cumulative impacts within an EIR when a proposed project's incremental contribution to a larger universe of significant cumulative effects from multiple projects is itself "cumulatively considerable." "Cumulatively considerable" means that "the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (CEQA Guidelines, § 15065[a][3]). A similar requirement to examine cumulative impacts exists for NEPA documents, and is required by Council on Environmental Quality (CEQ) regulations (CEQ 1987). Section 5 of this RDEIR/SDEIS updates and revises the cumulative impacts analysis presented in the Draft EIR/EIS; it also adds a discussion of the cumulative impacts associated with Alternatives 4A, 2D, and 5A.

Section 5 breaks the cumulative analysis into two separate pieces which build upon each other. First, Section 5.2.1 examines concurrent project effects, considering potential additive effects of project components that are constructed during the same time period. Then, Section 5.2.2 describes the revisions to the cumulative analysis under each resource topic and the effects of these revisions on the cumulative impact analysis when considered in concert with the effects of the project effects described in Section 5.2.1. References have been made to specific sections of the chapters that have been revised. Analyses of the cumulative impacts for Alternatives 4A, 2D, and 5A are also included.

Table 5.2.1-1 in Section 5 of this RDEIR/SDEIS provides a summary of the potential interim implementation actions that could be implemented concurrently during the conveyance facility construction period as early implementation actions under CM2–CM11. The concurrent project analysis was included to ensure that the total combined impacts of the conveyance facility and other BDCP conservation measures (such as restoration actions scheduled to occur during conveyance facility construction) were fully evaluated in this RDEIR/SDEIS. Alternatives 4A, 2D, and 5A would not be expected to have the same magnitude of concurrent effects as other alternatives because habitat environmental commitments proposed under the new alternatives are limited to actions needed to offset effects of the conveyance facilities.

Proposed future projects that have since become more defined or developed since 2011 have been addressed in the revised cumulative impact analysis as appropriate in either a qualitative or quantitative fashion. The California Water Action Plan, California EcoRestore, and the Sustainable Groundwater Management Act are included in this list of interim implementation projects. For a complete list of such projects, consult Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project Alternative*, and *Cumulative Impact Conditions*, in Appendix A of the RDEIR/SDEIS.

ES.4 Mitigation and Adaptive Management

ES.4.1 Mitigation Measures, Avoidance and Minimization Measures, and Environmental Commitments

This RDEIR/SDEIS presents the impacts of the action alternatives and incorporates a variety of methods to reduce adverse/significant impacts on the physical and human environment whenever it is feasible to do so. The methods used to reduce impacts include: 1) modification of project designs and construction assumptions to avoid or reduce potential project impacts, 2) incorporation of environmental commitments, AMMs and CMs into action alternatives, 3)application of additional mitigation measures to reduce alternative effects, and 4) use of a collaborative science, monitoring and adaptive management approach to address uncertainties and adjust project implementation as needed to avoid or reduce impacts. The following provides a summary of these methods used to reduce or avoid environmental effects with references to the various locations in the RDEIR/SDEIS.

ES.4.1.1 Project Definition and Design of Project Elements

This RDEIR/SDEIS includes analyses that reflect modification of the conveyance facility designs for Alternative 4, and the additional sub-alternatives 4A, 2D, and 5A. Design revisions were made to improve the constructability of the proposed conveyance facilities, reduce impacts on sensitive species and resources, avoid and reduce effects on private property owners, and reduce

construction costs. Some of the ways in which environmental effects have been reduced with new facility designs include:

- Reducing visual and aesthetic resource and land use impacts related to north Delta diversion intake pumping plants near the Sacramento River by consolidating and relocating the plants to Clifton Court Forebay.
- Eliminating the realignment of SR 160 at the north Delta diversion intake sites to reduce wetland/riparian impacts and effects on the Stone Lakes National Wildlife Refuge.
- Moving tunnel launch shaft sites off of Staten Island to reduce effects on greater sandhill cranes and their habitat.
- Changing the location of permanent electric transmission lines to reduce potential effects on bird species and aesthetic and visual resources effects.
- Consolidating reusable tunnel material disposal sites to use more State owned property and reduce potential agricultural effects.
- Changing the tunnel alignment to terminate at the Northeast portion of Clifton Court Forebay on State owned property.

Additionally, the new sub-alternatives are also defined to reduce the land use changes and agricultural land conversion associated with natural community restoration and protections needed to offset conveyance facility effects. Please refer to Section 3, *Conveyance Facility Modifications to Alternative 4* and Section 4, *New Alternatives: Alternatives 4A, 2D, and 5A* for an overview of the conveyance facility construction design changes.

ES.4.1.2 Environmental Commitments, AMM's and Conservation Measures

This RDEIR/SDEIS also includes environmental commitments and AMMs that are Best Management Practices and other actions that have been incorporated into the action alternatives to avoid and reduce potential environmental impacts. CMs which are part of BDCP Alternatives 1A–9 (including the modified Alternative 4 presented in this RDEIR/SDEIS) are intended to offset the biological effects of the alternatives and establish a strategy to improve conditions for covered species. These commitments, AMMs and CMs are distinguished from mitigation measures in that they are commitments built into the definition of the action alternatives as compared to mitigation measures which are recommended to reduce adverse or significant environmental impacts. For the new sub-alternatives 4A, 2D, and 5A, environmental commitments are also included in the project definition to distinguish habitat and other project components that have been modified from conservation measures presented for BDCP Alternatives 1A–9 in the Draft EIR/EIS. All of the environmental commitments and summaries of the AMMs are presented in Appendix 3B, *Environmental Commitments, AMMs and CMs* in RDEIR/SDEIS Appendix A, along with a discussion of how the actions would be effective at reducing various environmental effects.

ES.4.1.3 Mitigation Measures

To meet the requirements of CEQA and NEPA, mitigation measures are recommended in this RDEIR/SDEIS to reduce significant or adverse impacts of the action alternatives to the extent possible. Mitigation measures are recommended when the project design, environmental commitments, AMMs and CMs are not sufficient to reduce impacts or when these project measures

are not relevant to a particular impact. In many cases mitigation measures are recommended to reduce the construction effects of conveyance facilities on resources located within the conveyance facility alignments. For example, impacts on agriculture, recreation, aesthetics and visual resources, and cultural resources that occur within conveyance facility alignments are identified as significant impacts for which mitigation measures are recommended to reduce the impacts. In other cases, mitigation measures are proposed to reduce impacts of the conveyance facilities on sensitive receptors or infrastructure such as in the case of air quality, noise, transportation and public services impacts. Although many of the operational effects of the conveyance facilities have been reduced by design of the facility operational criteria and rules, which reflect state and federal requirements of SWP/CVP operation, additional mitigation measures are included for some of the water quality and fish and aquatic resources impacts. In a number of cases significant impacts are identified for CEQA purposes that cannot be fully mitigated to a less-than-significant level. In all of these cases, mitigation measures are recommend to attempt to reduce the potential impact to the greatest extent possible.

Please refer to Table ES-9, Summary of BDCP/California WaterFix RDEIR/SDEIS Impacts and Mitigation Measures for a detailed summary of all of the impacts and mitigation measures included in the RDEIR/SDEIS. Full text of the mitigation measures are included by reference and presented in Appendix A and the Draft EIR/EIS.

ES.4.2 Collaborative Science and Adaptive Management Program

Considerable scientific uncertainty exists regarding the Delta ecosystem, including the effects of CVP and SWP operations and the related operational criteria. To address this uncertainty, DWR, Reclamation, CDFW, USFWS, NMFS, and the public water agencies will establish a robust program of collaborative science, monitoring, and adaptive management. For the purposes of analysis, it is assumed that the Adaptive Management and Monitoring Plan (AMMP) developed for Alternative 4A would not, by itself, create nor contribute to any new significant environmental effects; instead, the AMMP would influence the operation and management of facilities and protected or restored habitat associated with Alternative 4A.

Collaborative science and adaptive management will support the proposed project by helping to address scientific uncertainty where it exists, and as it relates to the benefits and impacts of the construction and operations of the new water conveyance facility and existing CVP and SWP facilities. Specifically, collaborative science and adaptive management will, as appropriate, develop and use new information and insight gained during the course of project construction and operation to inform and improve:

- the design of fish facilities including the intake fish screens;
- the operation of the water conveyance facilities under the Section 7 biological opinion and 2081(b) permit; and
- habitat restoration and other mitigation measures conducted under the biological opinions and 2081(b) permits.

In summary, the broad purposes of the program will be to: (1) undertake collaborative science, (2) guide the development and implementation of scientific investigations and monitoring for both

permit compliance and adaptive management, and (3) apply new information and insights to management decisions and actions. Each purpose is further described below.

Collaborative Science

The program will provide guidance and recommendations on relevant science related to the operations of the CVP and SWP within the Delta to inform implementation of the existing BiOps for the coordinated operations of the SWP and CVP and the 2081(b) permit for the SWP facilities and operations, as well as for the new biological opinion and 2081(b) for this proposed project. The collaborative science effort will build on the progress being made by the existing Collaborative Science and Adaptive Management Program (CSAMP) that was established to make recommendations on the science needed to inform implementation of or potential changes to the existing BiOps for the SWP and CVP operations, and proposed alternative management actions. The CSAMP process and its Collaborative Adaptive Management Team (CAMT) rely on the Delta Science Program to provide independent peer review of both science proposals and products.

Results from the collaborative science produced under the program would inform policy makers from the agencies implementing or overseeing the proposed project. These policy makers would determine whether and how to act on the information within the regulatory contexts of the biological opinions, 2081(b) permits, and other relevant authorizations (e.g., Corps permits, State Board authorizations).

Monitoring

Monitoring is a critical element of the adaptive management program and a required component of ESA Section 7 biological opinions and CESA 2081(b) permits. In addition, monitoring is a critical element of the collaborative science process that informs adaptive management decision-making. The proposed compliance and effectiveness monitoring program for the CESA 2081(b) permit is described in Chapter 6 of that permit application. These monitoring programs overlap but have distinct elements owing to their overlapping but distinct species lists.

Management Recommendations, Decisions, and Actions

The collaborative science effort is expected to inform operational decisions within the ranges established by the biological opinion and 2081(b) permit for the proposed project. However, if new science suggests that operational changes may be appropriate that fall outside of the operational ranges evaluated in the biological opinion and authorized by the 2081(b) permit, the appropriate agencies will determine whether those changes should be implemented. An analysis of the biological effects of any such changes will be conducted to determine if those effects fall within the range of effects analyzed and authorized under the biological opinion and 2081(b) permit. If NMFS, USFWS, or CDFW determine that impacts to listed species are greater than those analyzed and authorized under the biological opinion and 2081(b) permit, consultation may need to be reinitiated and/or the permittees may need to seek a 2081(b) permit amendment. Likewise, in the unlikely event analysis shows that impacts to water supply are greater than those analyzed in this EIR/EIS, it may be necessary to complete additional environmental review to comply with CEQA or NEPA.

The collaborative science process will also inform the design and construction of the fish screens on the new intakes. This requires active study to maximize water supply, ensure flexibility in their design and operation, and minimize effects to covered species. The collaborative science process

will similarly inform adaptive management of habitat restoration and other mitigation measures required by the existing and new biological opinion and 2081(b) permit.

Structure of Collaborative Science

The collaborative science elements of the program will build on the experience gained in the CSAMP process, Collaborative science for the proposed project is expected to follow a similar organizational model in which management decisions are made by the appropriate agencies within their authorities and collaborative science is undertaken by managers and scientists from participating entities, and other stakeholders as will be described in the Memorandum of Agreement (MOA) between DWR, Reclamation, the public water agencies, CDFW, NMFS, and USFWS. In keeping with the existing CSAMP model, future members of the collaborative science process will have expertise or technical skills that would enable them to contribute to the tasks outlined above. Membership from each group will be limited to maintain the effectiveness of the group. Other senior scientists may be invited to participate by mutual consent. If useful, the group could form technical subgroups or use existing subgroups to inform its work. Decisions about what science to pursue would be made by consensus. The group will integrate the work of relevant existing groups and processes (e.g., Delta Science Program and Interagency Ecological Program) to avoid duplicating work.

Funding for collaborative science and monitoring will be implemented, when feasible, using existing resources from state, federal, and other programs, and the mitigation program of the water conveyance facility. The mitigation program has money dedicated to the monitoring necessary to support effective implementation of mitigation actions. Proponents of the collaborative science and monitoring program will agree to provide or seek additional funding when existing resources are insufficient. The budget will be based on annual workplans. The proponents also will ensure the availability of funding for monitoring and the requirements defined in the biological opinion and 2081(b) permit.

Scientific Basis for Adaptive Management

Adaptive management is a systematic process to continually improve management policies and practices by learning from our actions (Holling 1978; Walters 1986). It requires well-articulated management objectives to guide decisions about what science to try, and explicit assumptions about expected outcomes to compare against actual outcomes (Williams et al. 2009). Adaptive management uses a process to clearly articulate objectives, identify management alternatives, predict management consequences, recognize key uncertainties in advance, and monitor and evaluate outcomes. This structured and systematic process is what differentiates adaptive management from a trial and error approach (National Research Council 2004a; Williams 2011a). Learning, facilitated through deliberate design and testing, is an integral component of adaptive management (Williams et al. 2009; Allen et al. 2011; Williams 2011a).

Adaptive management is a particularly useful framework in the face of scientific uncertainty. The principles of adaptive management lend themselves to water management and ecological restoration in the Bay-Delta (CALFED Bay-Delta Program 2000; Reed et al. 2007, 2010; Healey 2008; Dahm et al. 2009; National Research Council 2011; Parker et al. 2011, 2012; Delta Stewardship Council 2013). In particular, a National Research Council (2011) panel found that despite the challenges, there often is no better option for implementing water management regimes. The adaptive management program for the proposed project will be designed and implemented with these principals and scientific guidance in mind.

ES.5 Summary of Impacts

Table ES-9, Summary of BDCP/California WaterFix RDEIR/SDEIS Impacts and Mitigation Measures summarizes, by resource area, the environmental impacts of implementing Alternatives 4, 4A, 2D, and 5A. NEPA and CEQA impact conclusions are provided for all of the impacts presented in this RDEIR/SDEIS and mitigation measures are identified that if implemented would reduce impacts. The impact conclusions after mitigation measures are applied are also summarized.

Table ES-9. Summary of BDCP/California WaterFix RDEIR/SDEIS Impacts and Mitigation Measures

Notes:

1. These conclusions reflect implementation of Environmental Commitments 3, 4, 6–12, 15 and 16 (as described in Section 4.1 of the RDEIR/SDEIS), and Avoidance and Minimization Measures (described in detail in the Appendix 3C of the BDCP and in Appendix D of the RDEIR/SDEIS), which are considered a part of each action alternative. In some cases, mitigation measures proposed under one resource section (e.g., terrestrial biological resources) are also proposed to reduce effects on another resource topic (e.g., recreation). These mitigation measures are cross-referenced wherever they may reduce effects. Additional discussion of each effect and mitigation measure can be found under the referenced resource-specific chapter(s).
2. While many impact headers (see "Potential Impact" column) describe specific effects associated with BDCP action alternatives (e.g., the effects of implementing one or more conservation measures proposed as part of the BDCP), the conclusions provided for No Action Alternative (NAA) represent the anticipated effects on a resource as a result of future conditions in the absence of BDCP implementation. For the EIR/EIS analysis, the No Action Alternative assumptions are described in Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project Alternative, and Cumulative Impact Conditions*.
3. The names of some of the numbered impacts have been slightly modified in the text to more accurately reflect the impacts resulting from implementing Alternatives 4A, 2D, or 5A. Although names of some of these impacts have been modified, the impact number sequence remains accurate as are the findings shown in this table. The impact names in the table reflect the same as what was shown in the DEIR/SEIS.
4. Impacts which refer to conservation measures (from the Draft EIR/S) correspond to identically numbered Environmental Commitments for Alternatives 4A, 2D, and 5A in the Recirculated Draft EIR/Supplemental EIS. (For more information, see Section 4.1 in the RDEIR/SDEIS.)

Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Water Supply					
WS-1: Changes in SWP/CVP water deliveries during construction	NAA, 2D, 4, 4A, 5A	NI		NI	NE
WS-2: Change in SWP and CVP deliveries	NAA, 2D, 4, 4A, 5A	N/A[1]		N/A	N/A
WS-3: Effects of water transfers on water supply	NAA, 2D, 4, 4A, 5A	N/A[2]		N/A	N/A
Surface Water					
SW-1: Changes in SWP or CVP reservoir flood storage capacity	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
SW-2: Changes in Sacramento and San Joaquin River flood flows	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
SW-3: Change in reverse flow conditions in Old and Middle Rivers	NAA, 2D, 4, 4A, 5A	ND		ND	ND
SW-4: Substantially alter the existing drainage pattern or substantially increase the rate or amount of surface runoff in a manner that would result in flooding during construction of conveyance facilities	NAA, 2D, 4, 4A, 5A	S	SW-4: Implement measures to reduce runoff and sedimentation	LTS	NA
SW-5: Substantially alter the existing drainage pattern or substantially increase the rate or amount of surface runoff in a manner that would result in flooding during construction of habitat restoration area facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	SW-4: Implement measures to reduce runoff and sedimentation	LTS	NA

[1] Findings were not made for these due to the approach in this analysis.

[2] Findings were not made for these due to the approach in this analysis.

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
SW-6: Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	SW-4: Implement measures to reduce runoff and sedimentation	LTS	NA
SW-7: Expose people or structures to a significant risk of loss, injury or death involving flooding due to the construction of new conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	SW-7: Implement Measures to Reduce Flood Damage	LTS	NA
SW-8: Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding due to habitat restoration	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	SW-8: Implement measures to address potential wind fetch issues	LTS	NA
SW-9: Place within a 100-year flood hazard area structures which would impede or redirect flood flows, or be subject to inundation by mudflow	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	SW-4: Implement measures to reduce runoff and sedimentation	LTS	NA
Groundwater					
Changes in Central and South Delta flow	NAA (ELT)	NI		NI	NE
Changes in Delta Groundwater Levels[3]	NAA (ELT)	NI		NI	NE[4]
Changes in Delta Groundwater Quality[1,]	NAA (ELT)	LTS		LTS	NA
Changes in Delta Agricultural Drainage[1]	NAA (ELT)	LTS		NI	NE
San Joaquin Basin Groundwater Levels[5]	NAA (ELT)	S		S	A
Tulare Basin Groundwater Levels[3]	NAA (ELT)	S		S	A
Tulare Basin Groundwater Flow[3]	NAA (ELT)	LTS		LTS	NA
San Joaquin and Tulare Basin Land Subsidence[3]	NAA (ELT)	LTS		LTS	NA
Other Portions of the Export Service Areas–Groundwater supplies, recharge, and local groundwater table levels	NAA (ELT)	S		S	A
Ongoing Plans, Policies, and Programs	NAA (ELT)	LTS		LTS	NA
GW-1: During construction, deplete groundwater supplies or interfere with groundwater recharge, alter local groundwater levels, or reduce the production capacity of preexisting nearby wells	2D, 4, 4A, 5A	S	GW-1: Maintain water supplies in areas affected by construction dewatering	SU	A
GW-2: During operations, deplete groundwater supplies or interfere with groundwater recharge, alter local groundwater levels, or reduce the production capacity of preexisting nearby wells	2D, 4, 4A, 5A	LTS		LTS	NA

[3] Includes effects of climate change and sea level rise at 2060 (2025 for REIR/S)
[4] Increased groundwater level due to sea level rise in San Francisco Bay may result in a beneficial effect on shallow well yields
[5] SWP/CVP Export Service Areas

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
GW-3: Degrade groundwater quality during construction and operation of conveyance facilities	2D, 4, 4A, 5A	LTS		LTS	NA
GW-4: During construction of conveyance facilities, interfere with agricultural drainage in the Delta	2D, 4, 4A, 5A	LTS		LTS	NA
GW-5: During operations of new facilities, interfere with agricultural drainage in the Delta	2D, 4, 4A, 5A	S	GW-5: Agricultural lands seepage minimization	SU	A
GW-6: Deplete groundwater supplies or interfere with groundwater recharge, alter local groundwater levels, reduce the production capacity of preexisting nearby wells, or interfere with agricultural drainage as a result of implementing CM2–CM22	2D, 4, 4A, 5A	S	GW-5: Agricultural lands seepage minimization	SU	A
GW-7: Degrade groundwater quality as a result of implementing CM2–CM22	2D, 4, 4A, 5A	S	GW-7: Provide an alternate source of water	SU	A
GW-8: During operations, deplete groundwater supplies or interfere with groundwater recharge, alter groundwater levels, or reduce the production capacity of preexisting nearby wells	2D, 4A, 5A	LTS[6]		LTS	B
	4, 6A, 6B, 6C, 7, 8, 9	S	No feasible mitigation to address this impact	SU	A
GW-9: Degrade groundwater quality	2D, 4, 4A, 5A	LTS[7]		LTS	NA
GW-10: Result in groundwater level-induced land subsidence	2D, 4, 4A, 5A	LTS		LTS	NA
Water Quality					
WQ-1: Effects on ammonia concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-2: Effects on ammonia concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-3: Effects on boron concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-4: Effects on boron concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-5: Effects on bromide concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-6: Effects on bromide concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-7: Effects on chloride concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-8: Effects on chloride concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA

[6] For Alternative 4A, the impact could be significant/adverse in certain areas of Southern California depending on the range of Spring Delta outflows that affect the surface water deliveries and associated groundwater usage.
[7] For Alternative 4A, the impact could be significant/adverse, as related to impact GW-8

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
WQ-9: Effects on dissolved oxygen resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-10: Effects on dissolved oxygen resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-11: Effects on electrical conductivity concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	S	WQ-11: Avoid or Minimize Reduced Water Quality Conditions WQ-11a: Adaptively Manage Diversions at the North and South Delta Intakes to Reduce or Eliminate Water Quality Degradation in Western Delta. WQ-11b: Adaptively Manage Head of Old River Barrier and Diversions at the North and South Delta Intakes to Reduce or Eliminate Exceedances of the Bay-Delta WQCP Objective at Prisoners Point.	LTS	NA
WQ-12: Effects on electrical conductivity concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-13: Effects on mercury concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-14: Effects on mercury concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	S	No available mitigation to address this impact	SU	A
WQ-15: Effects on nitrate concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-16: Effects on nitrate concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-17: Effects on organic carbon concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-18: Effects on organic carbon concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-19: Effects on pathogens resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-20: Effects on pathogens resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-21: Effects on pesticide concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-22: Effects on pesticide concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-23: Effects on phosphorus concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-24: Effects on phosphorus concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
WQ-25: Effects on selenium concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-26: Effects on selenium concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-27: Effects on trace metal concentrations resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-28: Effects on trace metal concentrations resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-29: Effects on TSS and turbidity resulting from facilities operations and maintenance (CM1)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-30: Effects on TSS and turbidity resulting from implementation of CM2–CM22	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-31: Water quality impacts resulting from construction-related activities (CM1–CM22)	2D, 4, 4A, 5A	LTS		LTS	NA
WQ-32: Effects on Microcystis Bloom Formation Resulting from Facilities Operations and Maintenance (CM1).	1A-2C, 3, 4, 5, 6A-9	S	WQ-32a: Design Restoration Sites to Reduce Potential for Increased Microcystis Blooms WQ-32b: Investigate and Implement Operational Measures to Manage Water Residence Time	SU	A
	2D, 4A, 5A	LTS		LTS	NA
WQ-33: Effects on Microcystis Bloom Formation Resulting from Other Conservation Measures (CM2–CM21).	1A-2C, 3, 4, 5, 6A-9	S	No available mitigation to address this impact	SU	A
	2D, 4A, 5A	LTS		LTS	NA
WQ-34: Effects on San Francisco Bay Water Quality Resulting from Facilities Operations and Maintenance (CM1) and Implementation of CM2–CM21	1A-9	LTS		LTS	NA
Geology and Seismicity					
GEO-1: Loss of property, personal injury, or death from structural failure resulting from strong seismic shaking of water conveyance features during construction	NAA	NI		NI	NA
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-2: Loss of property, personal injury, or death from settlement or collapse caused by dewatering during construction of water conveyance features	NAA	NI		NI	NA
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-3: Loss of property, personal injury, or death from ground settlement during construction of water conveyance features	NAA	NI		NI	NE
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-4: Loss of property, personal injury, or death from slope failure during construction of water conveyance features	NAA	B		B	B
	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
GEO-5: Loss of property, personal injury, or death from structural failure resulting from construction-related ground motions during construction of water conveyance features	NAA	NI		NI	NE
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-6: Loss of property, personal injury, or death from structural failure resulting from rupture of a known earthquake fault during operation of water conveyance features	NAA	NI		NI	NE
	2D, 4, 4A, 5A	NI		NI	NE
GEO-7: Loss of property, personal injury, or death from structural failure resulting from strong seismic shaking during operation of water conveyance features	NAA	NI		NI	NE
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-8: Loss of property, personal injury, or death from structural failure resulting from seismic-related ground failure (including liquefaction) during operation of water conveyance features	NAA	NI		NI	NE
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-9: Loss of property, personal injury, or death from landslides and other slope instability during operation of water conveyance features	NAA	B		B	B
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-10: Loss of property, personal injury, or death from seiche or tsunami during operation of water conveyance features	NAA	B		B	B
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-11: Ground failure caused by increased groundwater surface elevations from unlined canal seepage as a result of operating the water conveyance facilities	NAA	NI		NI	NE
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-12: Loss of property, personal injury, or death resulting from structural failure caused by rupture of a known earthquake fault at Restoration Opportunity Areas	NAA	NI		NI	NE
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-13: Loss of property, personal injury, or death from structural failure resulting from strong seismic shaking at Restoration Opportunity Areas	NAA	NI		NI	NE
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-14: Loss of property, personal injury, or death from structural failure resulting from seismic-related ground failure (including liquefaction) beneath Restoration Opportunity Areas	NAA	NI		NI	NE
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-15: Loss of property, personal injury, or death from landslides and other slope instability at Restoration Opportunity Areas	NAA	B		B	B
	2D, 4, 4A, 5A	LTS		LTS	NA
GEO-16: Loss of property, personal injury, or death from seiche or tsunami at Restoration Opportunity Areas as a result of implementing the conservation actions	NAA	B		B	B
	2D, 4, 4A, 5A	LTS		LTS	NA
Soils					
SOILS-1: Accelerated erosion caused by vegetation removal and other soil disturbances as a result of constructing the proposed water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
SOILS-2: Loss of topsoil from excavation, overcovering, and inundation as a result of constructing the proposed water conveyance facilities	NAA	S		S	A
	2D, 4, 4A, 5A	S	SOILS-2a: Minimize extent of excavation and soil disturbance SOILS-2b: Salvage, stockpile, and replace topsoil and prepare a topsoil storage and handling plan	SU	A
SOILS-3: Property loss, personal injury, or death from instability, failure, and damage from construction on or in soils subject to subsidence as a result of constructing the proposed water conveyance facilities	NAA	S		S	A
	2D, 4, 4A, 5A	LTS		LTS	NA
SOILS-4: Risk to life and property as a result of constructing the proposed water conveyance facilities in areas of expansive, corrosive, and compressible soils	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
SOILS-5: Accelerated bank erosion from increased channel flow rates as a result of operations	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
SOILS-6: Accelerated erosion caused by clearing, grubbing, grading, and other disturbances associated with implementation of proposed Environmental Commitments 3, 4, and 6–11	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
SOILS-7: Loss of topsoil from excavation, overcovering, and inundation associated with restoration activities as a result of implementing the proposed Environmental Commitments 3, 4, and 6–11	NAA	S		S	A
	2D, 4, 4A, 5A	S	SOILS-2a: Minimize extent of excavation and soil disturbance SOILS-2b: Salvage, stockpile, and replace topsoil and prepare a topsoil storage and handling plan	SU	A
SOILS-8: Property loss, personal injury, or death from instability, failure, and damage from construction on soils subject to subsidence as a result of implementing the proposed Environmental Commitments 3, 4, and 6–11	NAA	B		B	B
	2D, 4, 4A, 5A	LTS		LTS	NA
SOILS-9: Risk to life and property from construction in areas of expansive, corrosive, and compressible soils as a result of implementing the proposed Environmental Commitments 3, 4, and 6–11	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
Fish and Aquatic Resources					
AQUA-NAA1: Effects of construction of facilities on covered fish species	NAA	LTS		LTS	NA
AQUA-NAA2: Effects of maintenance of facilities on covered fish species	NAA	LTS		LTS	NA
AQUA-NAA3: Effects of water operations on entrainment of covered fish species	NAA	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-NAA4: Effects of water operations on spawning and egg incubation habitat for covered fish species	NAA	LTS S (winter-run Chinook salmon and green sturgeon)	No feasible mitigation to address this impact on Chinook salmon	SU	A (winter-run Chinook salmon and green sturgeon)
AQUA-NAA5: effects of water operations on rearing habitat for covered fish species	NAA	S		S	NA
AQUA-NAA6: Effects of water operations on migration habitat for covered fish species	NAA	LTS		LTS	NA
AQUA-NAA7: Effects of habitat restoration on covered fish species	NAA	LTS		LTS	NA
AQUA-NAA8: Effects of other Conservation Measures on covered fish species	NAA	LTS		LTS	B
AQUA-NAA9: Effects of construction of facilities on non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA10: Effects of maintenance of facilities on non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA11: Effects of water operations on entrainment of non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA12: Effects of water operations on spawning and egg incubation habitat for non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA13: Effects of water operations on rearing habitat for non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA14: Effects of water operations on migration habitat for non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA15: Effects of habitat restoration on non-covered fish species	NAA	LTS		LTS	NA
AQUA-NAA16: Effects of other Conservation Measures on non-covered fish species	NAA	LTS		LTS	B
AQUA-1: Effects of construction of water conveyance facilities on delta smelt	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-2: Effects of maintenance of water conveyance facilities on delta smelt	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-3: Effects of water operations on entrainment of delta smelt					
	2D, 4, 4A	LTS		LTS	B
	5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-4: Effects of water operations on spawning and egg incubation habitat for delta smelt	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-5: Effects of water operations on rearing habitat for delta smelt	4, 4A	LTS		LTS	NE
	1A, 1B, 1C, 3	LTS		LTS	A
	2A, 2B, 2C, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 5A	LTS		LTS	NA
AQUA-6: Effects of water operations on migration conditions for delta smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-7: Effects of construction of restoration measures on delta smelt	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-8: Effects of contaminants associated with restoration	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-9: Effects of restored habitat conditions on delta smelt	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-10: Effects of methylmercury management on delta smelt (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-13: Effects of localized reduction of predatory fish on delta smelt (CM15)	2D, 4, 4A, 5A	NI		NI	NE
AQUA-14: Effects of nonphysical fish barriers on delta smelt (CM16)	4, 4A	LTS		LTS	NE
	2D, 5A	LTS		LTS	NA
AQUA-19: Effects of construction of water conveyance facilities on longfin smelt	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-20: Effects of maintenance of water conveyance facilities on longfin smelt	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-21: Effects of water operations on entrainment of longfin smelt	4, 4A, 5A	B		B	NA
	2D	B		B	B

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-22: Effects of water operations on spawning, egg incubation, and rearing habitat for longfin smelt	4, 4A	S	AQUA-22D: Ensure January though June Delta outflows do not result in changes in longfin smelt abundance	LTS	NA
	5A	S	AQUA-22a: Following initial operations of water conveyance facilities, conduct additional evaluation and modeling of impacts to longfin smelt to determine feasibility of mitigation to reduce impacts to spawning and rearing habitat AQUA-22b: Conduct additional evaluation and modeling of impacts on longfin smelt rearing habitat following initial operations of water conveyance facilities AQUA-22c: Consult with USFWS and CDFW to identify and implement feasible means to minimize effects on longfin smelt rearing habitat consistent with water conveyance facilities	S	A
	2D	S	AQUA-22a: Following initial operations of water conveyance facilities, conduct additional evaluation and modeling of impacts to longfin smelt to determine feasibility of mitigation to reduce impacts to spawning and rearing habitat AQUA-22b: Conduct additional evaluation and modeling of impacts on longfin smelt rearing habitat following initial operations of water conveyance facilities AQUA-22c: Consult with USFWS and CDFW to identify and implement feasible means to minimize effects on longfin smelt rearing habitat consistent with water conveyance facilities	S	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQUA-25: Effects of construction of restoration measures on longfin smelt	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-26: Effects of contaminants associated with restoration measures on longfin smelt	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4A, 5A	LTS		LTS	NA
AQUA-27: Effects of restored habitat conditions on longfin smelt	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-28: Effects of methylmercury management on longfin smelt (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-31: Effects of localized reduction of predatory fish on longfin smelt (CM15)	2D, 4, 4A, 5A	NI		NI	NE
AQUA-32: Effects of nonphysical fish barriers on longfin smelt (CM16)	4, 4A	NI		NI	NE
	2D, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-37: Effects of construction of water conveyance facilities on Chinook salmon (winter-run ESU)	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-38: Effects of maintenance of water conveyance facilities on Chinook salmon (winter-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-39: Effects of water operations on entrainment of Chinook salmon (winter-run ESU)	2D, 4, 4A, 5A	B		B	B
AQUA-40: Effects of water operations on spawning and egg incubation habitat for Chinook salmon (winter-run ESU)	4, 4A, 5A, 7	LTS		LTS	NA
	2D	S	AQUA-40a: Following initial operations of water conveyance facilities, conduct additional evaluation and modeling of impacts to winter-run Chinook salmon to determine feasibility of mitigation to reduce impacts to spawning habitat AQUA-40b: Conduct additional evaluation and modeling of impacts on winter-run Chinook salmon spawning habitat following initial operations of water conveyance facilities AQUA-40c: Consult with NMFS, USFWS, and CDFW to identify and implement potentially feasible means to minimize effects on winter-run Chinook salmon spawning habitat consistent with water conveyance facilities	S	NA
	3	S		S	A
AQUA-41: Effects of water operations on rearing habitat for Chinook salmon (winter-run ESU)	2A, 2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-42: Effects of water operations on migration conditions for Chinook salmon (winter-run ESU)	4, 5, 7, 4A, 5A	LTS		LTS	NA
	2D	S	AQUA-42a: Following initial operations of water conveyance facilities, conduct additional evaluation and modeling of impacts to winter-run Chinook salmon to determine feasibility of mitigation to reduce impacts to migration conditions AQUA-42b: Conduct additional evaluation and modeling of impacts on winter-run Chinook salmon migration conditions following initial operations of water conveyance facilities AQUA-42c: Consult with NMFS and CDFW to identify and implement potentially feasible means to minimize effects on winter-run Chinook salmon migration conditions consistent with water conveyance facilities operations	S	A

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 8, 9	LTS		LTS	NA/B[8]
AQUA-43: Effects of construction of restoration measures on Chinook salmon (winter-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-44: Effects of contaminants associated with restoration measures on Chinook salmon (winter-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-45: Effects of restored habitat conditions on Chinook salmon (winter-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-46: Effects of methylmercury management on Chinook salmon (winter-run ESU) (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-49: Effects of localized reduction of predatory fish on Chinook salmon (winter-run ESU) (CM15)	2D, 4, 4A, 5A	NI		NI	NE
AQUA-50: Effects of nonphysical fish barriers on Chinook salmon (winter-run ESU) (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-55: Effects of construction of water conveyance facilities on Chinook salmon (spring-run ESU)	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-56: Effects of maintenance of water conveyance facilities on Chinook salmon (spring-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-57: Effects of water operations on entrainment of Chinook salmon (spring-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-58: Effects of water operations on spawning and egg incubation habitat for Chinook salmon (spring-run ESU)	2A, 2B, 2C, 4, 5, 7, 2D, 4A, 5A	LTS		LTS	NA
AQUA-59: Effects of water operations on rearing habitat for Chinook salmon (spring-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NE

[8] The effects of short-term restoration construction activities would not be adverse; the overall long-term effects of habitat restoration are expected to be beneficial to winter-run Chinook salmon and other covered species by providing additional or improved habitat.

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-60: Effects of water operations on migration conditions for Chinook salmon (spring-run ESU)	4, 4A, 5A, 3, 5, 7	LTS		LTS	NA
	2D	S	AQUA-60a: Following initial operations of water conveyance facilities, conduct additional evaluation and modeling of impacts to spring-run Chinook salmon to determine feasibility of mitigation to reduce impacts to migration conditions AQUA-60b: Conduct additional evaluation and modeling of impacts on spring-run Chinook salmon migration conditions following initial operations of water conveyance facilities AQUA-60c: Consult with NMFS and CDFW to identify and implement potentially feasible means to minimize effects on spring-run Chinook salmon migration conditions consistent with water conveyance facilities	S	A
AQUA-61: Effects of construction of restoration measures on Chinook salmon (spring-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-62: Effects of contaminants associated with restoration measures on Chinook salmon (spring-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-63: Effects of restored habitat conditions on Chinook salmon (spring-run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-64: Effects of methylmercury management on Chinook salmon (spring-run ESU) (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-67: Effects of localized reduction of predatory fish on Chinook salmon (spring-run ESU) (CM15)	2D, 4, 4A, 5A	NI		NI	NE
AQUA-68: Effects of nonphysical fish barriers on Chinook salmon (spring-run ESU) (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-73: Effects of construction of water conveyance facilities on Chinook salmon (fall- and late fall–run ESU)	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-74: Effects of maintenance of water conveyance facilities on Chinook salmon (fall- and late fall–run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-75: Effects of water operations on entrainment of Chinook salmon (fall-/late fall–run ESU)	4, 4A, 5A	LTS		LTS	NA
	2D	B		B	NA
	5A	B		B	B
AQUA-76: Effects of water operations on spawning and egg incubation habitat for Chinook salmon (fall- and late fall–run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-77: Effects of water operations on rearing habitat for Chinook salmon (fall-/late fall–run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-78: Effects of water operations on migration conditions for Chinook salmon (fall-/late fall–run ESU)	4, 4A	S	AQUA-78D: Slightly adjust the timing and magnitude of Shasta, Folsom, and/or Oroville Reservoir releases, within all existing regulations and requirements, to ameliorate changes in instream, slows that would cause an adverse effect to fall-run Chinook salmon	LTS	NA
	2D, 5A	S	AQUA-78a: Following initial operations of water conveyance facilities, conduct additional evaluation and modeling of impacts to fall-/late fall–run Chinook salmon to determine feasibility of mitigation to reduce impacts to migration conditions AQUA-78b: Conduct additional evaluation and modeling of impacts on fall-/late fall–run Chinook salmon migration conditions following initial operations of water conveyance facilities AQUA-78c: Consult with NMFS and CDFW to identify and implement potentially feasible means to minimize effects on fall-/late fall–run Chinook salmon migration conditions consistent with water conveyance facility operations	S	A
	7	LTS		LTS	NA
AQUA-79: Effects of construction of restoration measures on Chinook salmon (fall-/late fall–run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-80: Effects of contaminants associated with restoration measures on Chinook salmon (fall-/late fall–run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-81: Effects of restored habitat conditions on Chinook salmon (fall-/late fall–run ESU)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-82: Effects of methylmercury management on Chinook salmon (fall-/late fall–run ESU) (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-85: Effects of localized reduction of predatory fish on Chinook salmon (fall-/late fall–run ESU) (CM15)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-86: Effects of nonphysical fish barriers on Chinook salmon (fall-/late fall–run ESU) (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-91: Effects of construction of water conveyance facilities on steelhead	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-92: Effects of maintenance of water conveyance facilities on steelhead	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-93: Effects of water operations on entrainment of steelhead	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-94: Effects of water operations on spawning and egg incubation habitat for steelhead	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-95: Effects of water operations on rearing habitat for steelhead	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-96: Effects of water operations on migration conditions for steelhead	3, 4, 5, 7, 4A, 5A	LTS		LTS	NA
	2D	S	AQUA-96a: Following initial operations of water conveyance facilities, conduct additional evaluation and modeling of impacts to steelhead to determine feasibility of mitigation to reduce impact to migration conditions AQUA-96b: Conduct additional evaluation and modeling of impacts on steelhead migration conditions following initial operations of water conveyance facilities AQUA-96c: Consult with NMFS and CDFW to identify and implement potentially feasible means to minimize effects on steelhead migration conditions consistent with water conveyance facility operations	S	A
AQUA-97: Effects of construction of restoration measures on steelhead	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-98: Effects of contaminants associated with restoration measures on steelhead	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 6A, 6B, 6C, 8, 9, 2D, 4A, 5A	LTS		LTS	NA
AQUA-99: Effects of restored habitat conditions on steelhead	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-100: Effects of methylmercury management on steelhead (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-103: Effects of localized reduction of predatory fish on steelhead (CM15)	2D, 4, 4A, 5A	LTS		LTS	NE
AQUA-104: Effects of nonphysical fish barriers on steelhead (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-109: Effects of construction of water conveyance facilities on Sacramento splittail	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-110: Effects of maintenance of water conveyance facilities on Sacramento splittail	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-111: Effects of water operations on entrainment of Sacramento splittail	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-112: Effects of water operations on spawning and egg incubation habitat for Sacramento splittail	2D, 4, 4A, 5A	B		B	NE
AQUA-113: Effects of water operations on rearing habitat for Sacramento splittail	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-114: Effects of water operations on migration conditions for Sacramento splittail	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-115: Effects of construction of restoration measures on Sacramento splittail	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-116: Effects of contaminants associated with restoration measures on Sacramento splittail	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-117: Effects of restored habitat conditions on Sacramento splittail	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-118: Effects of methylmercury management on Sacramento splittail (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-121: Effects of localized reduction of predatory fish on Sacramento splittail (CM15)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-122: Effects of nonphysical fish barriers on Sacramento splittail (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-127: Effects of construction of water conveyance facilities on green sturgeon	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-128: Effects of maintenance of water conveyance facilities on green sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-129: Effects of water operations on entrainment of green sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-130: Effects of water operations on spawning and egg incubation habitat for green sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-131: Effects of water operation on rearing habitat for green sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-132: Effects of water operations on migration conditions for green sturgeon	4, 5, 6A, 6B, 6C, 7, 9, 2A, 2D, 4A, 5A	LTS		LTS	NA
AQUA-133: Effects of construction of restoration measures on green sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-134: Effects of contaminants associated with restoration measures on green sturgeon	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4A, 5A	LTS		LTS	NA
AQUA-135: Effects of restored habitat conditions on green sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-136: Effects of methylmercury management on green sturgeon (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-139: Effects of localized reduction of predatory fish on green sturgeon (CM15)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-140: Effects of nonphysical fish barriers on green sturgeon (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-145: Effects of construction of water conveyance facilities on white sturgeon	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-146: Effects of maintenance of water conveyance facilities on white sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-147: Effects of water operations on entrainment of white sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-148: Effects of water operations on spawning and egg incubation habitat for white sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-149: Effects of water operations on rearing habitat for white sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-150: Effects of water operations on migration conditions for white sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-151: Effects of construction of restoration measures on white sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-152: Effects of contaminants associated with restoration measures on white sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-153: Effects of restored habitat conditions on white sturgeon	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-154: Effects of methylmercury management on white sturgeon (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-157: Effects of localized reduction of predatory fish on white sturgeon (CM15)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-158: Effects of nonphysical fish barriers on white sturgeon (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-163: Effects of construction of water conveyance facilities on Pacific lamprey	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-164: Effects of maintenance of water conveyance facilities on Pacific lamprey	2D, 4, 4A, 5A	LTS		LTS	NA

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NA=not adverse
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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-165: Effects of water operations on entrainment of Pacific lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-166: Effects of water operations on spawning and egg incubation habitat for Pacific lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-167: Effects of water operations on rearing habitat for Pacific lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-168: Effects of water operations on migration conditions for Pacific lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-169: Effects of construction of restoration measures on Pacific lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-170: Effects of contaminants associated with restoration measures on Pacific lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-171: Effects of restored habitat conditions on Pacific lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-172: Effects of methylmercury management on Pacific lamprey (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-175: Effects of localized reduction of predatory fish on Pacific lamprey (CM15)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-176: Effects of nonphysical fish barriers on Pacific lamprey (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-181: Effects of construction of water conveyance facilities on river lamprey	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-182: Effects of maintenance of water conveyance facilities on river lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-183: Effects of water operations on entrainment of river lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-184: Effects of water operations on spawning and egg incubation habitat for river lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-185: Effects of water operations on rearing habitat for river lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-186: Effects of water operations-related decline on migration conditions for river lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-187: Effects of construction of restoration measures on river lamprey	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-188: Effects of contaminants associated with restoration measures on river lamprey	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-189: Effects of restored habitat conditions on river lamprey	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-190: Effects of methylmercury management on river lamprey (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-193: Effects of localized reduction of predatory fish on river lamprey (CM15)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-194: Effects of nonphysical fish barriers on river lamprey (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-199: Effects of construction of water conveyance facilities on non-covered aquatic species of primary management concern	2D, 4, 4A, 5A	S (noise associated with pile driving)	AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Monitor underwater noise and if necessary, use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
AQUA-200: Effects of maintenance of water conveyance facilities on non-covered aquatic species of primary management concern	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-201: Effects of water operations on entrainment of non-covered aquatic species of primary management concern	2D, 4, 4A, 5A	S (striped bass, American shad) LTS (threadfin shad, largemouth bass, Sacramento tule perch, Sacramento San-Joaquin roach, hardhead, and California bay shrimp)		S (striped bass, American shad) LTS (threadfin shad, largemouth bass, Sacramento tule perch, Sacramento San-Joaquin roach, hardhead, and California bay shrimp)	NA (striped bass, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento San-Joaquin roach, hardhead, and California bay shrimp) A (American shad)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8	S (striped bass, American shad)		S (striped bass, American shad)	A
	9	LTS		LTS	NA
AQUA-202: Effects of water operations on spawning and egg incubation habitat for non-covered aquatic species of primary management concern	2D, 4, 4A, 5A	LTS (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento-San Joaquin roach, hardhead, California bay shrimp)		LTS (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento-San Joaquin roach, hardhead, California bay shrimp)	NA (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento-San Joaquin roach, hardhead, California bay shrimp)

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQUA-203: Effects of water operations on rearing habitat for non-covered aquatic species of primary management concern	2D, 4, 4A, 5A	LTS (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento-San Joaquin roach, hardhead, California bay shrimp)		LTS (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento-San Joaquin roach, hardhead, California bay shrimp)	NA (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento-San Joaquin roach, hardhead, California bay shrimp)
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9	LTS (striped bass, American shad, California bay shrimp)		LTS (striped bass, American shad, California bay shrimp)	NA (striped bass, American shad, California bay shrimp)
AQUA-204: Effects of water operations on migration conditions for non-covered aquatic species of primary management concern	2D, 4, 4A, 5A	LTS (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento-San Joaquin roach, hardhead, California bay shrimp)		LTS (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento-San Joaquin roach, hardhead, California bay shrimp)	NA (striped bass, American shad, threadfin shad, largemouth bass, Sacramento tule perch, Sacramento-San Joaquin roach, hardhead, California bay shrimp)
AQUA-205: Effects of construction of restoration measures on non-covered aquatic species of primary management concern	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-206: Effects of contaminants associated with restoration measures on non-covered aquatic species of primary management concern	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-207: Effects of restored habitat conditions on non-covered aquatic species of primary management concern	2D, 4, 4A, 5A	B		B	NA
AQUA-208: Effects of methylmercury management on non-covered aquatic species of primary management concern (CM12)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-211: Effects of localized reduction of predatory fish on non-covered aquatic species of primary management concern (CM15)	2D, 4, 4A, 5A	LTS		LTS	NA
AQUA-212: Effects of nonphysical fish barriers on non-covered aquatic species of primary management concern (CM16)	2D, 4, 4A, 5A	LTS		LTS	NA (striped bass, American shad, threadfin shad, largemouth bass) NE (Sacramento-San Joaquin roach, hardhead, California bay shrimp)
AQUA-217: Effects of water operations on reservoir coldwater fish habitat	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Terrestrial Biological Resources					
BIO-1: Changes in tidal perennial aquatic natural community as a result of implementing BDCP conservation measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	B		B	B
BIO-2: Increased frequency, magnitude and duration of periodic inundation of tidal perennial aquatic natural community	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-3: Modification of tidal perennial aquatic natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		NI	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-4: Changes in tidal brackish emergent wetland natural community as a result of implementing BDCP Conservation Measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	B		B	B
BIO-5: Modification of tidal brackish emergent wetland natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-6: Changes in tidal freshwater emergent wetland natural community as a result of implementing BDCP Conservation Measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	LTS (short-term)/ B (long-term)		LTS (short-term)/ B (long-term)	NA (short term-term)/ B (long-term)
BIO-7: Increased frequency, magnitude and duration of periodic inundation of tidal freshwater emergent wetland natural community	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-8: Modification of tidal freshwater emergent wetland natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA

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		CEQA		CEQA	NEPA
BIO-9: Changes in valley/foothill riparian natural community as a result of implementing BDCP Conservation Measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	B		B	B
BIO-10: Increased frequency, magnitude and duration of periodic inundation of valley/foothill riparian natural community	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	B		B	B
BIO-11: Modification of valley/foothill riparian natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-12: Changes in nontidal perennial aquatic natural community as a result of implementing BDCP conservation measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	B		B	B
BIO-13: Increased frequency, magnitude and duration of periodic inundation of nontidal perennial aquatic natural community	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-14: Modification of nontidal perennial aquatic natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-15: Changes in nontidal freshwater perennial emergent wetland natural community as a result of implementing BDCP Conservation Measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	B		B	B
BIO-16: Increased frequency, magnitude and duration of periodic inundation of nontidal freshwater perennial emergent wetland natural community	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-17: Modification of nontidal freshwater perennial emergent wetland natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-18: Changes in alkali seasonal wetland complex natural community as a result of implementing BDCP Conservation Measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-19: Increased frequency, magnitude and duration of periodic inundation of alkali seasonal wetland complex natural community	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-20: Modification of alkali seasonal wetland complex natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-21: Changes in vernal pool complex natural community as a result of implementing BDCP Conservation Measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-22: Increased frequency, magnitude and duration of periodic inundation of vernal pool complex natural community	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-23: Modification of vernal pool complex natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-24: Changes in managed wetland natural community as a result of implementing BDCP Conservation Measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-25: Increased frequency, magnitude and duration of periodic inundation of managed wetland natural community	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-26: Modification of managed wetland natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-27: Modification of other natural seasonal wetland natural community as a result of implementing BDCP Conservation Measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA

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		CEQA		CEQA	NEPA
BIO-28: Modification of other natural seasonal wetland natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-29: Changes in grassland natural community as a result of implementing BDCP Conservation Measures	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-30: Increased frequency, magnitude and duration of periodic inundation of grassland natural community	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-31: Modification of grassland natural community from ongoing operation, maintenance and management activities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-32: Loss or conversion of habitat for and direct mortality of vernal pool crustaceans	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-33: Indirect effects of Plan implementation on vernal pool crustaceans	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-34: Periodic effects of inundation of vernal pool crustacean habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-35: Loss of valley elderberry longhorn beetle habitat	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-36: Indirect effects on valley elderberry longhorn beetle and its habitat	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-37: Periodic effects of inundation of valley elderberry longhorn beetle habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA

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		CEQA		CEQA	NEPA
BIO-38: Loss or conversion of habitat for and direct mortality of nonlisted vernal pool invertebrates	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-39: Indirect effects of Plan implementation on nonlisted vernal pool invertebrates	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-40: Periodic effects of inundation of nonlisted vernal pool invertebrates' habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-41: Loss or conversion of habitat for and direct mortality of Sacramento and Antioch Dunes anthicid beetles	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-42: Loss or conversion of habitat for and direct mortality of delta green ground beetle	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-42: Avoid impacts on delta green ground beetle and its habitat	LTS	NA
BIO-43: Loss or conversion of habitat for and direct mortality of Callippe silverspot butterfly	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-43: Avoid and minimize loss of Callippe silverspot butterfly habitat	LTS	NA
BIO-44: Loss or conversion of habitat for and direct mortality of California red-legged frog	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-45: Indirect effects of Plan implementation on California red-legged frog	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-46: Loss or conversion of habitat for and direct mortality of California tiger salamander	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-47: Indirect effects of Plan implementation on California tiger salamander	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA

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		CEQA		CEQA	NEPA
BIO-48: Periodic effects of inundation of California tiger salamander habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-49: Loss or conversion of habitat for and direct mortality of giant garter snake	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-50: Indirect effects of Plan implementation on giant garter snake	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-50a: Loss of connectivity among giant garter snakes in the Coldani Marsh/White Slough subpopulation, Stone Lakes National Wildlife Refuge, and the Delta	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-51: Periodic effects of inundation of giant garter snake habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-52: Loss or conversion of habitat for and direct mortality of western pond turtle	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-53: Indirect effects of Plan implementation on western pond turtle	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-54: Periodic effects of inundation of western pond turtle habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-55: Loss or conversion of habitat for and direct mortality of special-status reptiles	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-55: Conduct preconstruction surveys for noncovered special-status reptiles and implement applicable CM22 measures	LTS	NA

Level of Significance/Determination of Effects:

CEQA

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NEPA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-56: Indirect effects of Plan implementation on special-status reptile species	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-55: Conduct preconstruction surveys for noncovered special-status reptiles and implement applicable CM22 measures	LTS	NA
BIO-57: Loss or conversion of habitat for and direct mortality of California black rail	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-58: Effects on California black rail associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-59: Indirect effects of Plan implementation on California black rail	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-60: Fragmentation of California black rail habitat as a result of conservation component implementation	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-61: Periodic effects of inundation of California black rail habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-62: Loss or conversion of habitat for and direct mortality of California clapper rail	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-63: Indirect effects of Plan implementation on California clapper rail	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-64: Effects on California clapper rail associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-65: Fragmentation of California clapper rail habitat as a result of conservation component implementation	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-66: Loss or conversion of habitat for and direct mortality of California least tern	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-66: California least tern nesting colonies shall be avoided and indirect effects on colonies will be minimized	LTS	NA
BIO-67: Indirect effects of Plan implementation on California least tern	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-66: California least tern nesting colonies shall be avoided and indirect effects on colonies will be minimized	LTS	NA
BIO-68: Effects on California least tern associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-69: Loss or conversion of habitat for and direct mortality of greater sandhill crane	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	S	BIO-69a: Compensate for the loss of Medium to Very High-Value Greater Sandhill Crane Foraging Habitat	LTS	NA
BIO-70: Effects on greater sandhill crane associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-71: Indirect effects of Plan implementation on greater sandhill crane	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-72: Loss or conversion of habitat for and direct mortality of lesser sandhill crane	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	S	BIO-72: Compensate for the loss of medium- to over high-value lesser sandhill crane foraging habitat	LTS	NA
BIO-73: Effects on lesser sandhill crane associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-74: Indirect effects of Plan implementation on lesser sandhill crane	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-75: Loss or conversion of habitat for and direct mortality of least Bell's vireo and yellow warbler	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-76: Fragmentation of least Bell's vireo and yellow warbler habitat	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-77: Effects on least Bell's vireo and yellow warbler associated with electrical transmission facilities	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-78: Indirect effects of Plan implementation on least Bell's vireo and yellow warbler	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-79: Periodic effects of inundation of least Bell's vireo and yellow warbler habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	B		B	B
BIO-80: Loss or conversion of habitat for and direct mortality of Suisun song sparrow and saltmarsh common yellowthroat	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-81: Indirect effects of Plan implementation on Suisun song sparrow and saltmarsh common yellowthroat	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-82: Effects on Suisun song sparrow and saltmarsh common yellowthroat associated with electrical transmission facilities	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-83: Loss or conversion of habitat for and direct mortality of Swainson's hawk	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-84: Effects on Swainson's hawk associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-85: Indirect effects of Plan implementation on Swainson's hawk	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-86: Periodic effects of inundation of Swainson's hawk nesting and foraging habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-87: Loss or conversion of habitat for and direct mortality of tricolored blackbird	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-88: Effects on tricolored blackbird associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-89: Indirect effects of Plan implementation on tricolored blackbird	NAA	v		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-90: Periodic effects of inundation of tricolored blackbird habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-91: Loss or conversion of habitat for and direct mortality of western burrowing owl	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
	4	S	BIO-91: Compensate for near-term loss of high-value western burrowing owl habitat	LTS	NA
BIO-92: Effects on western burrowing owl associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-93: Indirect effects of Plan implementation on western burrowing owl	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-94: Periodic effects of inundation on western burrowing owl habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-95: Loss or conversion of habitat for and direct mortality of western yellow-billed cuckoo	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-96: Fragmentation of western yellow-billed cuckoo habitat as a result of constructing the water conveyance facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-97: Effects on western yellow-billed cuckoo associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-98: Indirect effects of Plan implementation on western yellow-billed cuckoo	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-99: Periodic effects of inundation of western yellow-billed cuckoo habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-100: Loss or conversion of habitat for and direct mortality of white-tailed kite	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-101: Effects on white-tailed kite associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-102: Indirect effects of Plan implementation on white-tailed kite	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-103: Periodic effects of inundation of white-tailed kite habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-104: Loss or conversion of habitat for and direct mortality of yellow-breasted chat	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-105: Fragmentation of yellow-breasted chat habitat as a result of constructing the water conveyance facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-106: Effects on yellow-breasted chat associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-107: Indirect effects of Plan implementation on yellow-breasted chat	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-108: Periodic effects of inundation of yellow-breasted chat habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	B		B	B
BIO-109: Loss or conversion of habitat for and direct mortality of Cooper's hawk and osprey	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-110: Effects on Cooper's hawk and osprey associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-111: Indirect effects of Plan implementation on Cooper's hawk and osprey	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-112: Periodic effects of inundation of Cooper's hawk and osprey nesting habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-113: Loss or conversion of habitat for and direct mortality of golden eagle and ferruginous hawk	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	S	BIO-113: Compensate for the near-term loss of golden eagle and ferruginous hawk foraging habitat	LTS	NA
BIO-114: Effects on golden eagle and ferruginous hawk associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-115: Indirect effects of Plan implementation on golden eagle and ferruginous hawk	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-116: Periodic effects of inundation on golden eagle and ferruginous hawk habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-117: Loss or conversion of nesting habitat for and direct mortality of cormorants, herons and egrets	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-117: Avoid impacts on rookeries	LTS	NA
BIO-118: Effects associated with electrical transmission facilities on cormorants, herons and egrets	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-119: Indirect effects of Plan implementation on cormorants, herons and egrets	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-117: Avoid impacts on rookeries	LTS	NA
BIO-120: Periodic effects of inundation on cormorants, herons and egrets as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-121: Loss or conversion of habitat for short-eared owl and northern harrier	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-122: Effects on short-eared owl and northern harrier associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-123: Indirect effects of Plan implementation on short-eared owl and northern harrier	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-124: Periodic effects of inundation on short-eared owl and northern harrier as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-125: Loss or conversion of habitat for and direct mortality of mountain plover	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	S	BIO-125: Compensate for the near-term loss of mountain plover wintering habitat	LTS	NA
BIO-126: Effects on mountain plover associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-127: Indirect effects of Plan implementation on mountain plover	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-128: Periodic effects of inundation on mountain plover as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-129a: Loss or conversion of habitat for and direct mortality of black tern	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-129a: Compensate for loss of black tern nesting habitat (short-term)	LTS	NA
BIO-129b: Indirect effects of Plan implementation on black tern	NAA	B (short-term)// SS (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-129c: Periodic effects of inundation on black tern nesting habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-130: Loss or conversion of habitat for and direct mortality of California horned lark and grasshopper sparrow	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
	4	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-130: Compensate for near-term loss of California horned lark and grasshopper sparrow habitat	LTS	NA
BIO-131: Effects on California horned lark and grasshopper sparrow and associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-132: Indirect effects of Plan implementation on grasshopper sparrow and California horned lark	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-133: Periodic effects of inundation on California horned lark and grasshopper sparrow as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
BIO-134: Loss or conversion of habitat for and direct mortality of least bittern and white-faced ibis	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-135: Effects on least bittern and white-faced ibis associated with electrical transmission facilities	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-136: Indirect effects of Plan implementation on least bittern and white-faced ibis	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-137: Periodic effects of inundation on least bittern and white-faced ibis as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-138: Loss or conversion of modeled habitat for and direct mortality of loggerhead shrike	NAA	B (short-term)/ S (long-term)		B (short-term)v/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
	4	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds BIO-138: Compensate for the near-term loss of high-value loggerhead shrike habitat	LTS	NA
BIO-139: Effects on loggerhead shrike associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-140: Indirect effects of Plan implementation on loggerhead shrike	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-141: Periodic effects of inundation on loggerhead shrike as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-142: Loss or conversion of habitat for and direct mortality of Modesto song sparrow	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA

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		CEQA		CEQA	NEPA
BIO-143: Effects on Modesto song sparrow associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-144: Indirect effects of Plan implementation on Modesto song sparrow	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-145: Periodic effects of inundation on Modesto song sparrow as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-146: Indirect effects of implementation of conservation components on bank swallow	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-146: Active bank swallow colonies shall be avoided and indirect effects on bank swallow will be minimized	LTS	NA
BIO-147: Effects of upstream reservoir and water conveyance facility operations on bank swallow	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-147: Monitor bank swallow colonies and evaluate winter and spring flows upstream of the study area	LTS	NA
BIO-148: Loss of habitat for and direct mortality of yellow-headed blackbird	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-149: Effects on yellow-headed blackbird associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-150: Indirect effects of Plan implementation on yellow-headed blackbird	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-151: Periodic effects of inundation of yellow-headed blackbird nesting habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-152: Loss or conversion of habitat for and direct mortality of riparian brush rabbit	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)

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		CEQA		CEQA	NEPA
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-153: Indirect effects of Plan implementation on riparian brush rabbit	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-154: Periodic effects of inundation of riparian brush rabbit habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-155: Loss or conversion of habitat for and direct mortality of riparian woodrat	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-156: Indirect effects of Plan implementation on riparian woodrat	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-157: Periodic effects of inundation of riparian woodrat habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-158: Loss or conversion of habitat for and direct mortality of salt marsh harvest mouse	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-159: Indirect effects of Plan implementation on salt marsh harvest mouse	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-160: Loss or conversion of habitat for and direct mortality of Suisun shrew	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA

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		CEQA		CEQA	NEPA
BIO-161: Indirect effects of Plan implementation on Suisun shrew	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	LTS		LTS	NA
BIO-162: Loss or conversion of habitat for and direct mortality of San Joaquin kit fox and American badger	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-162: Conduct preconstruction survey for American badger	LTS	NA
BIO-163: Indirect effects of Plan implementation on San Joaquin kit fox and American badger	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-162: Conduct preconstruction survey for American badger	LTS	NA
BIO-164: Loss or conversion of habitat for and direct mortality of San Joaquin pocket mouse	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-165: Indirect effects of Plan implementation on San Joaquin pocket mouse	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-166: Loss or conversion of habitat for and direct mortality of special-status bats	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-166: Conduct preconstruction surveys for roosting bats and implement protective measures	LTS	NA
BIO-167: Indirect effects of Plan implementation on special-status bats	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-166: Conduct preconstruction surveys for roosting bats and implement protective measures	LTS	NA
BIO-168: Periodic effects of inundation of special-status bat habitat as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NE
	4	S	BIO-166: Conduct preconstruction surveys for roosting bats and implement protective measures	LTS	NA
BIO-169: Effects on habitat and populations of vernal pool plants	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-170: Effects on habitat and populations of alkali seasonal wetland plants	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-170: Avoid, minimize, or compensate for impacts on noncovered special-status plant species	LTS	NA

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		CEQA		CEQA	NEPA
BIO-171: Effects on habitat and populations of grassland plant species	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NA
	4	LTS		LTS	NA
BIO-172: Effects on habitat and populations of valley/foothill riparian plants	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	NI		NI	NA
	4	LTS		LTS	NA
BIO-173: Effects on habitat and populations of tidal wetland plants	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	S	BIO-170: Avoid, minimize, or compensate for impacts on noncovered special-status plant species	LTS	NA
BIO-174: Effects on habitat and populations of inland dune plants	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	NI		NI	NE
BIO-175: Effects on habitat and populations of nontidal wetland plants	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-170: Avoid, minimize, or compensate for impacts on noncovered special-status plant species	LTS	NA
BIO-176: Effects of constructing water conveyance facilities (CM1) on wetlands and other waters of the United States	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	4, 2D, 4A, 5A	S	BIO-176: Compensatory Mitigation for Fill of Waters of the U.S.	LTS	NA
BIO-177: Effects of implementing other conservation measures (CM2–CM10) on wetlands and other waters of the United States	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4A, 5A	LTS		LTS	NA
	4	B		B	B
BIO-178: Loss or conversion of habitat for waterfowl and shorebirds as a result of water conveyance facilities construction	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA

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BIO-179: Loss or conversion of habitat for wintering waterfowl as a result of implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-179a: Conduct food studies and monitoring for wintering waterfowl in Suisun Marsh BIO-179b: Conduct food studies and monitoring to demonstrate food quality of palustrine tidal wetlands in the Yolo and Delta Basins	LTS	NA
BIO-180: Loss or conversion of habitat for breeding waterfowl from implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-180: Conduct food and monitoring studies of breeding waterfowl in Suisun Marsh	LTS	NA
BIO-181: Loss or conversion of habitat for shorebirds from implementation of conservation components	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-182: Effects on shorebirds and waterfowl associated with electrical transmission facilities	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-183: Indirect effects of Plan implementation on shorebirds and waterfowl	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds	LTS	NA
BIO-184: Effects on habitat and populations of common wildlife and plants	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-185: Effect of BDCP Conservation Measures on wildlife corridors	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-186: Effects on natural communities resulting from the introduction and spread of invasive plant species	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	LTS		LTS	NA
BIO-187: Compatibility of the proposed water conveyance facilities and other Conservation Measures with federal, state, or local laws, plans, policies, or executive orders addressing terrestrial biological resources in the study area	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	NI		NI	NE

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		CEQA		CEQA	NEPA
Land Use					
LU-1: Incompatibility with applicable land use designations, goals, and policies as a result of constructing the proposed water conveyance facility (CM1)	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	NI		NI	NE
LU-2: Conflicts with existing land uses as a result of constructing the proposed water conveyance facility (CM1)	NAA, 2D, 4, 4A, 5A	NI		NI	A
LU-3: Create physical structures adjacent to and through a portion of an existing community as a result of constructing the proposed water conveyance facility (CM1)	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments	SU	A
LU-4: Incompatibility with applicable land use designations, goals and policies as a result of implementing the proposed Conservation Measures 2–21	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	4	NI		NI	NE
	2D, 4A, 5A	LTS		LTS	NA
LU-5: Conflicts with existing land uses as a result of implementing the proposed Conservation Measures 2–21	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	4	NI		NI	A
	2D, 4A, 5A	LTS		LTS	NA
LU-6: Create physical structures adjacent to and through a portion of an existing community as a result of implementing the proposed Conservation Measures 2–21	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
Agricultural Resources					
AG-1: Temporary conversion, short-term conversion, and permanent conversion of Important Farmland or of farmland under Williamson Act contracts or in Farmland Security Zones as a result of constructing the proposed water conveyance facility.	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	SU	A

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AG-2: Other effects on agriculture as a result of constructing and operating the proposed water conveyance facility	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones GW-1: Maintain water supplies in areas affected by construction dewatering GW-5: Agricultural lands seepage minimization WQ-11: Avoid, minimize, or offset, as feasible, reduced water quality conditions	SU	A
AG-3: Temporary conversion, short-term conversion, and permanent conversion of Important Farmland or of land subject to Williamson Act contracts or in Farmland Security Zones as a result of implementing the proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	SU	A
AG-4: Other effects on agriculture as a result of implementing the proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21	NAA	B (short-term)/ S (long-term)		B (short-term)/ S (long-term)	B (short-term)/ A (long-term)
	2D, 4, 4A, 5A	S	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones GW-5: Agricultural lands seepage minimization	SU	A
Recreation					
REC-1: Permanent displacement of existing well-established public use or private commercial recreation facility available for public access as a result of the location of the proposed water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	LTS		LTS	NA
REC-2: Result in long-term reduction of recreation opportunities and experiences as a result of constructing the proposed water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	REC-2: Provide alternative bank fishing access sites BIO-75: Conduct preconstruction nesting bird surveys and avoid disturbance of nesting birds AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible	SU/LTS[9]	A/NA[13]

[9] Impacts and effects on recreation from constructing the intakes would be LTS and NA, respectively, following mitigation.

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
			AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan AES-4a: Limit construction to daylight hours within 0.25 mile of residents AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments NOI-1a: Employ noise-reducing construction practices during construction NOI-1b: Prior to construction, initiate a complaint/response tracking program		
REC-3: Result in long-term reduction of recreational navigation opportunities as a result of constructing the proposed water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	TRANS-1a: Implement site-specific construction traffic management plan	SU	A
REC-4: Result in long-term reduction of recreational fishing opportunities as a result of constructing the proposed water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	REC-2: Provide alternative bank fishing access sites AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise NOI-1a: Employ noise-reducing construction practices during construction	LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
			NOI-1b: Prior to construction, initiate a complaint/response tracking program AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan		
REC-5: Result in long-term reduction of recreational fishing opportunities as a result of the operation of the proposed water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
REC-6: Cause a change in reservoir or lake elevations resulting in substantial reductions in water-based recreation opportunities and experiences at north- and south-of-Delta reservoirs	NAA	LTS	LTS	NA	
	2D, 4, 4A, 5A	LTS (for north-and south-of-Delta reservoirs for all operational scenarios except for San Luis Reservoir) S (for Scenarios H2 and H4 for San Luis Reservoir)	REC-6: Provide a Temporary Alternative Boat Launch to Ensure Access to San Luis Reservoir	LTS	NA
REC-7: Result in long-term reduction in water-based recreation opportunities as a result of maintenance of the proposed water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
REC-8: Result in long-term reduction in land-based recreation opportunities as a result of maintenance of the proposed water conveyance facilities	NAA, 2D, 4, 4A, 5A	NI		NI	NE

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
REC-9: Result in long-term reduction in fishing opportunities as a result of implementing Conservation Measures 2–21	NAA	LTS		LTS	NA
	4	LTS	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments NOI-1a: Employ noise-reducing construction practices during construction NOI-1b: Prior to construction, initiate a complaint/response tracking program AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
	2D, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
REC-10: Result in long-term reduction in boating-related recreation opportunities as a result of implementing Conservation Measures 2–21	4	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments NOI-1a: Employ noise-reducing construction practices during construction NOI-1b: Prior to construction, initiate a complaint/response tracking program AQUA-1a: Minimize the use of impact pile driving to address effects of pile driving and other construction-related underwater noise AQUA-1b: Use an attenuation device to reduce effects of pile driving and other construction-related underwater noise	LTS	NA
	NAA, 2D, 4A, 5A	LTS		LTS	NA
REC-11: Result in long-term reduction in upland recreational opportunities as a result of implementing Conservation Measures 2–21	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
REC-12: Compatibility of the proposed water conveyance facilities and other conservation measures with federal, state, or local plans, policies, or regulations addressing recreation resources	NAA, 2D, 4, 4A, 5A	NI		NI	NE
ECON-1: Temporary effects on regional economics and employment in the Delta region during construction of the proposed water conveyance facilities.	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	NI	A
ECON-2: Effects on population and housing in the Delta region during construction of the proposed water conveyance facilities.	NAA	NI		NI	NA
	4	LTS		LTS	LTS
	2D, 4A, 5A	NI		NI	NA
ECON-3: Changes in community character as a result of constructing the proposed water conveyance facilities.	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI		NI	A/B[10]
ECON-4: Changes in local government fiscal conditions as a result of constructing the proposed water conveyance facilities.	NAA, 2D, 4, 4A, 5A	NI		NI	NA
ECON-5: Effects on recreational economics as a result of constructing the proposed water conveyance facilities.	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI	Various mitigation measures introduced in the following chapters: Chapter 12, *Terrestrial Biological Resources;* Chapter 15, *Recreation*; Chapter 17, *Aesthetics and Visual Resources*; Chapter 19, *Transportation*; and Chapter 23, *Noise*.	NI	A
ECON-6: Effects on agricultural economics in the Delta region during construction of the proposed water conveyance facilities	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	NI	A
ECON-7: Permanent regional economic and employment effects in the Delta region during operation and maintenance of the proposed water conveyance facilities.	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	NI	A
ECON-8: Permanent effects on population and housing in the Delta region during operation and maintenance of the proposed water conveyance facilities	NAA, 2D, 4, 4A, 5A	NI		NI	NA

[10] While water conveyance construction could result in beneficial effects relating to the economic welfare of a community through additional regional employment and income, adverse social effects could also arise as a result of declining economic stability in communities closest to construction effects and in those most heavily influenced by agricultural and recreational activities.

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
ECON-9: Changes in community character during operation and maintenance of the proposed water conveyance facilities	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI	Various mitigation measures and environmental commitments related to noise, visual effects, transportation, agriculture and recreation would reduce adverse effects (See Appendix 3B, Environmental Commitments).	NI	A
ECON-10: Changes in local government fiscal conditions during operation and maintenance of the proposed water conveyance facilities.	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI		NI	A/B[11]
ECON-11: Effects on recreational economics during operation and maintenance of the proposed water conveyance facilities	2D, 4, 4A, 5A	NI		NI	NA
ECON-12: Permanent effects on agricultural economics in the Delta region during operation and maintenance of the proposed water conveyance facilities.	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	NI	A
ECON-13: Effects on the Delta region's economy and employment due to the implementation of the proposed Conservation Measures 2–22	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones MIN-5: Design Conservation Measures 4, 5, and 10 to avoid displacement of active natural gas wells to the extent feasible	NI	A/B[12]
ECON-14: Effects on population and housing in the Delta region as a result of implementing the proposed Conservation Measures 2–22	NAA, 2D, 4, 4A, 5A	NI		NI	NA
ECON-15: Changes in community character as a result of implementing the proposed Conservation Measures 2–22	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI	Various mitigation measures and environmental commitments related to transportation, agriculture, and recreation would be anticipated to reduce these adverse effects (See Appendix 3B).	NI	A
ECON-16: Changes in local government fiscal conditions as a result of implementing the proposed Conservation Measures 2–22	NAA, 2D, 4, 4A, 5A	NI		NI	NA

[11] A decrease in revenue as a result property tax and assessment revenue forgone as a result of the proposed water conveyance facilities could result in the loss of a substantial share of some agencies' tax bases, which would be considered an adverse effect. However, the BDCP proponents would make arrangements to compensate local governments for the loss of property tax or assessment revenue for land used for constructing, locating, operating, or mitigating for new Delta water conveyance facilities. Additionally, operation and maintenance of the water conveyance facilities would be anticipated to result in a net increase of income and employment in the Delta region. This would also create an indirect beneficial effect through increased sales tax revenue for local government entities that rely on sales taxes.

[12] Implementation of CMs 2–22 would result in an increase in construction and operation and maintenance-related employment and labor income, which would be considered a beneficial effect. However, there may also be a resulting decrease in agricultural-related and natural gas production-related employment and labor income as a result of implementing these conservation measures, which would be considered an adverse effect.

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
ECON-17: Effects on recreational economics as a result of implementing the proposed Conservation Measures 2–22	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI		NI	A/B[13]
ECON-18: Effects on agricultural economics in the Delta region as a result of implementing the proposed Conservation Measures 2–22	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI	AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to maintain agricultural productivity and mitigate for loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones	NI	A
ECON-19: Socioeconomic effects in the south-of-Delta hydrologic regions	NAA, 2D, 4, 4A, 5A	NI		NI	A/B[14]
Aesthetics and Visual Resources					
AES-1: Substantial alteration in existing visual quality or character during construction of conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan	SU	A

[13] Adverse effects would be primarily limited to areas close to restoration areas and during site preparation and earthwork phases. These effects could result in a decline in visits to the Delta and reduction in recreation-related spending, creating an adverse economic effect throughout the Delta. Beneficial recreational effects would generally result during later stages of the BDCP permit period as CM2–CM22 are implemented and environmental conditions supporting recreational activities are enhanced. These effects could improve the quality of recreational experiences, leading to increased economic activities related to recreation, particularly in areas where conservation measure implementation would create new recreational opportunities.

[14] If operation of water conveyance facilities under Alternative 6A reduced M&I deliveries to the extent that it would, in the long run, constrain population growth, its implementation could reinforce a socioeconomic status quo or limit potential economic and employment growth in hydrologic regions. Such changes to agricultural production and population growth with its associated economic activity could also lead to shifts in the character of communities in the hydrologic regions with resultant beneficial or adverse effects. Likewise, limited growth associated with reduced deliveries could require lower expenditures for local governments while also leading to reduced revenue.

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CEQA				NEPA		
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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AES-2: Permanent effects on a scenic vista from presence of conveyance facilities.	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1e: Apply aesthetic design treatments to all structures to the extent feasible	SU	A
AES-3: Permanent damage to scenic resources along a state scenic highway from construction of conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1e: Apply aesthetic design treatments to all structures to the extent feasible	SU	A
AES-4: Creation of a new source of light or glare that would adversely affect views in the area as a result of construction and operation of conveyance facilities.	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	AES-4a: Limit construction to daylight hours within 0.25 mile of residents AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences	SU	A
AES-5: Substantial alteration in existing visual quality or character during operation.	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	LTS		LTS	NA
AES-6: Substantial alteration in existing visual quality or character during construction of CM2–CM22.	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	AES-1a: Locate new transmission lines and access routes to minimize the removal of trees and shrubs and pruning needed to accommodate new transmission lines and underground transmission lines where feasible AES-1b: Install visual barriers between construction work areas and sensitive receptors AES-1c: Develop and implement a spoil/borrow and reusable tunnel material area management plan AES-1d: Restore barge unloading facility sites once decommissioned AES-1e: Apply aesthetic design treatments to all structures to the extent feasible	SU	A

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
			AES-1f: Locate concrete batch plants and fuel stations away from sensitive visual resources and receptors and restore sites upon removal of facilities AES-1g: Implement best management practices to implement project landscaping plan AES-4a: Limit construction to daylight hours within 0.25 mile of residents AES-4b: Minimize fugitive light from portable sources used for construction AES-4c: Install visual barriers along access routes, where necessary, to prevent light spill from truck headlights toward residences AES-6a: Underground new or relocated utility lines where feasible AES-6b: Develop and implement an afterhours low-intensity and lights off policy AES-6c: Implement a comprehensive visual resources management plan for the Delta and study area		
AES-7: Compatibility of the proposed water conveyance facilities and other conservation measures with federal, state, or local plans, policies, or regulations addressing aesthetics and visual resources	NAA	NI		NI	NA
	2D, 4, 4A, 5A	NI		NI	NE
Cultural Resources					
CUL-1: Effects on identified archaeological sites resulting from construction of conveyance facilities	NAA	S		SU	A
	2D, 4, 4A, 5A	S	CUL-1: Prepare a data recovery plan and perform data recovery excavations on the affected portion of the deposits of identified and significant archaeological sites	SU	A
CUL-2: Effects on archaeological sites to be identified through future inventory efforts	NAA	S		SU	A
	2D, 4, 4A, 5A	S	CUL-2: Conduct inventory, evaluation, and treatment of archaeological resources	SU	A
CUL-3: Effects on archaeological sites that may not be identified through inventory efforts	NAA	S		SU	A
	2D, 4, 4A, 5A	S	CUL-3: Implement an archaeological resources discovery plan, perform training of construction workers, and conduct construction monitoring	SU	A
CUL-4: Effects on buried human remains damaged during construction	NAA	S		SU	A
	2D, 4, 4A, 5A	S	CUL-4: Follow state and federal law governing human remains if such resources are discovered during construction	SU	A
CUL-5: Direct and indirect effects on eligible and potentially eligible historic architectural/built environment-resources resulting from construction activities	NAA	S		SU	A
	2D, 4, 4A, 5A	S	CUL-5: Consult with relevant parties, prepare and implement a built environment treatment plan	SU	A

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CEQA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
CUL-6: Direct and indirect effects on unidentified and unevaluated historic architectural/built environment resources resulting from construction activities	NAA	S		SU	A
	2D, 4, 4A, 5A	S	CUL-6: Conduct a survey of inaccessible properties to assess eligibility, determine if these properties will be adversely impacted by the project, and develop treatment to resolve or mitigate adverse impacts	SU	A
CUL-7: Effects of other Conservation Measures on cultural resources	NAA	S		SU	A
	2D, 4, 4A, 5A	S	CUL-7: Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with implementation of Conservation Measures 2–22	SU	A
CUL-8: Compatibility of the proposed water conveyance facilities and other Conservation Measures with plans and policies	NAA	NI		NI	NE
	2D, 4, 4A, 5A	NI		NI	NE
Transportation					
TRANS-1: Increased construction vehicle trips resulting in unacceptable LOS conditions	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments	SU[20]	A[21]
TRANS-2: Increased construction vehicle trips exacerbating unacceptable pavement conditions	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	TRANS-2a: Prohibit construction activity on physically deficient roadway segments TRANS-2b: Limit construction activity on physically deficient roadway segments TRANS-2c: Improve physical condition of affected roadway segments as stipulated in mitigation agreements or encroachment permits	SU[21]	A[22]
TRANS-3: Increase in safety hazards, including interference with emergency routes during construction	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments	SU[22]	A[23]
TRANS-4: Disruption of marine traffic during construction	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
TRANS-5: Disruption of rail traffic during construction.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A		TRANS-1a: Implement site-specific construction traffic management plan	LTS	NA
TRANS-6: Disruption of transit service during construction.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 2D, 4, 4A, 5A	S	TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments	SU	A
	9	S	TRANS-1a: Implement site-specific construction traffic management plan	LTS	NA
TRANS-7: Interference with bicycle routes during construction.	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	TRANS-1a: Implement site-specific construction traffic management plan	LTS	NA
TRANS-8: Increased traffic volumes and delays during operations and maintenance.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
TRANS-9: Permanent alteration of transportation patterns during operations and maintenance.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
TRANS-10: Increased traffic volumes during implementation of CM2–CM22	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	TRANS-1a: Implement site-specific construction traffic management plan TRANS-1b: Limit hours or amount of construction activity on congested roadway segments TRANS-1c: Make good faith efforts to enter into mitigation agreements to enhance capacity of congested roadway segments	SU[23, 24]	A[24, 25]
TRANS-11: Compatibility of the proposed water conveyance facilities and other conservation measures with plans and policies	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	NI		NI	NE
TRANS-12: Potential Effects on Navigation From Changes in Surface Water Elevations Caused by Construction of Water Conveyance Facilities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 4A, 2D, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
TRANS-13: Potential Effects of Navigation from Changes in Surface Elevations Caused by Operation of Intakes	NAA	NI		NI	NE
	4A	LTS	SW-4: Implement Measures to Reduce Runoff and Sedimentation	LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 5A	LTS		LTS	NA
TRANS-14: Potential Effects on Navigation Caused by Sedimentation From Construction of Intakes	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 4A, 2D, 5A	LTS	SW-4: Implement Measures to Reduce Runoff and Sedimentation	LTS	NA
TRANS-15: Potential Effects on Navigation Caused by Sedimentation From Construction of Barge Facilities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 4A, 2D, 5A	LTS	SW-4: Implement Measures to Reduce Runoff and Sedimentation	LTS	NA
TRANS-16: Potential Effects on Navigation Caused by Sedimentation From Construction of Clifton Court Forebay	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 4A, 2D, 5A	NI		NI	NE
TRANS-17: Potential Effects on Navigation Caused by Sedimentation From Operation of Intakes	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9, 4A, 2D, 5A	LTS	SW-4: Implement Measures to Reduce Runoff and Sedimentation	LTS	NA
TRANS-18: Potential Effects on Navigation From Construction and Operations of Head of Old River Barrier	NAA	NI		NI	NE
	4A, 2A, 2B, 2C, 3, 4, 2D	LTS		LTS	NA
	1A, 1B, 1C, 5, 6A, 6B, 6C, 7, 8, 9, 5A	NI		NI	NE
TRANS-19: Potential Cumulative Effects on Navigation From Construction and Operations of Water Conveyance Facilities	NAA	NI		NI	NE
	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 4A, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 5A	LTS		LTS	NA
Public Services and Utilities					
UT-1: Increased demand on law enforcement, fire protection, and emergency response services from new workers in the Plan Area as a result of constructing the proposed water conveyance facilities.	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
UT-2: Displacement of public service facilities as a result of constructing the proposed water conveyance facilities.	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
UT-3: Effects on public schools as a result of constructing the proposed water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
UT-4: Effects on water or wastewater treatment services and facilities as a result of constructing the proposed water conveyance facilities.	NAA. 2D, 4, 4A, 5A	LTS		LTS	NA
UT-5: Effects on landfills as a result of solid waste disposal needs during construction of the proposed water conveyance facilities.	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
UT-6: Effects on regional or local utilities as a result of constructing the proposed water conveyance facilities.	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	UT-6a: Verify locations of utility infrastructure UT-6b: Relocate utility infrastructure in a way that avoids or minimizes any effect on operational reliability UT-6c: Relocate utility infrastructure in a way that avoids or minimizes any effect on worker and public health and safety	SU[15]	A[16]
UT-7: Effects on public services and utilities as a result of operation and maintenance of the proposed water conveyance facilities.	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
UT-8: Effects on public services and utilities as a result of implementing the proposed CM2–CM11	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	UT-6a: Verify locations of utility infrastructure UT-6b: Relocate utility infrastructure in a way that avoids or minimizes any effect on operational reliability UT-6c: Relocate utility infrastructure in a way that avoids or minimizes any effect on worker and public health and safety	SU	NA
Energy					
ENG-1: Wasteful or inefficient energy use for temporary construction activities	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
ENG-2: Wasteful or inefficient energy use for pumping and conveyance	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
ENG-3: Compatibility of the proposed water conveyance facilities and CM2–CM22 with plans and policies	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	NI		NI	

[15] If coordination with all appropriate utility providers and local agencies to integrate with other construction projects and minimize disturbance to communities were successful under Mitigation Measure UT-6b, the impact would be less than significant (CEQA) and there would be no adverse effect (NEPA).

[16] If coordination with all appropriate utility providers and local agencies to integrate with other construction projects and minimize disturbance to communities were successful under Mitigation Measure UT-6b, the impact would be less than significant (CEQA) and there would be no adverse effect (NEPA).

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Air Quality and Greenhouse Gases					
AQ-1: Generation of criteria pollutants in excess of the SMAQMD regional thresholds during construction of the proposed water conveyance facility (previously AQ-1).	NAA	S		S	A
	1A, 1B, 2A, 2B, 6A, 6B, 2D	S (for ROG, NO_X, and PM10)	AQ-1a: Mitigate and offset construction-generated criteria pollutant emissions within the SFNA to net zero (0) for emissions in excess of general conformity *de minimis* thresholds (where Applicable) and to quantities below applicable CEQA thresholds for other pollutants AQ-1b: Develop an alternative or complementary offsite mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the SFNA to net zero (0) for emissions in excess of general conformity *de minimis* thresholds (where applicable) and to quantities below applicable CEQA thresholds for other pollutants	LTS	NA
	1C, 2C, 6C, 3, 7, 8	S (for ROG, NO_X)		LTS	NA
	4, 4A, 5, 5A	S (for NO_X)		LTS	NA
AQ-2: Generation of criteria pollutants in excess of the YSAQMD regional thresholds during construction of the proposed water conveyance facility (previously AQ-1).	NAA	S		S	A
	1A, 1B, 2A, 2B, 6A, 6B, 7, 8, 9, 2D	S (for ROG, NO_X, and PM10)	AQ-1a: Mitigate and offset construction-generated criteria pollutant emissions within the SFNA to net zero (0) for emissions in excess of general conformity *de minimis* thresholds (where Applicable) and to quantities below applicable CEQA thresholds for other pollutants AQ-1b: Develop an alternative or complementary offsite mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the SFNA to net zero (0) for emissions in excess of general conformity *de minimis* thresholds (where applicable) and to quantities below applicable CEQA thresholds for other pollutants	LTS	NA
	3	S (for PM10)		LTS	NA
	4, 4A, 5, 5A	LTS		LTS	NA
AQ-3: Generation of criteria pollutants in excess of the BAAQMD regional thresholds during construction of the proposed water conveyance facility.	NAA	S		S	A
	1A, 1B, 2A, 2B, 3, 5, 6A, 6B, 7, 8, 9, 2D, 4, 4A, 5A	S (for ROG and NO_X)	AQ-3a: Mitigate and offset construction-generated criteria pollutant emissions within BAAQMD/SFBAAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable BAAQMD CEQA thresholds for other pollutants AQ-3b: Develop an alternative or complementary off-site mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the BAAQMD/SFBAAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable BAAQMD CEQA thresholds for other pollutants	LTS	NA
	1C, 2C, 6C	S (for ROG and NO_X)		S (for ROG and NO_X)	A (for ROG and NO_X)

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQ-4: Generation of criteria pollutants in excess of the SJVAPCD regional thresholds during construction of the proposed water conveyance facility.	NAA	S		S	A
	1A, 1B, 2A, 2B, 2D, 3, 4, 4A, 5, 5A, 7, 8	S (for ROG, NO_X and PM10)	AQ-4a: Mitigate and offset construction-generated criteria pollutant emissions within SJVAPCD/SJVAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable SJVAPCD CEQA thresholds for other pollutants AQ-4b: Develop an alternative or complementary off-site mitigation program to mitigate and offset construction-generated criteria pollutant emissions within the SJVAPCD/SJVAB to net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and to quantities below applicable SJVAPCD CEQA thresholds for other pollutants	LTS	NA
	9	S (NO_X and PM10)		LTS	NA
	1C, 2C, 6C	LTS		LTS	NA
AQ-5: Generation of criteria pollutants in excess of the SMAQMD regional thresholds from operation and maintenance of the proposed water conveyance facility (previously AQ-6).	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-6: Generation of criteria pollutants in excess of the YSAQMD regional thresholds from operation and maintenance of the proposed water conveyance facility (previously AQ-5).	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-7: Generation of criteria pollutants in excess of the BAAQMD regional thresholds from operation and maintenance of the proposed water conveyance facility.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-8: Generation of criteria pollutants in excess of the SJVAPCD regional thresholds from operation and maintenance of the proposed water conveyance facility.	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds (new impact).	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10	LTS	NA
AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds (new impact).	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds (new impact)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds (new impact)	NAA	LTS		LTS	NA
	1A, 1B, 2A, 2B, 2D, 3, 5, 5A, 6A, 6B, 7, 8, 9	S	AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10	LTS	NA
	1C, 2C, 6C, 4, 4A	LTS		LTS	NA

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		CEQA		CEQA	NEPA
AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide (new impact)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds (previously Impact AQ-11)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds (previously impact AQ-10)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds (previously impact AQ-13)	1A, 1C, 2A, 2C, 2D, 3, 5, 5A, 6A, 6C, 7, 8	S (cancer risk)	AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk	SU (cancer risk)[17]	A (cancer risk)[38]
	NAA, 1B, 2B, 4, 4A, 6B, 9	LTS		LTS	NA
AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds (previously impact AQ-12)	1B, 2B, 6B	S (cancer risk)	AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk	SU (cancer risk)[18]	A (cancer risk)[39]
	NAA, 1A, 1C, 2A, 2C, 2D, 3, 4, 4A, 5, 5A, 6A, 6C, 7, 8, 9	LTS		LTS	NA
AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever) (new impact)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-19: Creation of Potential Odors Affecting a Substantial Number of People	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-20: Generation of Criteria Pollutants in the Excess of Federal De Minimis Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 2D, 3, 5, 5A, 6A, 6B, 6C, 7, 8, 9	S	AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity De Minimis Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity De Minimis Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants	SU	A
	4, 4A	S		LTS	NA

[17] Mitigation Measure AQ-16 would reduce exposure to substantial cancer risk by relocating affected receptors. The BDCP proponents cannot ensure that the affected landowners will accept DWR's offer for relocation assistance. If the landowners choose not to accept DWR's offer of relocation assistance, a significant impact in the form of exposure to substantial excess cancer risk would occur. Therefore, this impact would be significant and unavoidable. If, however, the landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

[18] Mitigation Measure AQ-16 would reduce exposure to substantial cancer risk by relocating affected receptors. The BDCP proponents cannot ensure that the affected landowners will accept DWR's offer for relocation assistance. If the landowners choose not to accept DWR's offer of relocation assistance, a significant impact in the form of exposure to substantial excess cancer risk would occur. Therefore, this impact would be significant and unavoidable. If, however, the landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
			AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity De Minimis Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity De Minimis Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity De Minimis Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity De Minimis Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants		
AQ-21: Generation of cumulative greenhouse gas emissions during construction of the proposed water conveyance facility (previously Impact AQ-15)	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	AQ-21: Develop and implement a GHG mitigation program to reduce construction related GHG emissions to net zero (0)	LTS	NA
AQ-22: Generation of cumulative greenhouse gas emissions from operation and maintenance of the proposed water conveyance facility and increased pumping (previously Impact AQ-16)	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-23: Generation of cumulative greenhouse gas emissions from increased CVP pumping as a result of implementation of CM1 (previously Impact AQ-17)	1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 4A, 5, 5A	S	No feasible mitigation to address this impact	SU	A
	NAA, 6A, 6B, 6C, 7, 8, 9	LTS		LTS	NA
AQ-24: Generation of regional criteria pollutants from implementation of CM2–CM11 (previously Impact AQ-18)	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to ensure air district regulations and recommended mitigation are incorporated into future conservation measures and associated project activities.	SU	A

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11 (new impact)	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to ensure air district regulations and recommended mitigation are incorporated into future conservation measures and associated project activities. AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations	LTS	NA
AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11	NAA, 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	LTS		LTS	NA
AQ-27: Generation of cumulative greenhouse gas emissions from implementation of CM2–CM11 (previously Impact AQ-19)	NAA	S		S	A
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to ensure air district regulations and recommended mitigation are incorporated into future conservation measures and associated project activities. AQ-27 Prepare a land use sequestration analysis to quantify and mitigate (as needed) GHG flux associated with conservation measures and associated project activities	SU	A
Noise					
NOI-1: Exposure of noise-sensitive land uses to noise from construction of water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	NOI-1a: Employ noise-reducing construction practices during construction. NOI-1b: Prior to construction, initiate a complaint/response tracking program.	SU	A
NOI-2: Exposure of sensitive receptors to vibration or groundborne noise from construction of water conveyance facilities	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 2D, 4, 4A, 5A	S	NOI-2: Employ vibration-reducing construction practices during construction of water conveyance facilities.	SU	A
	NAA, 9	LTS		LTS	NA
NOI-3: Exposure of noise-sensitive land uses to noise from operation of water conveyance facilities	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	NOI-3: Design and construct intake facilities and other pump facilities such that operational noise does not exceed 50 dBA (one-hour L_{eq}) during daytime hours (7:00 a.m. to 10:00 p.m.) or 45 dBA (one-hour L_{eq}) during nighttime hours (10:00 p.m. to 7:00 a.m.) or the applicable local noise standard (whichever is less) at nearby noise sensitive land uses.	LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
NOI-4: Exposure of noise-sensitive land uses to noise from implementation of proposed Conservation Measures 2–10	NAA	LTS		LTS	NA
	1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, 9, 2D, 4, 4A, 5A	S	NOI-1a: Employ noise-reducing construction practices during construction. NOI-1b: Prior to construction, initiate a complaint/response tracking program.	SU	A
Hazards and Hazardous Materials					
HAZ-1: Create a substantial hazard to the public or the environment through the release of hazardous materials or by other means during construction of the water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S		LTS	NA
HAZ-2: Expose sensitive receptors located within 0.25 miles of a construction site to hazardous materials, substances, or waste during construction of the water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
HAZ-3: Potential to conflict with a known hazardous materials site and, as a result, create a significant hazard to the public or the environment	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	NI		NI	NE
HAZ-4: Result in a safety hazard associated with an airport or private airstrip within 2 miles of the water conveyance facilities footprint for people residing or working in the study area during construction of the water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
HAZ-5: Expose people or structures to a substantial risk of property loss, personal injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands, as a result of construction, and operation and maintenance of the water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
HAZ-6: Create a substantial hazard to the public or the environment through the release of hazardous materials or by other means during operation and maintenance of the water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S		LTS	
HAZ-7: Create a substantial hazard to the public or the environment through the release of hazardous materials or by other means as a result of implementing Conservation Measures CM2–CM11, CM13, CM14, CM16 and CM18	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S		LTS	NA
HAZ-8: Increased risk of bird – aircraft strikes during implementation of conservation components that create or improve wildlife habitat	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S		SU	A

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Public Health					
PH-1: Increase in vector-borne diseases as a result of construction and operation of the intakes, solids lagoons, and/or sediment basins associated with the water conveyance facilities.	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
PH-2: Exceedances of water quality criteria for constituents of concern such that there is an adverse effect on public health as a result of operation of the water conveyance facilities.	NAA	LTS		LTS	NA
	4	S	WQ-5: Avoid, minimize, or offset, as feasible, adverse water quality conditions.	SU[19]	A[31]
	2D, 4A, 5A	LTS		LTS	NA
PH-3: Substantial mobilization or increase in constituents known to bioaccumulate as a result of construction, operation or maintenance of the water conveyance facilities.	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
PH-4: Expose substantially more people to transmission lines generating new sources of EMFs as a result of the operation of the water conveyance facilities.	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
PH-5: Increase in vector-borne diseases as a result of implementing CM2–CM7, CM10, and CM11	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
PH-6: Substantial increase in recreationists' exposure to pathogens as a result of implementing the restoration conservation measures	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
PH-7: Substantial mobilization of or increase in constituents known to bioaccumulate as a result of implementing CM2, CM4, CM5, and CM10	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
PH-8: Increase in Microcystis Bloom Formation as a Result of Operation of the Water Conveyance Facilities.	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	WQ-32a: Design Restoration Sites to Reduce Potential for Increased Microcystis Blooms. WQ-32b: Investigate and Implement Operational Measures to Manage Water Residence Time.	SU	A
PH-9: Increase in Microcystis Bloom Formation as a Result of Implementing CM2 and CM4.	4	S	WQ-32a: Design Restoration Sites to Reduce Potential for Increased Microcystis Blooms. WQ-32b: Investigate and Implement Operational Measures to Manage Water Residence Time.	SU	A
PH-9: Increase in *Microcystis* Bloom Formation as a Result of Implementing Environmental Commitment 4	NAA, 2D, 4A, 5A	LTS		LTS	NA

[19] This impact/effect would be less than significant/not adverse if all financial contributions, technical contributions, or partnerships required to avoid significant impacts prove feasible and any necessary agreements are completed before the project's contribution to the effect.

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Mineral Resources					
MIN-1: Loss of availability of locally important natural gas wells as a result of constructing the water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	NI		NI	NA
MIN-2: Loss of availability of extraction potential from natural gas fields as a result of constructing the water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
MIN-3: Loss of availability of locally important natural gas wells as a result of operation and maintenance of the water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	NI		NI	NA
MIN-4: Loss of availability of natural gas fields as a result of operation and maintenance of the water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	NI		NI	NA
MIN-5: Loss of availability of locally important natural gas wells as a result of implementing Conservation Measures 2–22	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	MIN-5: Design CM4, CM5, and CM10 to avoid displacement of active natural gas wells to the extent feasible	SU	A
MIN-6: Loss of availability of extraction potential from natural gas fields as a result of implementing Conservation Measures 2–22	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	S	MIN-6: Design CM4, CM5, and CM10 to maintain drilling access to natural gas fields to the extent feasible	SU	A
MIN-7: Loss of availability of locally important aggregate resource sites (mines and MRZs) as a result of constructing the water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	NI		NI	NE
MIN-8: Loss of availability of known aggregate resources as a result of constructing the proposed water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
MIN-9: Loss of availability of locally important aggregate resource sites (mines and MRZs) as a result of operation and maintenance of the water conveyance facilities	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	NI		NI	NE
MIN-10: Loss of availability of known aggregate resources as a result of operation and maintenance of the water conveyance facilities	NAA, 2D, 4, 4A, 5A	LTS		LTS	NA
MIN-11: Loss of availability of locally important aggregate resource sites (mines and MRZs) as a result of implementing Conservation Measures 2–22	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	LTS	MIN-11: Purchase affected aggregate materials for use in BDCP construction	LTS	NA
MIN-12: Loss of availability of known aggregate resources as a result of implementing Conservation Measures 2–22	NAA	LTS		LTS	NA
	2D, 4, 4A, 5A	LTS		LTS	NA

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Potential Impact	Alternatives	Impact Conclusions Before Mitigation	Proposed Mitigation (CEQA and NEPA)	Impact After Mitigation	
		CEQA		CEQA	NEPA
Paleontological Resources					
PALEO-1: Destruction of unique or significant paleontological resources as a result of construction of water conveyance facilities.	NAA	S		S	A
	2D, 4, 4A, 5A	S	PALEO-1a: Prepare a monitoring and mitigation plan for paleontological resources PALEO-1b: Review 90% design submittal and develop specific language identifying how the mitigation measures will be implemented along the alignment PALEO-1c: Educate construction personnel in recognizing fossil material PALEO-1d: Collect and preserve substantial potentially unique or significant fossil remains when encountered	SU	A
PALEO-2: Destruction of unique or significant paleontological resources associated with the implementation of other conservation measures.	NAA	S		S	A
	2D, 4, 4A, 5A	S	PALEO-1a: Prepare a monitoring and mitigation plan for paleontological resources PALEO-1b: Review 90% design submittal and develop specific language identifying how the mitigation measures will be implemented along the alignment PALEO-1c: Educate construction personnel in recognizing fossil material PALEO-1d: Collect and preserve substantial potentially unique or significant fossil remains when encountered	LTS	NA

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Section 1
Introduction

1.1 Background and Context for the RDEIR/SDEIS

The Sacramento–San Joaquin Delta (Delta), shown in Figure 1-1, is a vitally important ecosystem that is home to hundreds of aquatic and terrestrial species, many of which are endemic to the area and a number of which are threatened or endangered, as identified by the California Endangered Species Act (CESA) and the federal Endangered Species Act (ESA). The watersheds of the Sacramento and San Joaquin Rivers are at the core of California's water system, which conveys water to millions of Californians throughout the San Francisco Bay Area (Bay Area), the Central Valley, and southern California. Water conveyed through the Delta supports farms and ranches from the north Delta to the Mexican border that are a source of financial stability for the state and that produce roughly half the nation's domestically grown fresh produce. These watersheds capture runoff from approximately 40% of the land in California (Department of Water Resources 2009). That water is used in the Delta, the Sacramento River watershed, the San Joaquin River watershed, the San Francisco Bay Area, the central coast region, and Southern California.

The Delta region is a key recreational destination. Its waterways and managed wetlands support many activities including fishing, boating, and hunting. It sustains distinctive geographical and cultural characteristics and supports extensive infrastructure of statewide importance, such as aqueducts, natural gas pipelines, and electricity transmission lines; railroads, commercial navigation (ports and shipping channels), and recreational navigation (marinas, docks, launch ramps); agricultural production and distribution; wildlife refuges; public and private levee systems; and highways. The Delta contains the largest natural gas production field in California, as well as California's largest natural gas storage facility (below McDonald Island in the central Delta), producing 20% of California's natural gas–powered electricity. Major electricity transmission lines in the Delta interconnect California with the Pacific Northwest and carry roughly 10% of the state's summer electricity load. Gasoline and aviation fuel pipelines crossing the Delta supply large portions of northern California and Nevada. The ports of Stockton and Sacramento are focal points of regional economic development and rely on through-Delta shipping channels. State Route (SR) 12, SR 4, and through-Delta railways are also important links in the Delta transportation system (Delta Protection Commission 2011).

Regarding long-standing conflicts over how best to use and conserve its water and biological resources, the Delta remains a center of controversy. Several fish species, including delta smelt (*Hypomesus transpacificus*) and winter-run Chinook salmon (*Oncorhynchus tshawytscha*), are listed under the ESA and CESA and have recently experienced the lowest population numbers in their recorded history; levees and the Delta infrastructure they protect are at risk from earthquake damage, continuing land subsidence, and rising sea level. The biological opinions (BiOps) that U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) issued significantly changed the manner in which the Central Valley Project (CVP) and State Water Project (SWP) operate, influencing the amounts of water conveyed through the south Delta. USFWS issued the current Biological Opinion on the Coordinated Long Term Operation of the CVP and SWP on December 15, 2008. NMFS issued its BiOp on Long-Term Operation of the Central Valley Project and State Water Project on June 4, 2009. The BiOps called for changes in water pumping operations to

avoid jeopardizing the continued existence of delta smelt (issued by USFWS) and winter and spring-run Chinook salmon, Central Valley steelhead (*Oncorhynchus mykiss*), the southern population of North American green sturgeon (*Acipenser medirostris*), and southern resident killer whales (*Orcinus orca*) (issued by NMFS), and to avoid adverse modification or destruction of designated critical habitat. Operational changes are tied to water year type, and exceptions are provided for drought and health and safety issues.

The California Department of Water Resources (DWR), in coordination with the U.S. Bureau of Reclamation (Reclamation), and several state and federal water contractors proposed to implement a comprehensive strategy to advance the planning goal of restoring ecological functions of the Delta and improving water supply reliability in the state of California. The initial approach focused on the development of a conservation plan, referred to as the Bay Delta Conservation Plan (BDCP), including modifications to the SWP to add intakes in the north Delta, and achieving compliance with the ESA through application of a permit from the USFWS and NMFS under Section 10 of the ESA and state endangered species laws through request for approval from the California Department of Fish and Wildlife (CDFW) under the California Natural Community Conservation Plan Act (NCCPA). DWR, acting as lead agency for compliance with the California Environmental Quality Act (CEQA), and Reclamation, USFWS, and NMFS, acting as lead agencies for compliance with the National Environmental Policy Act (NEPA), in December 2013 released a joint draft environmental impact report/environmental impact statement (EIR/EIS) to analyze and disclose the potential environmental effects associated with the alternatives to achieving the goals of restoring the ecological functions of the Delta and improving water supply reliability, and to identify potentially feasible ways to avoid, minimize, or mitigate adverse effects.

DWR and Reclamation, as state and federal lead agencies (Lead Agencies) under CEQA and NEPA, respectively, are issuing this Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft EIR/Supplemental Draft EIS (RDEIR/SDEIS) for the BDCP Draft EIR/EIS. The primary purposes of the RDEIR/SDEIS are to provide the public and interested agencies with updated environmental analysis to address certain revisions to the previously issued documents related to the BDCP and Draft EIR/EIS, to introduce new sub-alternatives (Alternative 4A, 2D, and 5A), and to address certain issues raised in comments received on the Draft EIR/EIS. The California WaterFix[1] (Alternative 4A), which has been developed in response to public and agency input, is the new CEQA Preferred Alternative, replacing Alternative 4 (the proposed BDCP). Alternative 4A is also the NEPA Preferred Alternative, a designation that was not attached to any of the alternatives presented in the BDCP Draft EIR/EIS.

The RDEIR/SDEIS considers project revisions that were developed in response to input from the Draft EIR/EIS comment period (see below) as well as from agencies' comments regarding the challenges with meeting the standards required to issue long term assurances associated with compliance with Section 10 of the ESA and the NCCPA. These challenges related to the difficulties in assessing species status and issuing assurances over a 50 year period, in light of climate change, and accurately factoring in the benefits of long term conservation in contributing to the recovery of the species. There were also questions raised as to the ability to implement large-scale habitat restoration and an interest in exploring multiple regulatory approaches that could facilitate expeditious progress on Delta solutions. To address these concerns, and due to the desire to explore alternative regulatory approaches that could facilitate expeditious progress on Delta solutions, the

[1] Hereafter in this document and in associated documents, California WaterFix will be referred to as Alternative 4A.

Lead Agencies revised the proposed project to allow for an alternative implementation strategy for the new alternatives in this RDEIR/SDEIS. The alternative implementation strategy relates to achieving the project goals and objectives, focusing on the conveyance facility improvements necessary for the SWP to address more immediate water supply reliability needs in conjunction with related ecosystem improvements, such as significantly reducing reverse flows and direct fish species impacts associated with the existing south Delta intakes. The alternative implementation strategy allows for other state and federal programs to address the long term conservation efforts for species recovery in programs separate from the proposed project. The alternative implementation strategy added three new alternatives to the RDEIR/SDEIS analysis. The alternatives in the Draft EIR/EIS are retained for the original conservation plan implementation strategy. If the Lead Agencies ultimately choose the alternative implementation strategy and select an alternative presented in the RDEIR/SDEIS after completing the CEQA and NEPA processes, elements of the conservation plan contained in the alternatives in the Draft EIR/EIS may be utilized by other programs for implementation of the long term conservation efforts.

The three alternatives, Alternatives 4A, 2D, and 5A are included to ensure that a reasonable range of alternatives are considered. These new alternatives are considered "sub-alternatives" to Draft EIR/EIS alternatives 4, 2A, and 5 because they generally adopt the same conveyance facility features as the original Draft EIR/EIS alternatives but with different operational characteristics. The new alternatives are not presented as habitat conservation /natural community conservation plans according to ESA Section 10 and the NCCPA. The proposed BDCP habitat restoration and stressor reduction measures (i.e., CM2 through CM21) that are presented in the Draft BDCP are not carried forward fully for new sub-alternatives 4A, 2D, and 5A, except where elements of the former conservation measures are retained to mitigate the potential impacts of the proposed project in compliance with CEQA, NEPA, and other environmental regulatory permitting requirements. Many of these original BDCP conservation measures may, however, be implemented through the California EcoRestore (EcoRestore) program[2]. The sub alternatives would achieve federal and state endangered species act compliance using a shorter duration through the "Section 7" process under the ESA, and the "Section 2081" process under the CESA.

This RDEIR/SDEIS will be circulated for an additional public review to disclose impacts and mitigation measures of the new alternatives and other changes. The original Draft BDCP and Draft EIR/EIS were released together for public review on December 13, 2013, for a 120-day public review period. The review period was extended in April 2014 for an additional 60 days. In June 2014, the Lead Agencies decided to further extend the review period to July 29, 2014, for a total review period of approximately 7½ months. During the latter portion of the extended public review period, the Lead Agencies issued a draft Implementation Agreement (IA) for a 60-day public review period to coincide with the last 60 days of the BDCP review period. The duration of the overall public review period reflected the Lead Agencies' desire to ensure that agencies, members of the public, and other entities had sufficient time in which to provide meaningful comments on all the draft documents, many of which were lengthy, reflecting the complexity of the issues involved.

Public comment received on the draft documents comprised a total of 12,204 comment letters—1,518 unique letters from individual members of the public and 432 letters from agencies, organizations, and stakeholder groups. The balance of responses consisted of form letters sent by individuals and organized by various organizations. A total of 18,532 separate comments on the

[2] https://s3.amazonaws.com/californiawater/pdfs/ECO_FS_Overview.pdf

draft documents were received during the public review period. All the comments were considered in the decision to circulate this RDEIR/SDEIS. Formal responses to the comments received on the Draft BDCP and Draft EIR/EIS, as well as comments received on this RDEIR/SDEIS, will be published in the Final EIR/EIS.

Subsequent to the commencement of the Draft BDCP and EIR/EIS review period, DWR also decided that certain portions of the proposed conservation strategy, including Conservation Measure (CM) 1 (water conveyance facilities), should be revised and modified to reduce environmental impacts, to increase the effectiveness of the proposed conservation strategy, and to improve the feasibility of conveyance facilities. The Lead Agencies determined that, in light of these changes and the importance of other substantive modifications made to the Draft EIR/EIS, members of the public and other interested agencies and entities should have a formal opportunity to review and comment on these revisions to the Draft EIR/EIS.

1.1.1 Addition of New Alternatives 4A, 2D, and 5A

As noted above, in response to public and agency comment, the Lead Agencies have decided to consider an alternative implementation strategy. Additional sub-alternatives for this alternative implementation strategy are presented in this RDEIR/SDEIS due to the desire to explore alternative regulatory approaches that could facilitate expeditious progress on Delta solutions. The new sub-alternatives incorporate an alternative implementation strategy to achieve the project goals and objectives, focusing on the conveyance facility improvements necessary for the SWP and CVP to address more immediate water supply reliability needs in conjunction with ecosystem improvements to significantly reduce reverse flows and direct fish species impacts associated with the existing south Delta intakes. The alternative implementation strategy allows for other state and federal programs to address the long term conservation efforts for species recovery in programs separate from the proposed project. Section 4*, New Alternatives: Alternative 4A, 2D, and 5A*, of this RDEIR/SDEIS provides a description of the new alternatives and presents analysis of their potential environmental effects.

As the CEQA and NEPA Preferred Alternative, Alternative 4A entails the construction and operation of north Delta intakes and associated tunnel conveyance facilities, and the operation of the SWP, as a dual conveyance facility consistent with those proposed under the updated Alternative 4, as identified in RDEIR/SDEIS Appendix A. Alternatives 2D and 5A, entail similar conveyance facilities as proposed under Alternatives 2A and 5 but with alignment and other improvements proposed under Alternatives 4 and 4A. Proposed facility operations and other actions reflect that revised approach: Alternatives 4A, 2D, and 5A do not include CM2 through CM21 as they are described for proposed BDCP alternatives. Compliance with the ESA would be achieved by Reclamation as the federal lead action agency under Section 7 of that act. Pursuant to the Coordinated Operations Agreement (COA), by which DWR and Reclamation coordinate their operations of the SWP and CVP, Reclamation, and DWR as the project applicant, would consult with both the USFWS and NMFS. This consultation also is intended to cover the U.S. Army Corps of Engineer's (USACE's) issuance of permits under the Clean Water Act (CWA) and Rivers and Harbors Act for the construction of the necessary diversion and conveyance facilities. Under the other action alternatives in the Draft EIR/EIS, in contrast, DWR would submit a Habitat Conservation Plan (HCP) in a request for a 50 year incidental take permit and appropriate assurances from the Services under ESA Section 10, while Reclamation would separately consult with USFWS and NMFS under Section 7. Compliance with state endangered species laws under Alternatives 4A, 2D, or 5A would be through a request for

authorization of the incidental take of species listed under the CESA in the form of an incidental take permit issued by CDFW under Section 2081(b) of the CESA. Under the original conservation plan implementation strategy represented by the other action alternatives in the Draft EIR/EIS, in contrast, DWR would submit a Natural Community Conservation Plan (NCCP) for a 50-year plan term under the NCCPA for approval by CDFW.

Because Alternative 4A now represents the preferred strategy being pursued by DWR and Reclamation, those two agencies remain Lead Agencies, while USFWS and NMFS have assumed roles as cooperating agencies for purposes of NEPA review of this RDEIR/SDEIS. The consultation and application processes with USFWS/NMFS and CDFW, respectively, will utilize, to the extent possible, analyses developed to date for the purposes of the BDCP, as updated, modified, and augmented to address attributes unique to the new alternatives. New information to address the potential change in the implementation strategy will also be incorporated.

When reviewed together with the Draft EIR/EIS, this RDEIR/SDEIS sufficiently describes and discloses the effects of implementing Alternatives 4A, 2D, and 5A for the purposes of CEQA and NEPA. Where appropriate, the RDEIR/SDEIS references the Draft BDCP EIR/EIS. Any new information developed for the proposed BDCP since the December 2013 public draft that is needed to adequately disclose environmental effects is included in this RDEIR/SDEIS in Appendix D. Accordingly, the entire BDCP has not been further revised, nor will it be re-released to the public at this time. Should the final agency decision makers choose not to pursue the alternative implementation strategy, but instead choose the original conservation plan implementation strategy and a corresponding action alternative (e.g., Alternative 4) that includes an HCP and NCCP, the current BDCP documents would be updated as necessary. The change of the Preferred Alternative does not make the existing conservation plan alternatives analyzed in the Draft EIR/EIS infeasible. The Lead Agencies will consider those conservation plan alternatives, in addition to the three new alternatives presented in this RDEIR/SDEIS, in their ultimate selection of the implementation strategy when preparing the Final EIR/EIS and completing the project approval process.

1.1.2 Legal Basis for Recirculation

In accordance with Public Resources Code Section 21092.1 and State CEQA Guidelines Section 15088.5, a CEQA lead agency must “recirculate” a revised Draft EIR or chapters or portions thereof for additional comments if, subsequent to the commencement of public review but prior to final EIR certification, the lead agency adds “significant new information” to an EIR. (See PRC Section 21092.1; State CEQA Guidelines Section 15088.5; *Laurel Heights Improvement Association of San Francisco, Inc. v. Regents of the University of California* [1993] 6 Cal.4th 1112 [*Laurel Heights II*].) State CEQA Guidelines Section 15088.5 provides four examples of disclosure that constitute “significant new information” for purposes of requiring recirculation of a revised EIR.

1. A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented.
2. A substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance.
3. A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the environmental impacts of the project, but the project’s proponents decline to adopt it.

4. The draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.

The revised environmental document must be subjected to the same "critical evaluation that occurs in the draft stage," so that the public is not denied "an opportunity to test, assess, and evaluate the data and make an informed judgment as to the validity of the conclusions." (*Sutter Sensible Planning, Inc. v. Board of Supervisors* [1981] 122 Cal.App.3d 813, 822.) Neither NEPA nor the NEPA Regulations adopted by the Council on Environmental Quality (CEQ) use the term "recirculation," but the CEQ NEPA Regulations do require or permit the preparation of a "supplement" to a draft EIS in some circumstances. Such a document must be prepared when either of the two conditions below applies.

1. The agency makes substantial changes in the proposed action that are relevant to environmental concerns.
2. There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 Code of Federal Regulations [CFR] 1502.9[c][1]).

A supplement to a draft EIS *may* be prepared "when the agency determines that the purposes of NEPA would be furthered by doing so" (40 CFR 1502.9[c][2]).

Although neither CEQA nor the State CEQA Guidelines include language describing optional grounds for recirculation, nothing in these laws prohibits recirculation solely to further "the purposes of CEQA," at least where, as here, there is no private permit applicant concerned with the economic costs of "voluntary" recirculation, and the proposed project is not subject to the 1-year deadline for completing EIRs found in PRC Sections 21100.2(a)(1) and 21151.5(a)(1).

The RDEIR/SDEIS is being circulated, noticed, and filed in the same manner as the Draft BDCP and Draft EIR/EIS. No additional scoping is necessary under CEQA for a Recirculated Draft EIR and under NEPA for a Supplemental Draft EIS. DWR filed a notice of availability (NOA) with the State Clearinghouse on July 10, 2015 and Reclamation filed the RDEIR/SDEIS with EPA on July 10, 2015 and submitted an NOA to the Federal Register on July 10, 2015 announcing the availability of the document for public review.

1.1.3 Identification of a Preferred Alternative

As was true at the time the Draft EIR/EIS was issued, the existence of a preferred alternative—or a proposed project—does not mean that the remaining alternatives from that document are no longer under active consideration. The choice of a preferred alternative is purely provisional and subject to change. The designation simply conveys that, based on information available at the time of the designation, one particular alternative appeared to the Lead Agencies to represent the likely best outcome compared to the other alternatives and does not in any way convey project approval. New information gained through additional public or agency input—such as will occur in response to this RDEIR/SDEIS—could ultimately lead to the approval and implementation of an entirely different alternative.

Under the NEPA Regulations for DOI, the *preferred alternative* is "the alternative which Reclamation believes would best accomplish the purpose and need of the proposed action while fulfilling its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. It may or may not be the same as Reclamation's proposed action, the non–Federal

entity's proposal or the environmentally preferable alternative."[3] Although a federal lead agency within DOI *may* identify a preferred alternative in a Draft EIS, the Lead Agency *must* do so in a Final EIS, unless prohibited from doing so by a law other than NEPA.[4]

Under CEQA, a *proposed project* is generally, though not always, the preferred CEQA alternative, in that the other alternatives are typically framed as "alternatives *to* the project[.]"[5] California courts have recognized that lead agencies for public projects often have "high esteem" for their proposals even prior to the preparation of an EIR, as "it is inevitable that the agency proposing a project will be favorably disposed to it."[6] Such unavoidable enthusiasm for a proposed outcome does not represent an impermissible pre-commitment, however, unless the agency has taken other steps that "effectively preclude any alternatives or mitigation measures that CEQA would otherwise require to be considered, including the alternative of not going forward with the project."[7]

1.1.4 Project Objectives and Purpose and Need

One of the primary challenges facing California is how to comprehensively address the increasingly significant and escalating conflict between the ecological needs of a range of at-risk Delta species and natural communities that have been and continue to be adversely affected by a wide range of human activities, while providing for more reliable water supplies for people, communities, agriculture, and industry.

This challenge must be addressed, in decisions made by DWR, CDFW, and the State Water Resources Control Board (State Water Board), as they endeavor to strike a reasonable balance between these competing public policy objectives and various actions taken within the Delta, including the proposed project. State policy regarding the Delta is summarized in the Sacramento–San Joaquin Delta Reform Act of 2009, which states:

> "it is the intent of the Legislature to provide for the sustainable management of the Sacramento-San Joaquin Delta ecosystem, to provide for a more reliable water supply for the state, to protect and enhance the quality of water supply from the Delta, and to establish a governance structure that will direct efforts across state agencies to develop a legally enforceable Delta Plan." (California Water Code, Section 85001, subd. [c]).
>
> The Delta "serves Californians concurrently as both the hub of the California water system and the most valuable estuary and wetland ecosystem on the west coast of North and South America." (California Water Code, Section 85002).

The ecological health of the Delta continues to be at risk, the conflicts between species protection and Delta water exports have become more pronounced, as amply evidenced by the continuing court decisions regarding the intersection of the ESA, the CESA, and the operations criteria of the SWP and the CVP. Other factors, such as the continuing subsidence of lands within the Delta, increasing seismic risks and levee failures, and sea level rise associated with climate change, serve to

[3] 43 C.F.R. § 46.420(d).

[4] 43 C.F.R. § 46.425(b).

[5] Cal. Code Regs., tit. 14, § 15126.6[a].

[6] Save Tara v. City of West Hollywood (2008) 45 Cal.4th 116, 136–137 (Save Tara), quoting City of Vernon v. Board of Harbor Commissioners (1998) 63 Cal.App.4th 677, 688.

[7] Save Tara, supra, 45 Cal.4th at p. 139.

further exacerbate these conflicts. Simply put, the overall system as it is currently designed and operated does not appear to be sustainable from an environmental perspective, and so a proposal to implement a fundamental, systemic change to the current system is necessary. This change is necessary if California is to "[a]chieve the two coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem." (California Public Resources Code Section 29702, subd. [a]).

This section presents the Lead Agencies' Project Objectives, which are required by the State CEQA Guidelines, and the Purpose and Need Statement, which is required by the CEQ NEPA Regulations.

1.1.4.1 Project Objectives

CEQA requires that an EIR contain a "statement of the objectives sought by the proposed project." Under CEQA, "[a] clearly written statement of objectives will help the Lead Agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations. The statement of objectives should include the underlying purpose of the project" (State CEQA Guidelines Section 15124[b]). Here, as the CEQA lead agency, DWR is adopting project objectives separately from the federal agencies' Purpose Statement as set forth in Section 1.1.4.2, *Purpose and Need*, as well as the description of Project Need as set forth in Section 1.1.4.2.

DWR's fundamental purpose in proposing the proposed project is to make physical and operational improvements to the SWP system in the Delta necessary to restore and protect ecosystem health, water supplies of the SWP and CVP south of the Delta, and water quality within a stable regulatory framework, consistent with statutory and contractual obligations.

The fundamental purpose is informed by past efforts taken within the Delta and the watersheds of the Sacramento and San Joaquin Rivers, including those undertaken through the CALFED Bay-Delta Program and Delta Risk Management Strategy. The fundamental purpose, in turn, gives rise to the following project objectives.

- Address adverse effects to state and federally listed species related to:
  - The operation of existing SWP Delta facilities and construction and operation of facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
  - The implementation of actions to improve SWP and/or CVP conveyance that have the potential to result in take of species that are listed under the ESA and CESA.
- Improve the ecosystem of the Delta by reducing the adverse effects to certain listed species of diverting water by siting additional intakes of the SWP and coordinated operations with the CVP.
- Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts and other existing applicable agreements.

In addition to the project objectives enumerated above, the project objectives listed below guide the development of the proposed project and alternatives.

- To meet the standards identified in the ESA and the California Fish & Game Code, including the CESA or NCCPA, by, among other things, minimizing and fully mitigating the impacts of take, and, if possible, protecting, restoring, and enhancing aquatic and terrestrial natural communities and

ecosystems that support listed and sensitive species within the geographic scope of the proposed project.

- To make physical improvements to the conveyance system in anticipation of rising sea levels and other reasonably foreseeable consequences of climate change.
- To make physical improvements to the conveyance system that will minimize the potential for public health and safety impacts resulting from a major earthquake that causes breaching of Delta levees and the inundation of brackish water into the areas in which the SWP and CVP pumping plants operate in the southern Delta.
- To develop projects that restore and protect water supply and ecosystem health and reduce other stressors on the ecological functions of the Delta in a manner that creates a stable regulatory framework under the ESA and either the CESA or NCCPA.
- To identify new operations and a new configuration for conveyance of water entering the Delta from the Sacramento River watershed to the existing SWP and CVP pumping plants in the southern Delta by considering conveyance options in the north Delta that can reliably deliver water at costs that are not so high as to preclude, and in amounts that are sufficient to support, the financing of the investments necessary to fund construction and operation of facilities and/or improvements.

1.1.4.2 Purpose and Need

Just as CEQA requires an EIR to include a statement of "project objectives" as described above, NEPA requires that an EIS include a statement of "purpose and need" to which the federal agency is responding in proposing the alternatives, including the proposed action (40 CFR 1502.13). This purpose statement of the proposed action and project need described below, are consistent with the above project objectives in Section 1.1.4.1.

Purpose Statement

The purposes of the proposed actions are to achieve the following.

1. Construction and operation of facilities and/or improvements for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
2. Operation of the existing and potential new SWP facilities and existing CVP Delta facilities.
3. The activities described in 1) and 2) occurring in a manner that minimizes or avoids adverse effects to listed species, and allows for the protection, restoration and enhancement of aquatic, riparian and associated terrestrial natural communities and ecosystems.
4. Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts held by SWP contractors and certain members of San Luis Delta Mendota Water Authority, and other existing applicable agreements.

The above Purpose statement reflects the intent to advance the coequal goals set forth in the Sacramento–San Joaquin Delta Reform Act of 2009 of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The above phrase—*restore and protect the ability of the SWP and CVP to deliver up to full contract amounts*—is related to the upper limit of legal CVP and SWP contractual water amounts and delineates an upper bound for development of EIR/EIS alternatives, not a target. It is not intended to imply that increased quantities of water will be delivered under the proposed project. As indicated by the "up to full

contract amounts" phrase, alternatives need not be capable of delivering full contract amounts on average in order to meet the project purposes. Alternatives that depict design capacities or operational parameters that would result in deliveries of less than full contract amounts are consistent with this purpose.

Project Need

The need for the action is derived from the multiple, and sometimes conflicting, challenges currently faced within the Delta. The Delta has long been an important resource for California, providing municipal, industrial, agricultural and recreational uses, fish and wildlife habitat, and water supply for large portions of the state. However, by several key criteria, the Delta is now widely perceived to be in crisis. There is an urgent need to improve the conditions for threatened and endangered fish species within the Delta. Improvements to the conveyance system are needed to respond to increased demands upon and risks to water supply reliability, water quality, and the aquatic ecosystem.

Delta Ecosystem Health and Productivity

Variability in the location and timing of flows, salinity, and habitat was common in the pre-European Delta. But for the past 70 years, the Delta has been managed as a tidal/freshwater system. During the same period, the ecological productivity for Delta native species and their habitats has been in decline. Removal of much of the variable pre-European heterogeneous mix of fresh and brackish habitats, necessary to support various life stages of some of the Delta native species, has had a limiting effect on the diversity of native habitat within the Delta. In addition, urban development, large upstream dams and storage reservoirs, diversions, hydraulic mining, and the development of a managed network of navigation, flood control, and irrigation canals have all affected water flow patterns and altered fish and wildlife habitat availability. Most of the original tidal wetlands and many miles of sloughs in the Delta were removed by channelization and levee construction between the 1850s and 1930s. These physical changes, coupled with higher water exports and declines in water quality from urban and agricultural discharges and changes in constituent dilution capacity from managed inflows and diversions, have stressed the natural system and led to a decline in ecological productivity.

Significant declines have been reported in economically important fish species such as Chinook salmon. Delta smelt, considered by many to be an indicator species for the health of the Delta ecosystem, is just one component species in the community-wide pelagic organism decline. Fishery resource changes may be attributable to numerous factors, including water management systems and facilities, water quality/chemistry alterations, and nonnative species introductions.

Water Supply Reliability

The distribution of precipitation and water demand in California is unbalanced. Most of the state's precipitation falls in the north, yet substantial amounts of water demand are located south and west of the Delta, including irrigation water for southern Central Valley agriculture, and municipal and industrial uses in southern California and the Bay Area. This supply/demand imbalance led to development of two major water projects: the SWP and the CVP.

Together, the SWP and CVP systems are two of the largest and most complex water projects in the nation and provide the infrastructure for the movement of water throughout much of California. They function under a suite of Congressional authorizations, interagency agreements, regulatory

requirements, and contractual obligations that govern daily operations and seasonal performance. These include various authorizing legislation, the USFWS and NMFS BiOps, including the Reasonable and Prudent Alternatives, and the water right permits issued by the State Water Board, among others. Regulations for the combined SWP and CVP operations are intended to protect the beneficial uses of Delta water, which include municipal, industrial, and agricultural water uses, fish and wildlife uses, environmental protection, flood management, navigation, water quality, power, and recreation.

The water rights of the SWP and CVP are conditioned by the State Water Board to protect the beneficial uses of water within the Delta under each respective project's water rights. In addition, under the COA, DWR and Reclamation coordinate their reservoir releases and Delta exports to enable each project to achieve benefit from their water supplies and to operate in a manner protective of beneficial uses as required by their water right permits. It is the responsibility of the SWP and CVP to meet these obligations regardless of hydrologic conditions. In 2006, Governor Schwarzenegger's Executive Order S-17-06 created the Delta Vision Task Force to address some of the issues facing the Delta. In the closing days of the Task Force's work, the State Water Board presented information indicating that quantities totaling several times the average annual unimpaired flows in the Delta watershed could be available to water users based on the face value of water permits already issued. However, the hydrology, the SWP and CVP water contracts, and environmental regulations control actual quantities that could be made available for use and diversion.

The current and projected future inability of the SWP and CVP to deliver water to meet the demands of certain south of Delta CVP and SWP water contractors is a very real concern. More specifically, there is an overall declining ability to meet defined water supply delivery volumes and water quality criteria to support water users' needs for human consumption, manufacturing uses, recreation, and crop irrigation.

Delta Hydrology and Water Quality

Generally, Delta hydrodynamics are defined by complex interactions between tributary inflows, tides, in-Delta diversions, and SWP and CVP operations, including conveyance, pumping plants, and operations of channel barriers and gates. The degree to which each variable impacts the overall hydrology of the Delta varies daily, seasonally, and from year to year, depending on the magnitude of inflows, the tidal cycle, and the extent of pumping occurring at the SWP and CVP pumping plants. Changes in water inflow and outflow throughout the Delta affect the water quality within the Delta, particularly with regard to salinity. It has been estimated that seawater is pushing 3 to 15 miles farther inland since development began in the Delta over 150 years ago (Contra Costa Water District 6 2010).

Additionally, other water constituents of concern in the Delta have been identified through ongoing regulatory, monitoring, and environmental planning processes such as CALFED, planning functions of the State Water Board, and the CWA Section 303(d) list of state water bodies that do not meet applicable water quality standards. In June 2007 (with updates in February and May 2009), EPA gave final approval of a list of 18 chemical constituents identified in the Section 303(d) list for impaired Delta waters (State Water Resources Control Board 2007). Included in this list are dichlorodiphenyltrichloroethane (DDT) and other pesticides, mercury, polychlorinated biphenyls (PCBs), and selenium.

To further compound these challenges, fundamental changes to the Delta are certain to occur; the Delta is not a static ecological system. The anticipated effects of climate change will result in elevated sea levels, altered annual and inter-annual hydrological cycles, changed salinity and water temperature regimes in and around the Delta, and accelerated shifts in species composition and distribution. These changes add to the difficulty of resolving the increasingly intensifying conflict between the ecological needs of a range of at-risk Delta species and natural communities and the need to provide adequate and reliable water supplies for people, communities, agriculture, and industry. Anticipating, preparing for, and adapting to these changes are key underlying drivers for the proposed project.

1.1.5 Roles and Responsibilities of Key Federal and State Agencies

This document is a joint RDEIR/SDEIS prepared in compliance with the requirements of CEQA and NEPA. Before the selection and approval of an alternative considered, the lead agencies must comply with the necessary state and federal environmental review requirements. This document, along with the BDCP Draft EIR/EIS, and expected Final EIR/EIS are intended to provide sufficient CEQA and NEPA support for approval of the proposed project or any of the action alternatives for either compliance strategy. As implementation of the proposed project or any of the action alternatives will require permits and approvals from public agencies other than the lead agencies, the CEQA and NEPA documents are prepared to support the various public agency permit approvals and other discretionary decisions. These other public agencies are referred to as responsible agencies and trustee agencies under CEQA (State CEQA Guidelines Sections 15381 and 15386) and cooperating agencies under NEPA (e.g., USACE and EPA). The key agencies roles and responsibilities are summarized below.

Responsible agencies are state or local public agencies other than the CEQA lead agency that have discretionary approval over the project. In most circumstances, CEQA requires a responsible agency to use the lead agency's CEQA document to support its own decision-making process (State CEQA Guidelines Section 15096). Trustee agencies include state agencies that have jurisdiction by law over natural resources affected by a project that are held in trust for the people of California. As described in CEQ's NEPA regulations (40 CFR 1501.6), federal agencies other than the NEPA lead agency that have jurisdiction by law or special expertise with respect to the environmental effects anticipated from the project can be included as cooperating agencies. Federal agencies may use the lead agency's NEPA document to support their own decision-making process, if appropriate. A cooperating agency participates in the NEPA process and may provide input (i.e., expertise) during preparation of the NEPA document. Federal agencies may designate and encourage nonfederal public agencies, such as state, local, and tribal agencies that meet the same criteria as federal cooperating agencies, to participate in the NEPA process as cooperating agencies (40 CFR 1508.5).

Additionally, other federal and state agencies may contribute to and rely on information prepared as part of the environmental compliance process, including, but not limited to, this RDEIR/SDEIS and supporting materials. A listing of the agencies and respective potential review/approval responsibilities, in addition to those under CEQA and NEPA, is provided in Table 1-1.

1.1.5.1 Lead Agencies

Before the selection and approval of one of the alternatives considered through the CEQA and NEPA process, the lead agencies must comply with the necessary state and federal environmental review requirements. This document, along with the BDCP Draft EIR/EIS issued in December 2013, and the expected Final EIR/EIS are intended to provide sufficient CEQA and NEPA support for project approval and to inform permit decisions for the issuance of various project permits and authorizations. DWR is lead agency for CEQA compliance purposes and Reclamation is lead agency for NEPA compliance purposes.

DWR has the responsibility to operate and maintain the SWP and would be responsible for all construction activities associated with the proposed project and alternatives, including new intakes and associated conveyance facilities. DWR would operate and maintain any new SWP facilities and may also partake in discretionary actions related to coordination with Reclamation or its contractors. DWR may also have other actions related to contract amendments to fund the selected action.

While DWR would be responsible for construction of all water conveyance facilities, Reclamation would operate the relevant CVP Delta facilities in coordination with the SWP, including new intake and conveyance facilities, through the COA[8]. SWP operation of new conveyance facilities and/or flow patterns proposed under the proposed project or alternatives would require changes in existing CVP operations specific to the Delta that provide for diversion, storage, and conveyance of CVP water consistent with applicable law and contractual obligations. Reclamation's action in relation to the proposed project or alternatives would be to adjust CVP operations in the Delta to accommodate new conveyance facility operations and/or flow requirements, in coordination with SWP operations. At this time it is anticipated that CVP upstream operations will not change to accommodate construction and operation of new water conveyance facilities as may be proposed. However, if Reclamation determines that changes in upstream operations are warranted to maintain operational efficiencies or for other reasons, Reclamation may undertake additional environmental analysis.

1.1.5.2 U.S. Fish and Wildlife Service and National Marine Fisheries Service

The United States Congress passed the ESA in 1973 to provide a means for conserving endangered and threatened species and the ecosystems on which they depend. The ESA has three major components relevant to the BDCP.

- Section 7 requires that federal agencies, in consultation with the federal fish and wildlife agencies, ensure that their actions are not likely to jeopardize the continued existence of species or result in modification or destruction of critical habitat.
- Section 9 prohibits the taking of listed species.
- Section 10 allows permits to be issued that authorize the incidental take of threatened and endangered species.

[8] COA was entered into at the direction of Congress by the United States of America and the State of California in November 1986.

Section 7 of the ESA provides that each federal agency must ensure, in consultation with the Secretary of the Interior or Commerce, that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of areas determined to be critical habitat (16 United States Code [USC] 1536(a)(2)). Section 7 requires federal agencies to engage in formal consultation with USFWS and/or NMFS for any proposed actions that are likely to adversely affect listed species. A BiOp is issued by USFWS or NMFS at the completion of formal consultation. The BiOp can conclude that the project as proposed is either likely or not likely to jeopardize the continued existence of the species or destroy or adversely modify designated critical habitat. If the BiOp concludes no jeopardy, the action can proceed as proposed consistent with the incidental take statement, which authorizes a specified level of take. The incidental take statement contains "reasonable and prudent measures" that are designed to minimize the level of incidental take and that must be implemented as a condition of the take authorization (50 CFR 402.14(i)(5)). If the BiOp concludes jeopardy, USFWS or NMFS will identify "reasonable and prudent alternatives" to the proposed action that would avoid jeopardizing the species.

Section 9(a)(1)(B) of the ESA prohibits the take by any person of any endangered fish or wildlife species; take of threatened fish or wildlife species is prohibited by regulation. The ESA prohibits the take of any listed threatened fish or wildlife species in violation of any regulation promulgated by USFWS or NMFS. Take under ESA is defined broadly to mean harass, harm, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct (16 USC 1532 [1988]). Harm is defined by regulation to mean an act that actually kills or injures wildlife, including those activities that cause significant habitat modification or degradation resulting in the killing or injuring of wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). The take prohibitions of the ESA apply unless take is otherwise specifically authorized or permitted pursuant to the provisions of Section 7 or Section 10 of the ESA. The protections for listed plant species under the ESA are more limited than for fish and wildlife.

Section 10 of the ESA provides the basis for nonfederal entities to obtain authorization for the take of listed species. For those actions for which no federal nexus exists, private individuals, corporations, state and local government agencies, and other nonfederal entities that wish to conduct otherwise lawful activities that may incidentally result in the take of a listed species must first obtain a Section 10 permit from USFWS and/or NMFS. The nonfederal entity is required to develop an HCP as part of the permit application process.

Under Section 10(a)(1)(B) of the ESA, USFWS and NMFS may permit the incidental take of listed species that may occur as a result of an otherwise lawful activity. To obtain a Section 10(a)(1)(B) permit, an applicant must prepare an HCP that meets the following five issuance criteria.

- The taking will be incidental to an otherwise lawful activity.
- The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking.
- The applicant will ensure that adequate funding for the Plan will be provided.
- The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.
- Other measures, if any, which USFWS and NMFS require as being necessary or appropriate for purposes of the Plan will be met (16 USC 1539(a)(2)(A)).

The proposed action and action alternatives will require ESA compliance, including the requirement to obtain incidental take authorization. The following discussion presents the alternative compliance strategies, depending on the particular alternative.

Section 7 of the Endangered Species Act

Where the alternative does not include preparation of an HCP, ESA compliance for construction and operation of water intakes in the north Delta and associated conveyance facilities would be achieved solely through Section 7. For these alternatives, USFWS and NMFS would not issue a permit and would not act as a lead agency for NEPA compliance. Where Section 7 is the ESA compliance strategy, USFWS and NMFS will assume roles as cooperating agencies for purposes of the NEPA review.

Reclamation would be the lead federal action agency for Section 7 compliance where a non-HCP alternative is selected. Reclamation's Section 7 compliance would be expected to also address the Section 7 compliance needs for the USACE permit actions. In cooperation with DWR, Reclamation would prepare a biological assessment (BA) for submission to USFWS and NMFS requesting formal consultation under ESA Section 7. It is expected that USFWS and NMFS would ultimately prepare a BiOp authorizing incidental take of federally listed species.

Section 10 of the Endangered Species Act

Where the alternative involves preparation of an HCP, ESA compliance will occur primarily through Section 10. Under this alternative compliance strategy, DWR and certain federal and state water contractors[9] would submit permit applications to USFWS and NMFS for authorization, over a 50-year permit term, to take endangered or threatened species and non-listed "covered species" related to a broad range of conservation measures, including construction and operation of water intakes in the north Delta and associated conveyance facilities, and would also request certain assurances over the 50 year permit term related to the proposed covered species. For this alternative compliance strategy, USFWS and NMFS would, along with Reclamation, act as lead agencies for NEPA compliance. The compliance process under Section 10 is separate from Section 7 consultations but under this approach, USFWS, NMFS and Reclamation would all require compliance with Section 7 but much of the same information developed during the Section 10 process would be utilized for the Section 7 consultations.

Magnuson-Stevens Fishery Conservation and Management Act

Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NMFS on activities that may affect essential fish habitat (EFH) for species that are managed under federal fishery management plans in United States waters. The statutory definition of EFH includes *those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity*, which encompasses all physical, chemical, and biological habitat features necessary to support the entire life cycle of the species in question. Waters potentially affected by either alternative compliance strategy include EFH for Pacific salmon, groundfish, and coastal pelagic

[9] Kern County Water Agency; Metropolitan Water District of Southern California; San Luis & Delta-Mendota Water Authority; Santa Clara Valley Water District; State and Federal Contractors Water Agency; Westlands Water District; and Alameda County Flood Control and Water Conservation District (Zone 7 Water Agency).

fishes, and it is expected that compliance with the Magnuson-Stevens Act for the proposed project or any of the action alternatives will be through NMFS' issuance of the BiOp through Section 7 of the ESA.

1.1.5.3 U.S. Army Corps of Engineers[10]

USACE has regulatory authority over activities within certain waters within the project area. Depending on the activity and the location of that activity in relation to particular resources, USACE may be required to issue an authorization for that activity under:

- Section 404 of the CWA (discharge of dredged or fill material into waters of the United States).
- Section 10 of the Rivers and Harbors Act (activities in, under, or over navigable waters of the United States).
- Section 14 of the Rivers and Harbors Act (activities that have the potential to affect USACE civil works projects, including project levees).

Section 404 of the Clean Water Act

Activities that would result in the discharge of dredged or fill materials into "waters of the U.S." must obtain authorization from USACE pursuant to Section 404 of the CWA (33 USC 1251 et seq.). A permit issued under Section 404 can take the form of either a General Permit or an Individual Permit. Individual Permits are designed for activities that have the potential to have more than a minimal effect on jurisdictional waters or that otherwise do not qualify to proceed under a General Permit. The discharge activities that would occur in connection with either alternative compliance strategy, including that of the proposed project, or any action alternatives, would require an Individual Permit.

Section 10 of the Rivers and Harbors Act

Activities that would involve the construction of any structure in or over any navigable water of the United States must obtain authorization from USACE pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 USC §403 et seq.; 33 CFR §§ 322 et seq.). Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if "the structure or work affects the course, location, or condition of the water body" (33 CFR §322.3(a)). The law applies to any dredging or disposal of dredged materials, excavation, filling, rechannelization, or any other modification of a navigable water of the United States, and applies to all structures, from the smallest floating dock to the largest commercial undertaking (33 CFR §322.2(b)).

Where the activities overlap, the process for obtaining a permit under Section 10 of the Rivers and Harbors Act is combined with the process for obtaining a permit under Section 404 of the CWA and compliance with the 404 permitting criteria will cover the substantive requirements of the Rivers and Harbors Act permitting process. The activities related to navigable waters would occur in connection with either alternative compliance strategy, including that of the proposed project, or any action alternatives, and would require permit under Section 10 of the Rivers and Harbors Act. DWR would apply to USACE for issuance of one permit consistent with both Section 10 of the Rivers and Harbors Act and Section 404 of the CWA.

[10] See Appendix E, for more detailed discussion of the USACE permit process and the specific informational needs of USACE under its various regulatory authorities.

Section 14 of the Rivers and Harbors Act

Section 14 of the Rivers and Harbors Act (33 USC § 408) requires permission from the Secretary of the Army, acting through USACE to alter an existing USACE civil works project. To grant permission under Section 408, USACE must determine that the proposed alteration does not impair the usefulness of the USACE project, and would not be injurious to the public interest. This is generally referred to as "Section 408 permission." Section 408 permission would be required for alteration and/or modification of Federally constructed levees associated with either alternative compliance strategy, including that of the proposed project, or any action alternatives. The informational requirements under the Section 408 process necessarily includes a detailed level of engineering design, as well as a detailed level of analysis related to effects to the USACE civil works projects and indirect hydraulic effects. The information contained in the current CEQA/NEPA documents may not fully meet this level of detail and additional informational submittals and analysis may be necessary. As a result of these submittals, prior to issuance of final 408 permission, additional NEPA compliance by USACE may be required.

For USACE engagement in the permit and authorization activities described above, NEPA compliance will be necessary. USACE will be acting as a Cooperating Agency within the current NEPA process for the proposed project and all action alternatives. In addition, USACE has designated Reclamation as the lead federal action agency for purposes of compliance with Section 7 of the ESA.

1.1.5.4 Environmental Protection Agency

CWA Section 404

USACE is solely responsible for making final Section 404 (and Rivers and Harbors Act) permit decisions, including final determinations of compliance with USACE permit regulations, and the Section 404(b)(1) Guidelines (33 USC § 1344; 40 CFR 230.11; Clean Water Act Section 404(q) Memorandum of Agreement Between The Environmental Protection Agency and The Department of the Army to "Minimize, to the Maximum Extent Practicable, Duplication, Needless Paperwork and Delays in the Issuance of Permits" (August 11, 1992)) (404(q) MOA). However, in conjunction with USACE, EPA promulgates guidelines (and guidance on those guidelines) that USACE applies to the Section 404 permit process, and EPA may provide USACE with comments during the permitting process (33 USC § 1344(b)(1); 40 CFR 230, 40 CFR 230.2(c)). The EPA may elevate an Individual Permit (in relation to Section 404) in the event that the EPA Regional Administrator believes that the issuance of the permit would result in substantial and unacceptable impacts to "aquatic resources of national importance" pursuant to Section 404(q) (33 USC § 1344(q)) and the 404(q) MOA. Under Section 404(c) of the CWA, if the EPA determines, after notice and opportunity for public hearings, that the permitted activity would have unacceptable adverse impacts on an aquatic or wetland ecosystem which is likely to result in significant degradation of municipal water supplies or on fishing, wildlife or recreation areas (33 USC 1344(c); 40 CFR 231.2(e), 231.3, 231.4), the EPA may "veto" the Individual Permit (in relation to Section 404). Specifically, EPA may 1) prohibit the specification (including the withdrawal of specification) of any defined areas as a disposal site and 2) deny or restrict the use of any defined area for specification (including the withdrawal of specification as a disposal site) (33 USC § 1344(c)).

NEPA Review

Section 309 of the Clean Air Act (codified at 42 USC § 7609) requires EPA to review and publicly comment on the environmental impacts of major Federal actions. EPA interprets Section 309 as requiring it to review and comment on all draft EISs. EPA's *Policy and Procedures for the Review of Federal Actions Impacting the Environment* published in 1984 establishes rating system criteria for EISs that establishes two separate determinations. The first basis of review is the environmental impacts of the action and results in one of the following ratings: LO (Lack of Objections), EC (Environmental Concerns), EO (Environmental Objections), and EU (Environmentally Unsatisfactory). The second area of review rates the adequacy of the draft EIS and results in one of the following ratings: 1 (adequate), 2 (Insufficient Information), or 3 (Inadequate).

Section 309 requires that when EPA determines that a proposed action "is unsatisfactory from the standpoint of public health or welfare or environmental quality, the matter shall be referred to the Council on Environmental Quality (CEQ)." CEQ has issued rules establishing a process for handling referrals from EPA. The rules encourage agencies to make concerted efforts to resolve their NEPA disputes informally and limit the CEQ to resolving referrals only for those interagency disputes that rise to the level of national importance (42 USC § 7609; 40 CFR 1504).

Water Quality Control Plans

In California, the State Water Board has the authority to adopt water quality control plans. Under the CWA, new or revised water quality standards must be approved by EPA. Therefore, EPA's Section 309 review of a federal agency's EIS will necessarily encompass its authority under the CWA.

1.1.5.5 California Department of Fish and Wildlife

The CESA prohibits the take of wildlife or plant species designated as threatened or endangered by the California Fish and Game Commission (Fish & Game Code 2080). Take under the CESA is defined as any action or attempt "to hunt, pursue, catch, capture, or kill" (Fish & Game Code 86). Like the ESA, the CESA allows for exceptions to the take prohibitions for otherwise lawful activities. The requirements of an application for incidental take under the CESA are described in Section 2081 of the Fish & Game Code. Incidental take of endangered, threatened, or candidate species may be authorized if an applicant demonstrates, among other things, that the effects of the proposed take will be minimized and fully mitigated (Fish & Game Code 2081(b)(2)). The NCCPA provides a mechanism for compliance with state endangered species regulatory requirements through the development of comprehensive, broad-scale NCCPs that focus on the needs of natural communities and the range of species that inhabit them (Fish & Game Code 2800 et seq.). Take of species listed under the CESA and covered by the NCCP may be authorized by CDFW (Fish & Game Code 2835).

California Fish and Game Code Section 2081 (b)

Where the alternative does not include preparation of an HCP, CESA compliance for construction and operation of water intakes in the north Delta and associated conveyance facilities would be achieved through Fish & Game Code Section 2081(b). The CESA allows CDFW to issue an incidental take permit for a State-listed threatened and endangered species only if specific criteria are met. For this alternative compliance strategy, CDFW would be a Responsible Agency for CEQA compliance purposes.

These criteria are reiterated in Title 14 of California Code of Regulations (CCR), Sections 783.4(a) and (b):

- The authorized take is incidental to an otherwise lawful activity;
- The effects of the authorized take are minimized and fully mitigated. The measures required to minimize and fully mitigate the effects of the authorized take;
    - Are roughly proportional in extent to the effect of the taking on the species.
    - Maintain the applicant's objectives to the greatest extent possible.
    - Are capable of successful implementation.
- Adequate funding is provided to implement the required minimization and mitigation measures and to monitor compliance with and the effectiveness of the measures;
- Issuance of the permit will not jeopardize the continued existence of a state-listed species.

As a component of Alternative 4A, an adaptive management and monitoring program would be implemented to use new information and insight gained during the course of construction and operation of water conveyance facilities to ensure that the proposed project continues to meet CESA Section 2081(b) standards.

Natural Community Conservation Plan Act

Where the alternative includes preparation of an HCP, compliance with the Fish & Game Code Section 86 take prohibition for construction and operation of water intakes in the north Delta and associated conveyance facilities would be achieved through NCCPA. The NCPPA requires preparation of an NCCP that identifies and provides for the regional or area wide protection of covered plants, animals, and their habitats, while allowing compatible and appropriate economic activity.

Under this alternative compliance strategy, DWR and certain federal and state water contractors would request NCCP approval from CDFW for authorization, over a 50-year permit term, to take endangered or threatened species and non-listed "covered species" related to a broad range of conservation measures, including construction and operation of water intakes in the north Delta and associated conveyance facilities, and would also request certain assurances over the 50 year permit term related to the proposed covered species. For this alternative compliance strategy, CDFW would be a Responsible Agency for CEQA compliance purposes.

California Fish and Game Code Section 1600 *et seq.*

California has adopted regulations to address impacts to many of the resources subject to Section 404 of the CWA. Although not entirely overlapping, these programs intersect frequently. Project proponents are required to obtain separate authorizations from USACE and CDFW.

Section 1602 of the Fish & Game Code requires any person, state, or local government agency to provide advance written notification to CDFW prior to initiating any activity that would cause the following actions.

- Divert or obstruct the natural flow of, or substantially change or remove material from the bed, channel, or bank of any river, stream, or lake.
- Result in the disposal or deposition of debris, waste, or other material into any river, stream, or lake (Fish & Game Code 1602).

The state definition of *lake, rivers, and streams* includes all rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life, and watercourses with surface or subsurface flows that support or have supported riparian vegetation (14 CCR 1.72.). Certain actions that will be implemented under the proposed project or any of the action alternatives under either compliance strategy will require a Lake and Streambed Alteration Agreement under Section 1602. As part of that process, CDFW will review notifications of actions to determine if the proposed action would substantially adversely affect existing fish and wildlife resources that are directly dependent on a lake, river, or stream. If CDFW determines that the proposed activity would not substantially adversely affect an existing fish and wildlife resource, it will notify DWR that no Lake and Streambed Alteration Agreement is required and the project may proceed (Fish & Game Code 1602(a)(4)(A)(i)). If CDFW determines that the project may substantially adversely affect an existing fish and wildlife resource, it will require, as part of a Lake and Streambed Alteration Agreement, reasonable measures necessary to protect the fish and wildlife resource (Fish & Game Code 1603(a)). As the issuance of a Lake and Streambed Alteration Agreement is subject to CEQA, CDFW would be a Responsible Agency for CEQA compliance purposes.

1.1.5.6 State Water Resources Control Board

Change Point of Diversion

DWR and Reclamation hold appropriative water rights permits, issued by the State Water Board, to divert water for the SWP and CVP, respectively. The water right permits identify specific points where water may be diverted from the stream system. The locations of the north Delta intake facilities that would be constructed as a part of the proposed project or any of the action alternatives are not currently identified as points of diversion in DWR's and Reclamation's water right permits. Thus, DWR and Reclamation must file petitions with the State Water Board, seeking State Water Board approval to add to the points of diversion in their affected water right permits.

The change petition process is described in Chapter 10 of Division 2, Part 2 of the California Water Code (Sections 1700-1707) and Title 23 of the California Code of Regulations Article 15 (Sections 791-799). DWR and Reclamation will provide notice of the proposed changes as the State Water Board requires, including written notice to CDFW. Other water right holders and the public will have the opportunity to object to the proposed changes by filing a protest with the State Water Board. If a protest is filed, the State Water Board will hold a hearing on the petitions before determining whether to grant or deny permission to make the requested changes. The State Water Board must find that there is a reasonable likelihood the proposed changes will not injure any legal user of the water and reasonably protect fish and wildlife, as identified in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary Water Quality Control Plan (Bay-Delta WQCP).

In addition, the Delta Reform Act states that an order by the State Water Board approving the change petitions shall include appropriate Delta flow criteria and shall be informed by the analysis performed in Section 85086 of the Water Code:

> Any order approving a change in the point of diversion of the State Water Project or the federal Central Valley Project from the southern Delta to a point on the Sacramento River shall include appropriate Delta flow criteria and shall be informed by the analysis conducted pursuant to this section. The flow criteria shall be subject to modification over time based and monitoring results, including the contribution of habitat and other conservation measures, into ongoing Delta water management.

Cal. Water Code § 85086(c)(2).

Many of the existing State Water Board requirements for operation of the SWP and CVP are contained within Water Rights Decision 1641 (D-1641). This decision places the responsibility upon the SWP and CVP to provide water to meet current Delta flow standards. This responsibility, however, is not assumed in the appropriate flow requirement of the Delta Reform Act. It is anticipated that many parties, including the SWP and CVP, will share in the requirement to meet Delta flow standards. Thus, appropriate flow standards, as required through the process described in Section 85086 of the California Water Code, would likely contribute only a portion of the total flow standards adopted by the State Water Board consistent with the Bay-Delta WQCP update.

The State Water Board is in the process of developing and implementing updates to the Bay-Delta WQCP that protect beneficial uses in the Bay-Delta watershed. The Bay-Delta WQCP ultimately sets the Delta flow standards for all water users in the Delta. This update is broken into four phases, some of which are proceeding concurrently. Phase 1 of this work, currently in progress, involves updating San Joaquin River flow and southern Delta water quality requirements for inclusion in the Bay-Delta WQCP. Phase 2 will involve comprehensive changes to the Bay-Delta WQCP to protect beneficial uses not addressed in Phase 1, focusing on Sacramento River driven standards. Phase 3 will involve implementation of Phases 1 and 2 through changes to water rights and other measures; this phase requires a hearing to determine the appropriate allocation of responsibility between water rights holders within the scope of the Phase 1 and Phase 2 plans. It is expected that in setting appropriate allocation of flow responsibilities in Phase 3, the State Water Board will consider the flow standards set in the SWP/CVP change petition process, as required in Section 85086 of the California Water Code. Phase 4 will involve developing and implementing flow objectives for priority Delta tributaries upstream of the Delta.

Section 401 of the Clean Water Act – Water Quality Certification

Pursuant to Section 401, states can certify or deny federal permits or licenses that might result in a discharge to state waters, including wetlands (33 USC 1341). Section 404 permit applicants must obtain a “water quality certification” from the state water quality agency indicating that the proposed activity complies with all applicable state water quality standards, limitations, and restrictions. In California, the Regional Water Quality Control Boards (RWQCBs) issue water quality certifications within their jurisdictions. Appeals to the decisions of the RWQCBs are heard by the State Water Board. The State Water Board will issue the Section 401 certification, however, in certain cases, for example where projects cross multiple RWQCB jurisdictions or where issuance of water right authorization is required.

Because the proposed project and any of the action alternatives in either compliance strategy will require a permit under Section 404, they will necessarily require obtaining 401 certification from the State Water Board. DWR will submit a request for water quality certification for the project to the State Water Board when it submits an application for a permit under Section 404. As part of this request to the State Water Board, DWR will provide a completed application form, a plan that describes how unavoidable effects to waters of the State will be minimized or mitigated, copies of CWA Section 404 permit application materials that are pertinent to the CWA Section 401 certification, and the appropriate permit fee. Once the State Water Board receives the application, it has 30 days to determine if it is complete; once complete, the State Water Board has 60 days to review all documentation and issue certification. The State’s 401 water quality certification is

subject to CEQA, and the State Water Board is a Responsible Agency under CEQA compliance purposes.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code 13000 et seq.) sets out a comprehensive regulatory, planning, and management program to protect water quality and beneficial uses of the State's water. The act established the State Water Board's authority to preserve and enhance the quality of California's water resources, and to ensure proper allocation and efficient use of water.

Under the Porter-Cologne Water Quality Control Act, the State Water Board is required to prepare a water quality control plan for the Bay-Delta WQCP. While the RWQCBs have primary responsibility for formulating and adopting water quality control plans for their respective regions, the State Water Board also is authorized to develop and adopt water quality control plans. In such instances, the water quality control plan adopted by the State Water Board supersedes regional plans developed for the same waters, to the extent that they conflict.

Beneficial uses include uses such as domestic, agricultural, and industrial supply; power generation; recreation and aesthetic use; navigation; and preservation and enhancement of fish, aquatic, and wildlife resources. Water quality objectives or standards reflect the levels of water quality constituents that have been determined to be necessary to protect beneficial uses. Implementation plans describe actions to be taken to achieve the objectives and set out programs for monitoring, management, and enforcement.

The State Water Board is vested with primary regulatory authority over flows, water quality, and other water rights issues outlined in the Bay-Delta WQCP. As stated above, the actions described in the proposed project or any of the action alternatives include modifications to the water conveyance system and will require the approval of the State Water Board.

Discharges to waters that are not considered "waters of the United States" are not subject to the CWA and therefore do not need a permit under Section 404 or 401 certification from the State Water Board. These discharges, however, still must meet the State's water quality requirements as prescribed in the WQCPs under Porter-Cologne. DWR will submit a request for water quality certification for the project to the State Water Board when it submits an application for a permit under Section 404. As part of the request to the State Water Board for 401 certification, DWR will also request authorization for discharges to state waters under Porter-Cologne.

1.1.5.7 Delta Stewardship Council

The Delta Reform Act gave the Delta Stewardship Council (Council) direction and authority to serve two primary governance roles: 1) set a comprehensive, legally enforceable direction for how the State manages important water and environmental resources in the Delta through the adoption of a Delta Plan, and 2) ensure coherent and integrated implementation of that direction through coordination and oversight of State and local agencies proposing to fund, carry out, and approve Delta-related activities.

Delta Plan

Delta Reform Act compliance for the non-HCP alternatives 2D, 4A, and 5A, involving construction and operation of water intakes in the north Delta and associated conveyance facilities would, be achieved through either the Delta Plan Consistency certification process or through a possible future amendment to the Delta Plan.

The Delta Reform Act requires state and local actions that fit the legal definition of a covered action to be consistent with the policies included in the Delta Plan. In contrast to how many other governmental plans are implemented, the Council does not exercise direct review and approval authority over covered actions to determine their consistency with the regulatory policies in the Delta Plan. Instead, State or local agencies self-certify Delta Plan consistency, and the Council serves as an appellate body for those determinations.

For a State or local agency to determine whether its proposed plans, programs, or projects are covered actions under the Delta Plan and, therefore, subject to the regulatory provisions in the plan, it must start with the Delta Reform Act, which defines a covered action as (Water Code Section 85057.5(a)):

> …a plan, program, or project as defined pursuant to Section 21065 of the Public Resources Code that meets all of the following conditions:
>
> - Will occur, in whole or in part, within the boundaries of the Delta or Suisun Marsh;
> - Will be carried out, approved, or funded by the state or a local public agency;
> - Is covered by one or more provisions of the Delta Plan;
> - Will have a significant impact on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and state interests in the Delta.

A State or local agency that proposes to carry out, approve, or fund a plan, program, or project is the entity that must determine whether that plan, program, or project is a covered action. That determination must be reasonable, made in good faith, and consistent with the Delta Reform Act and relevant provisions of the Delta Plan. If requested, Council staff will meet with an agency's staff during early consultation to review consistency with the Delta Plan and to offer advice as to whether the proposed plan, program, or project appears to be a covered action, provided that the ultimate determination in this regard must be made by the agency.

Once a state or local agency has determined that its plan, program, or project is a covered action under the Delta Plan, it is required to submit a written certification to the Council, with detailed findings, demonstrating that the covered action is consistent with the Delta Plan (Water Code Sections 85225 et seq.). The Council has developed a discretionary checklist that agencies may use to facilitate the process, as well as certification forms and related materials, available on the Council website.

If an agency determines that a proposed plan, program, or project is not a covered action that determination is not subject to Council regulatory review, but is subject to judicial review. Any person who claims that a proposed covered action is inconsistent with the Delta Plan and, as a result of that inconsistency, the action will have a significant adverse impact on the achievement of one or both of the coequal goals or implementation of government-sponsored flood control programs to reduce risks to people and property in the Delta, may file an appeal with regard to a certification of consistency submitted to the Council.

Delta Plan Appeals Process

The process for an appeal to the Delta Stewardship Council includes submittal of an appeal that clearly and specifically sets forth the basis for the claim, including specific factual allegations, that the covered action is inconsistent with the Delta Plan. The appeal must be filed no later than 30 days after the submission of the certification of consistency and if no person appeals the certification of consistency, the state or local public agency may proceed to implement the covered action.

The appeal shall be heard by the Council within 60 days of the date of the filing of the appeal, unless the Council, or by delegation the executive officer, determines that the issue raised on appeal is not within the Council's jurisdiction or does not raise an appealable issue. The Council shall make its decision on the appeal within 60 days of hearing the appeal. The Council, or by delegation the executive officer, may also dismiss the appeal for failure of the appellant to provide information requested by the Council within the period provided, if the information requested is in the possession or under the control of the appellant.

After a hearing on an appealed action, the Council shall make specific written findings either denying the appeal or remanding the matter to the state or local public agency for reconsideration of the covered action based on the finding that the certification of consistency is not supported by substantial evidence in the record before the state or local public agency that filed the certification. Upon remand, the state or local agency may determine whether to proceed with the covered action. If the agency decides to proceed with the action or with the action as modified to respond to the findings of the Council, the agency shall, prior to proceeding with the action, file a revised certification of consistency that addresses each of the findings made by the council and file that revised certification with the Council. According to the Council, if the covered action is found to be inconsistent, the project may not proceed until it is revised so that it is consistent with the Delta Plan. The Council's position on this issue has been challenged in court by the State Water Contractors.

Delta Plan BDCP Requirements

Where the alternative involves preparation of an HCP, such as the BDCP, Delta Reform Act compliance for all elements of the conservation plan would likely be achieved through the Council's consideration of the BDCP for inclusion in the Delta Plan. The Delta Reform Act sets out the conditions under which the Council is to incorporate the BDCP into the Delta Plan. To be considered for inclusion in the Delta Plan, CDFW must find that the BDCP complies with specified requirements, including compliance with NCCPA and CEQA, and review and analysis of certain flow requirements and alternatives. Upon CDFW's findings and approval of the BDCP as an NCCP (and as an HCP under the ESA), the Council is required to incorporate the BDCP into the Delta Plan. However, the determination by the CDFW that the BDCP meets the requirements of the Delta Reform Act may be appealed to the Council.

If the Council decides that it was incorrectly determined that the BDCP meets all of the requirements of Water Code Section 85320 for inclusion in the Delta Plan, and consequently grants the appeal, the determination may be revised to meet the issues raised by the Council, or Council's findings may be responded to in detail, setting forth reasons why the BDCP meets all of the requirements of Section 85320 for inclusion in the Delta Plan. Unless the Council on appeal decides that the BDCP meets all of the requirements of Section 85320 for inclusion in the Delta Plan, the BDCP shall not be

incorporated in the Delta Plan and the public benefits associated with the BDCP shall not be eligible for State funding.

Table 1-1. Summary of Agencies and Review, Approval, or Other Responsibilities, in Addition to Those under CEQA and NEPA

Agency	Permit, Decision, Approval, or Other Action[a]
Federal	
Bureau of Reclamation (NEPA lead agency)	Permits or Consultations ESA Section 7 consultation Section 106 of the National Historic Preservation Act Other considerations Fish and Wildlife Coordination Act, 16 USC 661-667e (applies to restoration activities and not water operations) Archaeological Resource Protection Act Indian Trust Assets Central Valley Project Improvement Act Federal Water Project Recreation Act (16 USC 460(L) 12-21)
U.S. Fish and Wildlife Service (NEPA lead or cooperating agency[11])	Permits or Consultations All provisions of the Endangered Species Act, including: Biological Opinion (Section 7 of ESA) Incidental Take Permit (Section 10 [a][1][B] of ESA) for BDCP or other conservation plan alternatives Other considerations Fish and Wildlife Coordination Act, 16 USC 661-667e Migratory Bird Treaty Act EO 13186 Migratory Birds EO 13112 Invasive Species Central Valley Project Improvement Act
National Marine Fisheries Service (NEPA lead or cooperating agency[12])	Permits or Consultations All provisions of the Endangered Species Act, including: Biological Opinion (Section 7 of ESA) Incidental take permit (Section 10 [a][1][B] of ESA) for BDCP or other conservation plan alternatives Other Considerations Essential Fish Habitat under Magnuson-Stevens Fisheries Conservation and Management Act Fish and Wildlife Coordination Act, 16 USC 661-667e

[11] NEPA lead agency for actions involving BDCP or other conservation plan alternatives. NEPA cooperating agency for actions involving Alternative 4A or other non-conservation plan alternatives.

[12] NEPA lead agency for actions involving BDCP or other conservation plan alternatives. NEPA cooperating agency for actions involving Alternative 4A or other non-conservation plan alternatives.

Agency	Permit, Decision, Approval, or Other Action[a]
U.S. Army Corps of Engineers (NEPA cooperating agency)	Permits or Consultations Clean Water Act Section 404 Rivers and Harbors Act Section 10 Rivers and Harbors Act Section 14, 33 USC 408 ESA Section 7 consultation Section 106 of the National Historic Preservation Act Other Considerations Federal Water Project Recreation Act 16 USC 460(L) 12-21 Flood Control Act (Public Law 78-534 Stat. 890) Protection of Wetlands (EO 11990) Fish and Wildlife Coordination Act, 16 USC 661-667e
U.S. Environmental Protection Agency (NEPA cooperating agency)	NEPA Review (Clean Air Act, Section 309) Clean Water Act Review; and Clean Water Act Section 404 permitting oversight
State Historic Preservation Officer	Permits or Consultations Consultation under National Historic Preservation Act, Section 106; California State Projects (Public Resources Code Sections 5024, 5024.5)
U.S. Coast Guard (Potential NEPA cooperating agency)	Permits Rivers and Harbors Act Section 9 Bridge Permits Construction in Navigable Waters Navigational Aids – Private Aids to Navigation
Natural Resources Conservation Service	Farmland Protection Policy Act
State	
California Department of Water Resources (CEQA lead agency)	Other considerations Water Code Sections 11100 et seq. (Central Valley Project Act) Water Code Sections 12930 et seq. (California Resources Development Bond Act) Water Code 11451 (Control of Project) Approval of SWP water supply contract amendment and funding agreements
California Department of Fish and Wildlife (CEQA responsible agency, trustee agency)	Permits or Consultations NCCP Findings and Approval, Fish & Game Code Sections 2800 et seq. for BDCP or other conservation plan alternatives California Endangered Species Act, Incidental Take Permit – Section 2081(b) for Alternative 4A or other non-conservation plan alternatives Streambed Alteration Master Agreement (Fish & Game Code Section 1602) Scientific Collection permits under Fish and Game Code State wildlife areas Encroachment Permit Other considerations Instream Flow – Public Resources Code Section 10000 et seq. Fish & Game Code Section 5650 – water pollution Fish & Game Code Section 1790 – wetlands Fish & Game Code Section 3503 – Nests and Eggs Fish and Wildlife Coordination Act, 16 USC 661-667e Migratory Birds, Fish & Game Code Section 3513 Raptors, Fish & Game Code Section 3503.5 Code Section 1002 and California Code of Regulations Title 14 Sections 650 and 670.7 (Plan implementation)

Agency	Permit, Decision, Approval, or Other Action[a]
State Water Resources Control Board (CEQA responsible agency)	Permits or Consultations Section 401 Water Quality Certification and Waste Discharge Requirements, Porter-Cologne Act Water Right Change Petitions Clean Water Act Section 402 National Pollutant Discharge Elimination System Permit Compliance and NPDES Construction Stormwater General Permit Petitions for Extension of Time for Existing Water Right Permits Water Quality Order 99-08-DWQ: General Permit for Storm Water Discharges Associated with Construction Activity (33 USC 1342) Water Right for Long-term Transfer Petitions Other considerations Water Quality Control Plan for San Francisco Bay/Sacramento-San Joaquin Delta Estuary Basin Plan Amendment (33 USC 13240) General Certification Order for Dredging for Restoration Projects Groundwater Quality Monitoring Act, Water Code Sec 10780-10782.3 Porter-Cologne Act, California Water Code Sec 13000 et seq. Surface Water Rights, California Code of Regulations Section 303 State Water Board Decision 1641 (Water Quality)
Central Valley Regional Water Quality Control Board (potential CEQA responsible agency)	Permits or Consultations Discharges Associated with Construction Activity (33 USC 1342) Regional General Permits Waste Discharge Requirements for Dredging Projects or Fill-Related Activities Other considerations Basin Plan Amendment (33 USC 13240)
San Francisco Bay Regional Water Quality Control Board (potential CEQA responsible agency)	Permits or Consultations National Pollutant Discharge Elimination System (316(b) Permit) Stormwater Permit Waste Discharge Requirements for Dredging Projects or Fill-Related Activities Other considerations Basin Plan
Delta Stewardship Council (CEQA responsible agency)	Other considerations Determining, on appeal, whether the BDCP meets statutory criteria in the Delta Reform Act for inclusion in the Delta Plan Determining, on appeal, whether Alternative 4A or other action alternative or plan amendment is consistent with Delta Plan
State Lands Commission (CEQA responsible agency, trustee agency)	Other considerations Possible lease involving granted tide and submerged lands
California Department of Parks and Recreation (potential CEQA responsible agency, trustee agency)	Permits or Consultations Encroachment Permit
California Department of Boating and Waterways (potential[b] CEQA responsible agency)	Other considerations Coordination on construction and placement of gates, signage, and use of gates

Agency	Permit, Decision, Approval, or Other Action[a]
California Department of Transportation (CEQA responsible agency)	Permits or Consultations Encroachment Permit for realignment of State Route 160
Central Valley Flood Protection Board and Port of Stockton	Permits or Consultations Coordination consistent with local sponsor requirements under USACE Section 408 requirements
Regional Air Pollution Control Districts, California Air Resources Board (potential CEQA responsible agencies)	Permits or Consultations Permit to Operate an Internal Combustion Engine Stationary Source Permit Use of Portable Equipment During Construction Other considerations Clean Air Act
California Department of Public Health (potential CEQA responsible agency)	Permits or Consultations Water Supply Permits for Operations of Public Drinking Water Systems Other considerations State Drinking Water Program
San Francisco Bay Area Conservation and Development Commission (potential CEQA responsible agency)	Other considerations California Coastal Act/McAteer-Petris Act
Division of Safety of Dams (potential CEQA responsible agency)	Permits or Consultations California Code of Regulations Title 23, Section 310
California Public Utilities Commission	Permits or Consultations Right of way; potential relocation of utilities
Local and Other	
State and Federal Contractors Water Agency (NEPA cooperating agency)	Joint Powers Authority created for purposes of pursuing BDCP research and study
Contra Costa County (NEPA cooperating agency)	Floodplain development regulations (required by National Flood Insurance Program) Williamson Act cancellations Surface Mining and Reclamation Act
Sacramento County (NEPA cooperating agency)	Floodplain development regulations (required by National Flood Insurance Program) Williamson Act cancellations Surface Mining and Reclamation Act
Solano County (NEPA cooperating agency)	Floodplain development regulations (required by National Flood Insurance Program) Williamson Act cancellations Surface Mining and Reclamation Act
Yolo County (NEPA cooperating agency)	Floodplain development regulations (required by National Flood Insurance Program) Williamson Act cancellations Surface Mining and Reclamation Act
Reclamation District 999 (NEPA cooperating agency)	Easement/Right of way
Reclamation District 150 (NEPA cooperating agency)	Easement/Right of way

Agency	Permit, Decision, Approval, or Other Action[a]
Reclamation District 551 (NEPA cooperating agency)	Easement/Right of way
Reclamation District 3 (NEPA cooperating agency)	Easement/Right of way
North Delta Water Agency (NEPA cooperating agency)	Interest in resource issues
Individual SWP contractors	
Alameda County Flood Control and Water Conservation District, Zone 7 (potential CEQA responsible agency)	Possible actions related to the BDCP or other conservation plan alternatives
Santa Clara Valley Water District (potential CEQA responsible agency)	Possible actions related to the BDCP or other conservation plan alternatives
Kern County Water Agency (potential CEQA responsible agency)	Possible actions related to the BDCP or other conservation plan alternatives
Metropolitan Water District of Southern California (potential CEQA responsible agency)	Possible actions related to the BDCP or other conservation plan alternatives
Individual CVP contractors[c]	
San Luis & Delta-Mendota Water Authority (potential CEQA responsible agency)	Possible actions related to the BDCP or other conservation plan alternatives
The Westlands Water District (potential CEQA responsible agency)	Possible actions related to the BDCP or other conservation plan alternatives

[a] This list is not all inclusive and the agencies may use the EIR/EIS for other requirements not identified in this table.
[b] The term *potential* is used in this table generally. Whether particular entities are responsible agencies will be determined when a final BDCP is approved.
[c] To be determined when financing agreements are identified.

1.2 Purpose of Recirculated/Supplemental Documents

As explained above, the Draft EIR/EIS has been partially revised and is being recirculated for additional public review to address and evaluate the critical changes to Alternative 4 and the addition of Alternatives 4A, 2D, and 5A. Alternative 4A is now the CEQA and NEPA Preferred Alternative. With respect to Alternative 4, the RDEIR/SDEIS describes and analyzes the following: changes to conveyance facility design; revisions to proposed operations; changes to the proposed conservation strategy and habitat mitigation approach; and revisions and corrections to the analyses of certain impacts. Alternative 4A would entail the same conveyance facility design

changes, but it would not include the same kinds of changes to Alternative 4 related to BDCP CM2 through CM21.

To provide the public with the information necessary to understand revisions to the various documents and to limit extraneous information, the Lead Agencies have chosen not to republish complete revisions to the original Draft EIR/EIS, but rather to prepare materials focusing on new contents of the Draft EIR/EIS. The Lead Agencies' primary reason for undertaking additional public review of this RDEIR/SDEIS is to further the purposes of both CEQA and NEPA. Because the RDEIR/SDEIS addresses a project of interest and importance to the people, economy, and environment of the State of California, the Lead Agencies determined that additional formal public input was both desirable and appropriate.

Pursuant to the directives of CEQA, where a lead agency recirculates only revised portions of an EIR, the lead agency may require commenters to limit their new comments to the new material in the recirculated portions of the prior document and may preclude the commenters from commenting anew on topics or text not subject to a partial recirculation. After the additional round of public review is over and the CEQA lead agency is preparing its final EIR, "[t]he lead agency need only respond to (i) comments received during the initial circulation period that relate to chapters or portions of the document that were not revised and recirculated, and (ii) comments received during the recirculation period that relate to the chapters or portions of the earlier EIR that were revised and recirculated" (State CEQA Guidelines Section 15088.5[f][2]).

NEPA and the CEQ NEPA Regulations are silent on these issues, but the concept of a "supplement" to a Draft EIS strongly suggests that comments should be limited to material found within the bounds of that new document, and should not address matters already subjected to public review as part of the original Draft EIS.

In light of the foregoing, the Lead Agencies direct that public comments be restricted to the newly circulated information contained in the RDEIR/SDEIS. In other words, *the partial recirculation is not an opportunity to resubmit comments on previously published topics, or to add additional comments on previously published topics*. The comments previously submitted on the Draft EIR/EIS remain a part of the record and will be responded to in the Final EIR/EIS. Readers are therefore directed not to make comments on issues not directly contained in this RDEIR/SDEIS. The Lead Agencies do not intend to respond to any new comments on the original Draft EIR/EIS that are not addressed in the RDEIR/SDEIS. The Final EIR/EIS will include written responses to comments on both the RDEIR/SDEIS and the original Draft EIR/EIS. If comments on the original Draft EIR/EIS no longer apply based on the RDEIR/SDEIS analyses or project changes, the response will indicate that the comment has been addressed by the RDEIR/SDEIS or that the comment was not addressed because of the changes presented in the RDEIR/SDEIS.

1.3 Contents of the RDEIR/SDEIS

Following the extended public review of the Draft EIR/EIS, the Lead Agencies reviewed public and agency comments and continued to identify ways in which the BDCP and Draft EIR/EIS could be improved or alternative implementation strategies could be proposed to increase benefits and reduce potential environmental effects. The following is an overview description of the topics and types of revisions presented in the RDEIR/SDEIS, including additional context that describes the reasons why specific topics are included. For a visual representation of how the document is laid out

and how various segments relate to one another, please see the *Document Review Road Map* at the beginning of this document.

The RDEIR/SDEIS presents new information and addresses project revisions in several complementary ways. First, in many instances, new information and project changes are addressed in a series of discussions of particular topics that lend themselves to a narrative format (presented in Section 2.0, *Substantive Draft EIR/EIS Revisions*). Each of these discussions is a standalone essay on a discrete topic that has received substantive public comment. The Lead Agencies have taken this approach to make this document as user friendly as possible, and to avoid reprinting thousands of pages on which, under a different approach, minor modifications might have been made. Second, where the "essay" format was not workable or appropriate, or where actual text changes were necessary to complement particular essays, this RDEIR/SDEIS includes modified excerpts of text that originally appeared in the Draft EIR/EIS, with underlining showing new language and strikeout showing text being eliminated. These underline/strikeout revisions are referenced in the main text of the RDEIR/SDEIS as Appendix A, *Revisions to the Draft EIR/EIS*, which contains the actual text revisions. To give readers the best possible sense of the context in which such text changes occur, Appendix A includes section headings before and after modified passages, so that readers can understand precisely where, within Draft EIR/EIS chapters, the revisions occur. Appendix A does not include text changes that are either repetitive with the text presented in the RDEIR/SDEIS or are non-substantive. The Final EIR/EIS will include the entire presentation of all text changes made to the Draft EIR/EIS.

Many of the RDEIR/SDEIS revisions are focused on changes made to CM1 under Alternative 4 (i.e., related to modification of the north Delta intakes or water conveyance facilities) or to Alternatives 4A, 2D, and 5A (related to the alternative implementation strategy). This is appropriate because revisions are limited in most cases to Alternatives 4, 4A, 2D, and 5A and Alternative 4A is now the Preferred Alternative for CEQA and NEPA purposes. Consistent with the ongoing environmental review through CEQA and NEPA, Reclamation and DWR continue to modify the proposal to improve it from an environmental standpoint, and such changes in the proposed project do not necessitate parallel revisions to other alternatives addressed in the Draft EIR/EIS. There are some instances, however, in which changes to the description, analysis, or assumptions relating to Alternative 4, as well as changes made in response to relevant comments, have also required revisions to the descriptions or discussion of other alternatives. The categories of revisions presented in the RDEIR/SDEIS are described below.

1.3.1 Substantive Draft EIR/EIS Revisions

This RDEIR/SDEIS presents revisions to the Draft EIR/EIS in Section 2, *Substantive Draft EIR/EIS Revisions,* in a variety of ways, as indicated above. Based on public and technical review, a number of resource topics requiring revision are presented in a narrative format to highlight important revisions, provide sufficient context about the revisions, and add an explanation about how the revision improved the analysis. Each subsection, where appropriate, references Appendix A, which contains the in-text analysis changes. The topical essays in Section 2 of this RDEIR/SDEIS are listed below.

- Section 2.1, *Improved Fish and Aquatic Habitat Analyses*, summarizes revisions made to Chapter 11, *Fish and Aquatic Resources*, of the Draft EIR/EIS, including a discussion about improvements to the rationale provided for impact conclusions and methods for determining impacts on fish and aquatic habitat.

- Section 2.2, *Water Quality Revisions*, describes additional analyses undertaken to more accurately characterize the potential for exceedances of water quality standards and summarizes associated revisions.
- Section 2.3, *Air Quality, Health Risk Assessment, Transportation, and Noise Revisions*, presents revised emissions calculations based on improved construction assumptions and updates the health risk assessment, traffic, and noise analyses to reflect improved construction data.
- Section 2.4, *Revised Project Description and Enhanced Level of Detail*, presents additional revisions that explain how, for the purposes of CEQA and NEPA, project-level detail is included for water conveyance facilities and provides additional information about early implementation actions including examples of habitat restoration and enhancement activities.
- Section 2.5, *Analysis of Geotechnical Investigations*, provides an explanation about the method for incorporating analyses of geotechnical investigations into the analysis of the water conveyance facilities construction.

1.3.2 Alternative 4 Revisions

Following presentation of these topical essays, Section 3, *Conveyance Facility Modifications to Alternative 4,* provides an overview of the optimized design of water conveyance facilities associated with Alternative 4, and a discussion of the impacts and other associated text revisions made in each affected resource chapter. This summary provides references to the applicable text revisions presented in Appendix A. All the resource topics substantively affected by the modified conveyance facility design are addressed in this discussion. These topics are surface water, groundwater, water quality, fish and aquatic resources, terrestrial biological resources, land use, agricultural resources, recreation, aesthetics and visual resources, cultural resources, transportation, public services and utilities, energy, air quality, noise, hazards and hazardous materials, public health, minerals, and paleontological resources. As noted previously, Alternative 4A, and to some extent Alternatives 2D and 5A, incorporate Alternative 4's conveyance facility elements, including the revisions contained herein.

1.3.3 Alternative 4A, 2D, and 5A Analyses

Description and analysis of Alternatives 4A, 2D, and 5A are presented in Section 4, *New Alternatives: Alternatives 4A, 2D, and 5A*. Analyses presented in this section address impacts for all the resource topics considered in the Draft EIR/EIS. Impacts for which substantive differences than those under Alternative 4 have been identified are presented in full impact format with CEQA conclusions and NEPA effects and proposed mitigation measures where they are feasible and required to reduce a significant impact. This RDEIR/SDEIS is intended to provide project-level assessment of the potential effects of these three new alternatives, including project-specific mitigation. Impact analyses also include revisions made to the No Action Alternative for the limited purpose of providing a logical point of comparison for the NEPA analysis of Alternatives 4A, 2D, and 5A.

1.3.4 Cumulative Impact Analyses

In response to comments and in light of new information since the release of the Notice of Preparation (NOP) in 2009, this RDEIR/SDEIS includes additional probable or reasonably foreseeable proposed projects that, when considered together with the action alternatives (including Alternatives 4A, 2D, and 5A), could have a significant cumulative effect. The analysis

includes a discussion of the California Water Action Plan, California EcoRestore and the Sustainable Groundwater Management Act to describe the roles of the new Delta conveyance facilities and the habitat restoration in the context of the state's comprehensive vision for water management in California. This section also addresses the potential for cumulative effects of implementing the action alternatives in conjunction with these parallel efforts. The Draft EIR/EIS cumulative impact analyses have been revised to consistently reflect the two-step process required by CEQA.

1. Are the combined effects from both the proposed project and other projects "cumulatively significant"?
2. If yes, is the proposed project's incremental effect "cumulatively considerable" and thus significant?

The cumulative impact analysis is prefaced with a supplemental discussion summarizing any effects on a resource area associated with implementing other project actions concurrently with conveyance facility construction.

1.3.5 Draft EIR/EIS In-Text Chapter Revisions

Table 1-2 provides an overview of the Draft EIR/EIS chapters in which substantive changes have been made in this RDEIR/SDEIS and the topics that are addressed in each chapter as shown in Appendix A. Although text in many Draft EIR/EIS chapters is likely to be revised consistent with the approach in the RDEIR/SDEIS, portions of chapters and associated appendices that are recirculated include only those portions of text requiring substantial revisions and needed to convey the new information or analyses. This presentation allows for a more streamlined approach to conveying additional information in the RDEIR/SDEIS. Additional revisions may appear in the Final EIR/EIS.

Table 1-2. Summary of Portions of Draft EIR/EIS Revised in RDEIR/SDEIS

Revised Chapter(s)	Topics Revised or Added
Chapter 3, *Description of Alternatives*	• Revisions to water conveyance facilities under Alternative 4 • Analysis of geotechnical investigations • Revisions to discussion of environmental commitments • Improvements to description/analysis level of detail • Revisions to construction assumptions associated with Alternative 4 • Revisions to other aspects of the BDCP conservation strategy
Appendix 3B, *Environmental Commitments, AMMs and CMs*	• This appendix has been substantially revised and expanded to include a discussion of how these measures reduce impacts.
Chapter 5, *Water Supply*	• Revisions to cumulative impact analysis • Other revisions based on technical comments • Discussion of water rights modifications as they pertain to consumptive water use from restored habitat

Revised Chapter(s)	Topics Revised or Added
Chapters 6, 7, 9, 13, 16, 17, 18, 20, 21, 24, 25, 26, 27, 28, 30, *Surface Supply, Groundwater, Geology and Seismicity, Land Use, Socioeconomics, Aesthetics and Visual Resources, Cultural Resources, Public Services and Utilities, Energy, Hazards and Hazardous Materials, Public Health, Minerals, Paleontological Resources, Environmental Justice, Growth Inducement and Other Indirect Effects*	• Revisions to water conveyance facilities under Alternative 4 • Analysis of geotechnical investigations • Revisions to cumulative impact analysis • Other revisions based on technical comments
Chapter 8, *Water Quality*	• Revisions to assessment of key water quality constituents • Revisions to water conveyance facilities under Alternative 4 • Analysis of geotechnical investigations • Revisions to cumulative impact analysis • Other revisions based on technical comments
Chapters 10, 12, 14, 15, *Soils, Terrestrial Biological Resources, Agricultural Resources, Recreation*	• Revisions to water conveyance facilities under Alternative 4 • Analysis of geotechnical investigations • Revisions to cumulative impact analysis • Other revisions based on technical comments
Chapter 11, *Fish and Aquatic Resources*	• Revisions to aquatic species impact discussion based on technical comments • Revisions to water conveyance facilities under Alternative 4 • Analysis of geotechnical investigations • Revisions to cumulative impact analysis • Improvements to description/analysis level of detail
Chapters 19, 22, 23, *Transportation, Air Quality and Greenhouse Gas Emissions, Noise*	• Revised analysis based on updated construction assumptions • Revisions to water conveyance facilities under Alternative 4 • Analysis of geotechnical investigations • Revisions to cumulative impact analysis • Other revisions based on technical comments
Chapter 31, *Other CEQA/NEPA Required Sections*	• Improvements to description/analysis level of detail • Other revisions based on technical comments

1.4 Revisions to be Included in the Final EIR/EIS

The Lead Agencies have identified a number of additional issues raised in public and technical review of the Draft EIR/EIS that do not warrant inclusion in the RDEIR/SDEIS but would be explained or addressed in the Final EIR/EIS revisions. As explained in Section 1.1.2, *Legal Basis for Recirculation*, the additional information and analyses in the RDEIR/SDEIS are included if they meet the CEQA definition of significant new information or NEPA requirements for preparing a supplement to the EIS. The following issues will be addressed in the Final EIR/EIS, but not in this RDEIR/SDEIS.

1.4.1 Comments and Responses on the Public Draft EIR/EIS

Comments received on the Draft EIR/EIS and all comments received on the RDEIR/SDEIS will be presented with responses in the Final EIR/EIS as required by CEQA and NEPA.

1.4.2 Additional Alternatives

The RDEIR/SDEIS includes revisions to Alternative 4 and new sub-alternatives, Alternatives 4A, 2D, and 5A in response to comments received on Alternative 4 in the Draft EIR/EIS and the change in ESA regulatory compliance approach. No other alternatives are included in the RDEIR/SDEIS because the original 15 action alternatives, along with Alternatives 4A, 2D, and 5A and the no action/no project alternative, meet CEQA and NEPA requirements to present and consider a reasonable range of alternatives to the proposed action. Draft EIR/EIS Appendix 3A, *Identification of Water Conveyance Alternatives, Conservation Measure 1*, and Appendix 3G, *Background on the Process of Developing the BDCP Conservation Measures*, discuss how alternatives were developed for inclusion in the Draft EIR/EIS. Responses to comments received on the adequacy of alternatives addressed in the Draft EIR/EIS will be provided in the Final EIR/EIS.

1.4.3 Comparison of Alternatives Summary

The Final EIR/EIS will include summary alternative comparison tables in the Executive Summary and resource chapters that compare selected impact information across all the alternatives presented in the Draft EIR/EIS and RDEIR/SDEIS.

1.4.4 Additional Discussion of Climate Change Uncertainties and Outcomes

A number of comments requested that additional information be provided presenting the reasoning for the Lead Agencies' decision to assume current operations and current regulations in the modeling for future SWP and CVP operations given the potential influence of climate change on future operations and in light of the requested 50 year permit assurances with the BDCP. An explanation and analysis describing potential scenarios for future SWP/CVP system operations and uncertainties will be provided in the Final EIR/EIS.

1.5 Format of the RDEIR/SDEIS

The RDEIR/SDEIS is organized as shown below. Note that main portions of the RDEIR/SDEIS are called *Sections* rather than *Chapters*. This is to distinguish references to chapters in the Draft EIR/EIS from references to other sections in the RDEIR/SDEIS.

Section 1, Introduction. This section contains an overview of the background and context and purpose for the RDEIR/SDEIS, a summary of contents and topics addressed and not addressed in the document, and the organization and public review process for the document.

Section 2, Substantive Draft EIR/EIS Revisions. This section provides narrative text describing the approach and consequences of the substantive revisions made in the RDEIR/SDEIS.

Section 3, Conveyance Facility Modifications to Alternative 4. This section provides a summary of the Alternative 4 revisions by resource chapter with references to Appendix A in-text revisions.

Section 4, New Alternatives: Alternatives 4A, 2D, and 5A. This section describes the new Alternatives 4A, 2D, and 5A actions, ESA compliance approach, and impacts and mitigation measures.

Section 5, Revisions to Cumulative Impact Analyses. This section presents analyses considering additional cumulative projects, and analyses and discussion of the California Water Action Plan, California EcoRestore and Sustainable Groundwater Management Act.

Section 6, List of Preparers. This section identifies the individuals who prepared the RDEIR/SDEIS.

Appendix A, Revisions to the Draft EIR/EIS. This appendix provides text changes and additions made to each applicable chapter and appendix of the Draft EIR/EIS, including revisions to Appendix 3B.

Appendix B, Supplemental Modeling Results for New Alternatives. This appendix provides additional CALSIM II, DSM2, and other modeling results referenced for Alternative 4A, 2D, and 5A operations impacts.

Appendix C, Supplemental Modeling Requested by the State Water Resources Control Board Related to Increased Delta Outflows. This appendix provides supplemental modeling for use in the State Water Board permit process.

Appendix D, Substantive BDCP Revisions. This appendix provides BDCP revisions that have been made following circulation of the Draft EIR/EIS and that are referenced in the RDEIR/SDEIS.

Appendix E, Supplemental Information for U.S. Army Corps of Engineers Permitting Requirements. This appendix provides additional information needed for USACE wetland, navigation, levee modification and cultural resources permitting processes.

Appendix F, Supplemental Modeling Results at ELT for Alternative 4. This appendix provides supplemental CALSIM II and DSM2 results for Alternative 4 at the early-long-term that describe H1 and H2 operations scenarios.

Appendix G, Alternative 4A (Proposed Project) Compatibility with the Delta Plan. This appendix discusses an approach that may be considered for Alternative 4A, the proposed project, to meet the Delta Plan Consistency requirements.

1.6 Public Review Process for RDEIR/SDEIS

This RDEIR/SDEIS is being noticed and circulated for public review, in the same manner as the draft documents that were issued for public review on December 13, 2013. The steps in the public review process are listed below.

- Prepare an NOA for the RDEIR/SDEIS for CEQA purposes and file it with the State Clearinghouse (already completed).
- Transmit published RDEIR/SDEIS to State Clearinghouse and EPA; EPA publishes an NOA in the Federal Register announcing availability and the review period for the revised documents (already completed).

- Provide notices of the revised document's availability in newspapers, in public locations, and to agencies and individuals (already completed).
- Circulate the RDEIR/SDEIS for no less than a 45-day public review period.

Following the close of the public review period, the lead agencies will:

- Consider and respond to all significant environmental issues raised in comments on the RDEIR/SDEIS (along with comments previously received on the Draft EIR/EIS).
- Incorporate revisions and response to comments into the Final EIR/EIS.

Following incorporation of supplemental information and response to comments into the final documents, the Final EIR/EIS will be circulated for a 30-day NEPA review period.

1.7 References

California Department of Water Resources. 2009. *California Water Plan Update 2009*. Bulletin 160-09. Available: < http://www.waterplan.water.ca.gov/cwpu2009/>. Accessed: June 10, 2013.

Delta Protection Commission. 2011. October 10, 2011. Public Draft (Revised). *Economic Sustainability Plan for the Sacramento-San Joaquin Delta*. Adopted by the Delta Protection Commission on October 25, 2011. Access date: January 25, 2012. Available: http://www.delta.ca.gov/res/docs/ESP_10_10_11.pdf.

Section 2
Substantive Draft EIR/EIS Revisions

The following sections provide a brief overview of the substantives changes and conclusions provided in the RDEIR/SDEIS. These changes in approach were made both in the Draft EIR/EIS which appears in this RDEIR/SDEIS as Appendix A, *Revisions to the Draft EIR/EIS*; and they are also carried forward in the analysis for Alternatives 4A, 2D, and 5A (which appear in Section 4 of this RDEIR/SDEIS). Appendix A includes modified excerpts of text that originally appeared in the Draft EIR/EIS, with underlining showing new language and strikeout showing eliminated text. Appendix A does not include Draft EIR/EIS text that was not changed or that may be modified in the Final EIR/EIR in a non-substantive manner, and is focused primarily nonimpact analysis revisions to Alternative 4, though other BDCP alternatives are addressed for some of the resources for various reasons. To give readers the best possible sense of the context in which such text changes occur, Appendix A includes section headings before and after modified passages, so that readers can understand precisely where within Draft EIR/EIS chapters the revisions occur. For a visual representation of how the document is laid out and how various segments relate to one another, please see the *Document Review Road Map* at the front of this document.

2.1 Fish and Aquatic Habitat Analyses

Draft EIR/EIS Chapter 11, *Aquatic Resources,* provided substantial information about the potential effects of the alternatives on fish and their habitats in the Plan Area and in upstream areas used by the evaluated species. Since release of the Draft EIR/EIS, the chapter has been revised to address design changes associated with the proposed project, to incorporate the latest engineering assumptions and modeling procedures, and to respond to comments raised by the public. Several comments requested elaboration on the methods used to arrive at CEQA conclusions and NEPA effects determinations and on the effects of contaminants. Additionally, commenters requested analyses of the effects on downstream bays (i.e., San Francisco Bay), and that all analyses include a NEPA conclusion. Since release of the Draft EIR/EIS, additional information has been developed pertaining to the following: the use of reusable tunnel material (RTM) for restoration efforts; the construction effects of the modification to Clifton Court Forebay; and the construction of an operable barrier at Head of Old River. This section briefly describes the revisions and their effects on the impact analysis. These revisions serve to better articulate the analysis of effects, but do not change the level of significance or magnitude of the effects. Please refer to the references to review specific sections of the revised chapter.

2.1.1 Methods Used

Several commenters noted that the analytical approach for determining the effects on fish and aquatic resources of various operational aspects of the alternatives was difficult to understand. This was especially related to the presentation of impacts for certain fish species that relied on multiple modeling results as evidence for CEQA conclusions and NEPA effects determinations. To better explain the rationale and process applied to the development of the CEQA conclusions and NEPA effects determinations, the methods section has been updated (Chapter 11, *Fish and Aquatic Resources,* Section 11.3.2, in Appendix A) to more explicitly describe for each species life stage what

methods were used and how the various modeling results were weighted. This approach was applied similarly for all alternatives. Additionally, information has been added to key impact analyses to articulate the biological linkages between changes in the physical environment and biological effects. Please refer to Chapter 11, *Fish and Aquatic Resources,* Section 11.3.2, in Appendix A.

2.1.2 Effects Downstream of the Plan Area

Chapter 11, *Fish and Aquatic Resources*, of the Draft EIR/EIS included a description of the potential changes in sediment loading as a result of the creation of new points of diversion under Alternatives 1A through 8. This analysis was used to inform the impacts related to turbidity (water clarity) for delta and longfin smelt. In summary, these impacts were deemed to be less than significant/not adverse because there would be less than a 10% change in sediment loading and because restoration actions could serve to increase turbidity in some areas. Additionally, as part of an environmental commitment in Appendix 3B, *Environmental Commitments*, in this RDEIR/SDEIS (similar to Avoidance and Minimization Measure [AMM] 6), sediments collected at the intake facilities and RTM excavated during construction activities could be reintroduced into the Delta at proposed restoration sites. (See in Appendix A of this RDEIR/SDEIS) Consequently, the overall effect in the Plan Area/Delta was determined to be only a minor degradation. Based on comments received from the public and additional study of the likely characteristics of RTM material, this environmental commitment and its parallel AMM have been revised to describe the anticipated feasibility of reuse of this material, as well as the applicable regulatory standards that any such material would be required to meet prior to its beneficial reuse. For text revisions to this commitment, please refer to Appendix A, *Draft EIR/EIS In-Text Chapter Revisions*, in this RDEIR/SDEIS, which includes an expanded and modified version of Draft EIR/EIS Appendix 3B, *Environmental Commitments*.

As part of this RDEIR/SDEIS, additional analyses have been conducted to take into account sea level rise, restoration sediment demand, and the effects of the creation of new points of diversion in order to better understand the magnitude of potential changes in sediment loading into the San Francisco Bay and other areas downstream of the Plan Area (generally the Delta, Suisun Marsh, and Yolo Bypass). A range of sediment demand from existing wetlands and restoration activities was combined with the sea level rise assumptions to understand the rate at which restored areas would act as sediment sinks in order to maintain elevation as sea levels rise. Relevant literature was used to determine the overall contribution of sediments from the Delta to the Bay, and a range of volumes of potential supplemental materials from both the diversion sediment collection process at the north Delta diversions and the RTM was developed based on current engineering estimates. This RDEIR/SDEIS includes an analysis of changes in sediment loading to the Bay for all of the alternatives, with specificity to operations-related effects and restoration-related effects.

In addition to the sediment analysis, further analysis was undertaken to assess the consequences, if any, of the relatively minor changes in operations proposed across alternatives compared with the consequences already described in the Draft EIR/EIS. This new analysis evaluated the potential changes in water quality, salinity, flows, temperatures, and other factors potentially affecting fish habitat and behavior downstream of the Plan Area. The analyses indicted that these characteristics would be essentially unchanged, especially given the highly dynamic tidal environment of the Bay and its connection to the Delta. This analysis is included for Alternative 4A in Section 4.3.7, *Fish and Aquatic Resources*, for Alternative 2D in Section 4.4.7, for Alternative 5A in Section 4.5.7, and for the

remainder of the alternatives in Chapter 11, *Fish and Aquatic Resources,* Section 11.3.5 in Appendix A of this RDEIR/SDEIS.

2.1.3 Selenium and Mercury

The analysis of selenium and mercury has been revised in three locations: revisions to Conservation Measure 12 *Methylmercury Management* and Avoidance and Minimization Measure 27 *Selenium Management* (see Appendix D); revisions to the CM4 tidal habitat contaminants analysis; and a new impact to specifically address effects of contaminants on fish as a result of change in operations (See Chapter 11, Impact AQUA-219 in Appendix A). Additional details on the mechanisms for mobilization of selenium and mercury into the food web and the potential for effects on aquatic resources have been added to the RDEIR/SDEIS, including details describing the uncertainties associated with the analytical methods. The conclusions regarding effects on water quality associated with BDCP water operations evaluated in Chapter 8, *Water Quality*, of the Draft EIR/EIS and the potential for effects on aquatic resources have been further evaluated, including details of the analytical methods, uncertainties and findings. This analysis is included as Impact AQUA-219, applicable to all alternatives in Chapter 11, *Fish and Aquatic Resources,* Section 11.3.5 in Appendix A.

In response to reviewers' concerns that proposed restoration in Yolo Bypass could be a significant source of mercury methylation, a comparison of existing sediment and water quality data to the modeled conditions following proposed restoration activities has been included. To address the potential for selenium mobilization resulting from BDCP restoration actions, AMM27 has been expanded with specific requirements included to reduce the potential for bioaccumulation in covered fish species. Updated water quality data have been integrated into the selenium quantitative modeling for water and fish tissue under BDCP water operations, and results have been updated in Chapter 11, as shown in Chapter 11, *Fish and Aquatic Resources,* Section 11.3.5 in Appendix A.

2.1.4 NEPA Determinations

A small number of NEPA determinations were, at the time of the Draft EIR/EIS, determined to be "uncertain," or no determination was made. These effects were related to effects of the alternatives on salmonid fish migrations through the project area, effects of outflow on delta smelt and longfin smelt, and contaminant effects on all species. As described above, substantial effort has been put forth to better understand and articulate the potential for selenium and mercury effects on fish as a result of both operations and restoration actions proposed under the alternatives. This effort has allowed a more certain determination for contaminants effects under NEPA, which have been determined to be not adverse across all alternatives:

- AQUA-8, Effects of contaminants associated with restoration measures on delta smelt
- AQUA-26, Effects of contaminants associated with restoration measures on longfin smelt
- AQUA-44, Effects of contaminants associated with restoration measures on Chinook salmon (winter-run ESU)
- AQUA-62, Effects of contaminants associated with restoration measures on Chinook salmon (spring-run ESU)
- AQUA-80, Effects of contaminants associated with restoration measures on Chinook salmon (fall-/late fall–run ESU)

- AQUA-98, Effects of contaminants associated with restoration measures on steelhead
- AQUA-116, Effects of contaminants associated with restoration measures on Sacramento splittail
- AQUA-134, Effects of contaminants associated with restoration measures on green sturgeon
- AQUA-152, Effects of contaminants associated with restoration measures on white sturgeon
- AQUA-170, Effects of contaminants associated with restoration measures on Pacific lamprey
- AQUA-188, Effects of contaminants associated with restoration measures on river lamprey
- AQUA-206, Effects of contaminants associated with restoration measures on non-covered aquatic species of primary management concern)

Regarding effects on salmonid migrations, uncertainty stemmed from contrasting model results for upstream flow conditions and effects of the north Delta diversion operations. Additional examination of modeling results, showing mixed conclusions for Alternative 4, indicates that it was modeling assumptions and not actual real-world changes in operations or criteria, that shifted the timing of releases from Lake Shasta, generating the mixed results for the upper Sacramento River. Additional coordination with NMFS and CDFW to develop the ability to make real-time adjustments to minimize effects on fish migrating past the intakes has resulted in greater confidence pertaining to migration effects. The analysis of Alternative 4A in Section 4.3.7, *Fish and Aquatic Resources*, Alternative 2D in Section 4.4.7 and Alternative 5A in Section 4.5.7 describe the analysis and determination of this effect, and the remainder of the alternatives are described in Chapter 11, *Fish and Aquatic Resources,* Section 11.3.5 in Appendix A.

2.1.5 Clifton Court Forebay Modification, Head of Old River Operable Barrier Construction, and Pile Driving Effects

The Draft EIR/EIS included relatively little discussion of the impacts on fish and aquatic resources from construction of the modified Clifton Court Forebay and the Head of Old River operable barrier under Alternatives 4. The main assumptions related to construction of these facilities were provided in Appendix 3C of the Draft EIR/EIS, and consideration and analysis of potential effects is provided in this RDEIR/SDEIS. The potential sources of effects on fish from these activities are similar to those discussed for construction of north Delta diversions and barge landing sites: temporary increases in turbidity; accidental spills; disturbance of contaminated sediments; underwater noise; fish stranding; in-water work activities; loss of spawning, rearing, or migration habitat; and predation. The impacts from construction of the modified Clifton Court Forebay and the Head of Old River operable barrier would be rendered less than significant by application of appropriate AMMs and mitigation measures.

The effects of underwater noise caused by pile driving were reassessed to account for changes in the proposed construction approach as outlined in Appendix 3C, *Construction Assumptions*, of the Draft EIR/EIS. While the in-water work windows of July through October were maintained (see Tables 22B-1a through 22B-4d in Appendix 22B, *Air Quality Assumptions*, of the Draft EIR/EIS), the analysis was conducted assuming more concurrent pile-driving and without the use of attenuation structures. This analysis is included in Section 4.3.7, Fish and Aquatic Resources for Alternative 4A,

Section 4.4.7 for Alternative 2D, Section 4.5.7 for Alternative 5A, and Chapter 11, *Fish and Aquatic Resources*, Sections 11.3.1.1 and 11.3.5, in Appendix A of the RDEIR/SDEIS for all other alternatives.

2.1.6 Non-Covered Fish Entrainment at the North Delta Diversion

The Draft EIR/EIS did not include a detailed analysis of the potential entrainment effects on non-covered aquatic species of primary management concern that have pelagic early life stages and therefore may be particularly susceptible to entrainment at the proposed north Delta diversions (i.e., egg and larval striped bass and American shad). An analysis has been included in this RDEIR/SDEIS to assess the potential for effects on these species because much of their spawning could occur upstream of the proposed north Delta intake locations, thus potentially subjecting eggs or larvae to entrainment. The analysis examines particle tracking model results from the Sacramento River upstream of the north Delta diversions. This impact analysis, and discussion of its relevance, is included in Chapter 11, Section 11.3.5, Impact AQUA-201, in Appendix A, and is applicable to all of the alternatives.

2.2 Water Quality Revisions

Chapter 8, *Water Quality*, of the Draft EIR/EIS evaluates effects on water quality from construction and operation of the proposed water conveyance facility (CM1) for Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9. Water quality impacts from other conservation measures (CM2–CM21) for these alternatives are evaluated at the programmatic level. Chapter 8 has been revised since release of the Draft EIR/EIS to address design changes associated with the proposed project, to include additional analysis, to make clarifications and correct errors, to update analyses based on more recent water quality data and/or criteria, and to respond to comments raised by local, state, and federal agencies and the public. Water quality constituent sections that received the most updating were electrical conductivity, chloride, selenium, bromide, and *Microcystis*. Additionally, an assessment of constituent effects downstream of the Plan Area (i.e., in San Francisco Bay) was added. Several other modifications and additions were made to the assessments for mercury, nutrients, trace metals, and dissolved oxygen. This section briefly describes the revisions to Chapter 8 and their effects on the impact analyses and impact determinations. Please refer to the document links to review specific sections of the revised chapter.

Additionally, three new alternatives – Alternative 2D, 4A, and 5A – were evaluated for effects on water quality from construction and operation of the water conveyance facility (CM1) and from other Environmental Commitments (CM 3, 4, 6, 7, 9–12, 15, and 16). The Alternatives evaluated in Chapter 8 discussed above contain many similarities to each other from a water quality perspective, and thus are often grouped together in the following discussion. The three new alternatives are also very similar to each other, but from a water quality perspective, are fundamentally different than the Alternatives evaluated in Chapter 8 that are discussed above, in that they contain substantially less tidal restoration acreage. Although this section is focused on describing changes made in Chapter 8 from the Draft EIR/EIS, differences between the alternatives assessed in Chapter 8 and the three new alternatives are highlighted where appropriate.

2.2.1 Electrical Conductivity and Chloride

In the Draft EIR/EIS, all project alternatives (1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9) were found to have significant and unavoidable impacts on electrical conductivity and chloride in the Delta. These impacts were due in part to apparent exceedances of Bay Delta Water Quality Control Plan D-1641 water quality objectives shown in the modeling results at several locations under Existing Conditions, the No Action Alternative, and BDCP Alternatives. It was known that there are several factors related to the modeling approach that may result in modeling artifacts that show objective exceedance when, in reality, no such exceedance would occur. Appendix 8H Section 8H.1 of the Draft EIR/EIS described some of these factors, but the document did not include an evaluation of how many of these exceedances were thought to be a result of these factors and how many were expected to be actual project impacts. Furthermore, in the Draft EIR/EIS, mitigation measures for electrical conductivity and chloride called for additional modeling efforts to determine if impacts could be avoided or mitigated.

For chloride, most project alternatives evaluated in the Draft EIR/EIS were considered to have significant and unavoidable impacts in the Delta for the following reasons:

- modeling results showed exceedance of the 150 mg/L chloride objective,
- substantial increases in chloride were occurring in Suisun Marsh, and
- water quality degradation was occurring in the western Delta due to increased chloride concentrations.

For electrical conductivity, most alternatives evaluated in the Draft EIR/EIS were considered to have significant and unavoidable impacts for the following reasons:

- modeling results showed exceedance of the agricultural objective in the Sacramento River at Emmaton,
- modeling results showed exceedance of the agricultural objective in the San Joaquin River at San Andreas Landing,
- modeling results showed exceedance of the fish and wildlife objective between Prisoners Point and Jersey Point,
- modeling results showed exceedance of the agricultural objective in Old River at Tracy Bridge,
- substantial increases in EC were occurring in Suisun Marsh, and
- water quality degradation was occurring in the western Delta due to increased EC.

To address some of these issues, since publication of the Draft EIR/EIS, the Lead Agencies conducted sensitivity analyses and other analyses to evaluate whether exceedances were modeling artifacts (and thus would not occur) or were potential project-related impacts (which could occur). These included modeling runs investigating the impact of the following:

- Changing the existing Emmaton electrical conductivity compliance location to a new location at Threemile Slough, as proposed in the version of the BDCP circulated with the Draft EIR/EIS.
- Monthly-daily patterning at the Delta boundary locations (see Section 8.3.1.1 in Appendix A for a description of monthly-daily patterning), including the Suisun Marsh Salinity Control Gates, under the alternatives.

- Removing tidal restoration areas (i.e., assuming no tidal restoration, as opposed to the tidal restoration areas that were previously assumed under Alternative 4 at the late long-term) as a means of understanding the contribution of restoration vs. CM1 to exceedances.
- Revising Head of Old River Barrier operations during April and May.

Additionally, evaluation of individual exceedances was conducted in some cases to determine whether modeling time step and averaging, model imprecision, or imperfections in the Artificial Neural Network played a role in each exceedance shown by the modeling.

The findings and outcomes of the sensitivity analyses were the following.

- Regarding exceedances of the Sacramento River at Emmaton EC objective for protection of agricultural beneficial uses (which is a maximum 14-day running average of mean daily EC and applies April 1 through August 15, but varies in the specific numeric threshold by water year type and season), assuming the electrical conductivity compliance location at Emmaton instead of Threemile Slough greatly decreased exceedances of this objective at Emmaton to levels similar to those occurring under the No Action Alternative. Based on this finding, the project description for Alternative 4 was modified to remove the change in compliance point for the Emmaton electrical conductivity objective. Previously, the project descriptions for all action alternatives included a change in compliance point from Emmaton to Threemile Slough. The revised version of Alternative 4 would maintain, and not propose to change, the existing compliance point at Emmaton, while all other alternatives assessed in the Draft EIR/EIS (1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, and 9) still include the proposed change to Threemile Slough. With this change, Alternative 4 no longer shows a significant impact with respect to the Bay-Delta WQCP EC objective exceedance at Emmaton, while all other alternatives assessed in the Draft EIR/EIS (1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, and 9) still show significant impacts due to EC objective exceedance at Emmaton. The three new Alternatives assessed in this RDEIR/SDEIS (4A, 2D, 5A) also maintain the existing compliance point at Emmaton, and thus, for the reasons discussed above, do not show significant impacts due to EC objective exceedance at Emmaton.
- Regarding exceedances of the San Joaquin River at San Andreas Landing EC objective for protection of agricultural beneficial uses (which is a maximum 14-day running average of mean daily EC and applies April 1 through August 15, but varies in the specific numeric threshold by water year type and season), some of the modeled exceedances were found to be modeling artifacts due to monthly-daily patterning effects (see Section 8.3.1.1 in Appendix A for a description of monthly-daily patterning), and the small number of remaining exceedances were small in magnitude, lasted only a few days, and could be avoided or otherwise satisfactorily addressed with real time operations of the SWP and CVP (see Chapter 8, Section 8.3.1.1 in Appendix A for a description of real time operations of the SWP and CVP). Based on these findings, all project alternatives (those assessed in the Draft EIR/EIS, as well as the new alternatives) no longer show significant impacts with respect to EC objective exceedance at San Andreas Landing.
- Regarding exceedances of the San Joaquin River between Prisoners Point and Jersey Point EC objective (which is a maximum 14-day running average of mean daily EC of 0.44 mmhos/cm and applies April through May of all but critical water years), removing tidal restoration areas (i.e., assuming no tidal restoration, as opposed to the tidal restoration areas that were previously assumed under Alternative 4 at the late long-term) reduced the number of exceedances, but

there were still substantially more exceedances than under Existing Conditions or the No Action Alternative. Results of the sensitivity analyses indicate that the exceedances are partially a function of the operations of the alternative itself, perhaps due to Head of Old River Barrier assumptions and south Delta export differences. Appendix 8H Attachment 2 was added, which contains a more detailed assessment of the likelihood of these exceedances impacting aquatic life beneficial uses. Specifically, Appendix 8H Attachment 2 discusses whether these exceedances might have indirect effects on striped bass spawning in the Delta, and concludes that the high level of uncertainty precludes making a definitive determination. Thus, although uncertain, significant impacts on EC remain relative to this objective for Alternatives 2, 4, 6, 7, and 8. The physical effects and beneficial use at issue here relate to how suitable this stretch of the San Joaquin River is for spawning of striped bass, a nonnative species that preys on the Delta smelt. No such significant effects occur for Alternatives 1, 3, 5, and 9. Alternative 2D and 4A are expected to result in fewer and lower magnitude exceedances of this objective due to the lower acreage of tidal restoration, but to ensure that the objective is met, mitigation measures were introduced that would adaptively manage the split between North and South Delta intake diversions and Head of Old River Barrier operations. With the introduction of this mitigation measure, Alternatives 2D, 4A, and 5A do not show significant impacts with respect to EC objective exceedances at Prisoners Point.

- Regarding exceedances of the Old River at Tracy Bridge EC objective for the protection of agricultural beneficial uses (which is a maximum 30-day running average of mean daily EC of 0.7 mmhos/cm April through August and 1.0 mmhos/cm September through March), some of these exceedances were found to be modeling artifacts due to monthly-daily patterning effects (see Section 8.3.1.1 in Appendix A for a description of monthly-daily patterning), and the remaining exceedances could be resolved by assuming the continuation of historical dry year practices of installing barriers earlier in the year. Thus, no significant (CEQA) or adverse (NEPA) effects would occur. Furthermore, as noted in Chapter 8, Section 8.1.3.7 of Appendix A, SWP and CVP operations have relatively little influence on salinity levels at these locations, and the elevated salinity in south Delta channels is affected substantially by local salt contributions discharged into the San Joaquin River downstream of Vernalis.

- Modeling of all alternatives assumed no operation of the Suisun Marsh Salinity Control Gates, but the project description for all alternatives now assumes continued operation of the Salinity Control Gates, consistent with assumptions included in the No Action Alternative. A sensitivity analysis with the gates operational consistent with the No Action Alternative resulted in substantially lower EC levels in Suisun Marsh than indicated in the original modeling results, but EC levels were still somewhat higher there than EC levels under Existing Conditions and the No Action Alternative for several locations in the Marsh and for several months. Another modeling run with the gates operational and restoration areas removed resulted in EC levels nearly equivalent to those found in Existing Conditions and the No Action Alternative, indicating that design and siting of restoration areas has notable bearing on EC levels at different locations within Suisun Marsh. These analyses also indicate that increases in EC levels shown in the modeling conducted for the Draft EIR/EIS were related primarily to the hydrodynamic effects of CM4 under the alternatives assessed (1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9), not operational components of CM1. Based on the sensitivity analyses, optimizing the design and siting of restoration areas for these alternatives consistent with proposed environmental commitments, avoidance and minimization measures, and mitigation measures is expected to be able to reduce EC increases, relative to Existing Conditions and the No Action Alternative, to levels that would be less than significant. Mitigation Measure WQ-11d discusses these actions.

All of the same applies to chloride levels in Suisun Marsh, and Mitigation Measure WQ-7d discusses these actions. The new alternatives 2D, 4A, and 5A, contain much lower acreage of tidal restoration, and thus are anticipated to not have significant impacts with respect to EC and chloride in Suisun Marsh.

The assessment of exceedances of the Bay Delta WQCP 150 mg/L chloride objective in the Draft EIR/EIS was also revised based on discovery of errors made in the original analysis. The Bay-Delta WQCP contains a chloride objective for Contra Costa Canal at pumping plant #1 or the San Joaquin River at Antioch Water Works intake that specifies the number of days each calendar year that the maximum mean daily chloride concentration must be less than 150 mg/L (must be provided in intervals of not less than 2 weeks' duration). The days per year depend on water-year type, ranging from 155 days for critical water-year types to 240 days in wet water-year types. In the original analysis, the predicted exceedances of this objective were based on the number of days in a calendar year that chloride is below certain specified limits at these locations. The DSM2 water quality model projects future conditions based in part on a representative recent 16-year time period reflecting varying hydrological conditions in California (i.e., water years 1976–1991). DSM2 was run for 16 *water* years (water years 1976–1991, i.e., October 1, 1975 – September 30, 1991), which only includes 15 complete *calendar* years (1976–1990). The final calendar year of the DSM2 simulation, 1991, was inadvertently included in the compliance assessment, even though modeling for 1991 did not include the whole calendar year, but stopped at the end of water year 1991 (i.e., September 30). This resulted in reporting of exceedances of the objective for calendar year 1991, when in fact the modeling results do not exist to determine if the objective was exceeded. Specifically, starting at the beginning of the calendar year, the compliance assessment algorithm keeps a running total of the number of days that meet the water quality criterion, then reports the total number of days in that year that met the criterion, and that number of days is compared to the required number of days from the water quality objective. Since modeling ended September 30, 1991, the last year only had 273 days available for counting, instead of the full 365. The minimum required number of days was usually not achieved for this year, so it was denoted as an exceedance of the objective. However, had the full 365 days been available, compliance with the objective may have occurred—the modeling results do not exist to determine this issue. The assessment was revised to remove calendar year 1991, so assessment was based on calendar years 1976–1990 of the original modeled results (i.e., 15 years instead of 16), and the impact conclusions were updated accordingly. Correcting of this error resulted in a more accurate assessment, and resulted in fewer exceedances of the objective under the project alternatives assessed in the Draft EIR/EIS (1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9) than previously indicated. The specific number of exceedances predicted under the revised approach varied by alternative, and for some alternatives remained a significant impact. The new alternatives 2D, 4A, and 5A, did not contain any exceedances of this objective, likely in part due to the lower acreage of tidal restoration included in these alternatives.

Another issue that was resolved involved application of the correct water quality objectives based on the water year type appropriate to the modeled time step. As discussed above, the Draft EIR/EIS contained an assessment of compliance with Bay Delta Water Quality Control Plan electrical conductivity and chloride water quality objectives based on outputs from the DSM2 model. The modelling projects future conditions based in part on a representative recent 16-year time period reflecting varying hydrological conditions in California (i.e., water years 1976–1991). Some of the Water Quality Control Plan objectives are dependent on water year type (e.g., wet or dry). The water year type is a designation used to denote the water supply or water availability for a given water year, and is based on a formula that includes estimates of the unimpaired runoff in the Sacramento

River watershed. For each water year of the DSM2 simulation used (water years 1976–1991), the water year type that was used to define the objective was the water year type that was assigned under Existing Conditions hydrologic conditions. However, climate change assumptions alter the timing and magnitude of unimpaired runoff estimates, which alter the water year types assigned to the years in the DSM2 simulation. Because of this, 3 of the 16 water years in the simulation change their type in the late long term as a result of climate change. Thus, for the late long term scenarios, compliance should have been based on the objective defined according to the late long term water year types, not the Existing Conditions water year types. This change was made and the compliance assessment tables were updated. In general, this change resulted in the modeled predicted percent of days out of compliance increasing by 0–5% in both the No Action and the project alternatives, depending on the alternative and water quality objective evaluated. However, these changes did not fundamentally alter any of the impact conclusions at these sites.

Finally, understanding the uncertainties and limitations in the modeling and assessment approach is important for interpreting the results and effects analysis, including assessment of compliance with water quality objectives. Please refer to Chapter 8, Section 8.3.1.1, *Models Used and Their Linkages*, and Section 8.3.1.3, *Plan Area*, in Appendix A for a description of these limitations. In light of these limitations, the assessment of compliance was conducted in terms of assessing the overall direction and degree to which Delta EC or chloride would be affected relative to a baseline, and discussion of compliance did not imply that the alternative would literally cause Delta chloride to be out of compliance a certain period of time. In other words, the model results are to be used in a comparative mode, not a predictive mode. Furthermore, in reality, staff from DWR and Reclamation constantly monitor Delta water quality conditions and adjust operations of the SWP and CVP in real time as necessary to meet water quality objectives. These decisions take into account real-time conditions and are able to account for many factors that even the best available models cannot simulate. Thus, it is likely that some objective exceedances simulated in the modeling would not occur under the real-time monitoring and operational paradigm that will be in place to prevent such exceedances.

Based on the findings of all of the analyses discussed above, results of the electrical conductivity and chloride assessments were qualified, and the impact determinations were revisited. Additionally, because these efforts shed light on why certain exceedances were occurring, it was possible to revise mitigation measures to better address the causes of the exceedances. All alternatives assessed in the Draft EIR/EIS (1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9), remained significant and unavoidable for chloride and EC, but the reasons are now only the following:

- Exceedance of water quality objectives for EC in the Sacramento River at Emmaton (Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, 8, and 9 – but not Alternative 4)
- Water quality degradation in the western Delta due to increased chloride concentrations and EC (Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9), and
- Exceedances of the fish and wildlife EC objective between Prisoners Point and Jersey Point (Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9).

Thus, although the impacts remain significant and unavoidable, the magnitude of the impacts is substantially less than was indicated in the Draft EIR/EIS.

Alternatives 2D, 4A, and 5A did not contain significant impacts for EC related to objective exceedance in the Sacramento River at Emmaton, did not contain substantial degradation in the western Delta due to increased chloride concentrations, had less water quality effects in the western

Delta related to EC, and fewer exceedances of the fish and wildlife EC objective between Prisoners Point and Jersey Point, such that it was feasible to introduce mitigation that would prevent significant impacts related to EC increases. After introduction of these mitigation measures, Alternatives 2D, 4A, and 5A contained less than significant impacts for EC. Alternatives 2D, 4A, and 5A contained less than significant impacts for chloride as well.

Refer to Chapter 8, *Water Quality*, Sections 8.1.3.4 and 8.3.1.7 in Appendix A for a discussion of historical compliance with chloride and electrical conductivity objectives, respectively. Refer to Chapter 8, *Water Quality*, Section 8.3.1.7 (*Chloride* and *Electrical Conductivity* subsections) in Appendix A for a discussion of the change in water year types at different time steps and sensitivity analyses performed. Refer to Mitigation Measures WQ-7 and WQ-11 in Sections 8.3.3.1 through 8.3.3.16 in Appendix A for the assessment and mitigation measures, which have been updated to account for water year type changes, sensitivity analyses performed, additional context, and corrections to the chloride 150 mg/L objective assessment; and to Appendix 8G and 8H in Appendix A for updated information supporting changes to the assessment. Refer to Section 4 and associated material in Appendix B for the assessment of Water Quality for Alternatives 4A, 2D, and 5A.

2.2.2 Selenium

Modeling for selenium (water concentrations and bioaccumulation modeling) was updated on the basis of a review and update of Delta source water concentrations of selenium. Public comments on the Draft EIR/EIS indicated that the source water concentrations for both the Sacramento River and San Joaquin River were likely biased high (i.e., the modeling approach used concentrations for both rivers that indicated more selenium than is currently actually present in the rivers). This bias was due to inclusion of older monitoring data that used higher detection limits (on both rivers), as well as to the decrease of selenium concentrations on the San Joaquin River that has occurred over time. The source water concentrations for the Sacramento River, San Joaquin River, Yolo Bypass, and San Francisco Bay were reevaluated and re-derived using the most recent data available, and the water concentration and bioaccumulation modeling was updated based on these updated source water concentrations. Results showed that there was generally a greater increase from Existing Conditions and No Action concentrations to the concentrations under the alternatives than previously predicted (i.e., the relative effect of the project was greater). However, the absolute values of all of the estimated concentrations for Existing Conditions, the No Action Alternative, and all Project Alternatives were lower than modeled previously in the Draft EIR/EIS, and thus were lower relative to thresholds of concern and water quality criteria used in the assessment.

The bioaccumulation modeling methodology for bass in the Delta was also updated. Bioaccumulation modeling is dependent on the choice of K_d, the ratio of selenium concentration in particulates vs. water. The higher the value of K_d, the greater the bioaccumulation of selenium. Previously, the choice of K_d was "static" for both bass and sturgeon, and did not vary by location or concentration of selenium in the water. The model was updated for bass based on more recent understanding that K_d tends to be higher at lower water concentrations than at higher concentrations. The result of this change is that predicted bass tissue concentrations in the Delta are more consistent across location and Alternative than was determined in the Draft EIR/EIS. This update could not be made for sturgeon bioaccumulation modeling because there was insufficient monitoring data with which that model could be calibrated for such a change.

Numeric thresholds used in the selenium assessment were also updated. Current ambient water quality criteria are based on waterborne selenium concentrations, but EPA released draft water

quality criteria for the protection of freshwater aquatic life from toxic effects of selenium in May 2014. The draft criteria include tissue-based concentrations, which are most closely associated with reproductive effects. The criteria also include water concentrations, which are to be used when fish tissue data is not available. The draft criteria have not been finalized, but they represent the most current science on numeric thresholds protective of beneficial uses. Accordingly, these draft criteria were used in the updated assessment. Specifically, the whole-body fish tissue threshold was lowered from 9 mg/kg to 8.1 mg/kg. Additionally, the criterion against which water concentration changes were compared was lowered from 2 µg/L to 1.3 µg/L, which is the EPA draft criterion for lentic (i.e., still or slow-moving) water bodies.

An expanded discussion of residence time in the Delta and its effect on selenium bioaccumulation in the Delta was added in response to agency comments. Increased water residence times could increase the bioaccumulation of selenium in biota, thereby potentially increasing fish tissue and bird egg concentrations of selenium. However, if increases in fish tissue or bird egg selenium were to occur due to residence time changes alone, the increases would likely be of concern only where fish tissues or bird eggs are already elevated in selenium to near or above thresholds of concern. That is, where biota concentrations are currently low and not approaching thresholds of concern, changes in residence time alone would not be expected to cause them to then approach or exceed thresholds of concern. Based on the analysis, the most likely area in which biota tissues would be at levels high enough that additional bioaccumulation due to increased residence time from restoration areas would be a concern is the western Delta and Suisun Bay for sturgeon. Nevertheless, estimates of residence time increases in these areas are small enough that they are not expected to substantially affect selenium bioaccumulation in the western Delta.

The changes discussed above did not result in any changes to the impact conclusions. Alternatives 6-9 remain adverse (under NEPA) and significant and unavoidable (under CEQA) due to modeled substantial increases in fish tissue concentrations for sturgeon in the western Delta, while Alternatives 1–5 remain less than significant.

Refer to Chapter 8, *Water Quality*, Section 8.1.3.15 in Appendix A for updated existing selenium concentrations in the affected environment and a description of the EPA draft criteria. Refer to Section 8.3.1.7 in Appendix A for the updated source water concentrations used in the modeling and updated thresholds used in the assessment. Refer to Impact WQ-25 in Sections 8.3.3.1 through 8.3.3.16 in Appendix A for the selenium assessment updated based on the new modeling. Further details on the updates can be found in Appendix 8M, *Selenium*, in Appendix A.

2.2.3 Bromide

Additional description was added to describe more fully the CALFED bromide goal used in the assessment. Specifically, the additions describe the background behind derivation of the EPA bromate maximum contaminant level (MCL), its relevance to the CALFED numeric bromide goals, and the non-numeric portion of the CALFED goal regarding an equivalent level of public health protection using a cost-effective combination of alternative source waters, source control, and treatment technologies.

Additional descriptions regarding modeling uncertainty and assumptions were also added. Specifically, these address assumptions regarding sea level rise and the assumed footprint and design of restoration areas, and the performance and accuracy of DSM2 in the Barker Slough area.

Sensitivity analyses were conducted to evaluate what factors were causing or contributing to bromide increases in Barker Slough. Findings from these analyses were incorporated into the assessment, and mitigation measures were revised to better address the factors contributing to the increases. With regard to bromide, all alternatives assessed in the Draft EIR/EIS (1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9) remain adverse (under NEPA) and significant and unavoidable (under CEQA). However, it is now known that the cause of the modeled increases in bromide in Barker Slough, which was driving the impact determinations for almost all alternatives, is assumptions regarding CM4 implementation, not operations in CM1. Thus the mitigation measure was revised to more appropriately address actions that could lessen the projected impact, based on these findings.

Because the new alternatives (2D, 4A, and 5A) contain a lower acreage of tidal restoration, significant impacts with regards to bromide are not expected under these alternatives.

Refer to Chapter 8, *Water Quality*, Section 8.1.3.3, 8.3.1.7, and Impact WQ-5 in Sections 8.3.3.1 through 8.3.3.16 in Appendix A for the bromide additions and revisions.

2.2.4 Mercury

Modeling results and findings for Impact WQ-13 under Alternative 8 were revised and updated. Specifically, results for water column and fish tissue methylmercury under Alternative 8 contained in the Draft EIR/EIS were inadvertently based on erroneous source water concentrations for methylmercury; accordingly, these were corrected and the modeling rerun. These corrections lowered the concentrations predicted under Alternative 8, but did not change the assessment conclusions. Alternative 8 previously contained an adverse (under NEPA) and significant and unavoidable impact (under CEQA) on mercury and methylmercury, and while the magnitude of the impact is now lower, it remains adverse and significant and unavoidable due to substantial increases in modeled methylmercury concentrations in multiple locations throughout the Delta.

Additional information regarding the uncertainty inherent in the mercury bioaccumulation modeling approach was added to Appendix 8I of Appendix A and referenced in the assessment. This information is important when interpreting smaller increases or decreases in fish tissue mercury levels that were estimated via the models. Refer to Chapter 8, *Water Quality*, Section 8.3.3.15, Impact WQ-13 in Appendix A for the updated Alternative 8 mercury assessment. Refer to Appendix 8I of Appendix A for the discussion of model uncertainty.

The three new alternatives – Alternative 2D, 4A, and 5A – differed from the alternatives assessed in the Draft EIR/EIS (1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9) in their evaluation of effects on mercury from other environmental commitments (CM 3, 4, 6, 7, 9–12, 15, and 16). The three new alternatives contain substantially less tidal restoration acreage than those in the Draft EIR/EIS. Thus, although the potential types of effects on mercury resulting from implementation of the environmental commitments under the new alternatives would be generally similar to those described for alternatives assessed in the Draft EIR/EIS, the magnitude of effects on mercury and methylmercury at locations in the Delta related to habitat restoration would be considerably lower.

It is not expected that the level of tidal restoration proposed under Alternatives 2D, 4A, and 5A would cause fish tissue concentrations to increase, at a measurable level, outside of the immediate localized area of the tidal restoration sites. However, habitat restoration has the potential to increase water residence times and increase accumulation of organic sediments that are known to enhance methylmercury bioaccumulation in biota in the vicinity of the restored habitat areas. Fish

tissue concentrations in the Delta already frequently exceed the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins objective of 0.24 mg/kg for trophic level 4 fish in the Delta. The proposed tidal restoration may cause or contribute to increased fish tissue concentrations at a local level, though the magnitude of the increase is not quantifiable. The Basin Plan also includes methylmercury allocations for wetlands for various areas of the Delta. Because the proposed tidal restoration acreage is very small, it is possible that, relative to the allocations, the increased loading would be very small. However, it is still unknown how and if the allocations can be attained. The Basin Plan also requires that for many areas of the Delta (i.e., those needing reductions in methylmercury), proponents of wetland restoration projects shall (a) participate in Control Studies, or implement site-specific study plans, that evaluate practices to minimize methylmercury discharges, and (b) implement methylmercury controls as feasible. Design of restoration sites would be guided by Environmental Commitment 12, which requires development of site-specific mercury management plans as restoration actions are implemented to minimize methylmercury production. The effectiveness of minimization and mitigation actions implemented according to the mercury management plans is not known at this time, although the potential to reduce methylmercury concentrations exists based on current research.

Although this would constitute a potential environmental impact, these increases would not be expected to cause injury to downstream water rights holders or other downstream water users, because effects would be localized to the restoration sites. Nor would such localized impacts adversely affect any other downstream beneficial users.

2.2.5 Microcystis

Assessment of the effects of the project on *Microcystis aeruginosa*, a nuisance and toxic cyanobacteria species, was added to the chapter. This section was added in response to public comments, as well as in recognition of the existing threat to water quality that *Microcystis* poses. In part because it is not technically a water quality constituent, and in part due to the lack of state or federal water quality standards, *Microcystis* did not appear in the screening analysis that was performed (Appendix 8C). Due to the combined effects of increased temperatures due to climate change (not related to the project) and increased residence times in the Delta (due primarily to the project related effects of CM1 and CM4), effects of project alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, and 9 on Microcystis were considered adverse (under NEPA) and significant and unavoidable (under CEQA). Mitigation measure WQ-32 was created to attempt to lessen the effects of the alternatives on Microcystis.

Because the new alternatives (2D, 4A, and 5A) contain a lower acreage of tidal restoration, residence times are not expected to increase as substantially as under the other alternatives, and thus significant impacts with regards to *Microcystis* are not expected under these alternatives, relative to the No Action Alternative.

Refer to Chapter 8, *Water Quality*, Section 8.1.3.18 for a description of the existing conditions regarding Microcystis, Section 8.3.1.7 for methodological considerations used in the assessment, and Impacts WQ-33 and WQ-34 in Appendix A for the Microcystis assessment.

2.2.6 Potential Seaward Effects of the BDCP

The western seaward boundary of the BDCP Plan Area has been delineated at Carquinez Strait. There are no actions in the BDCP proposed to occur in the bays seaward of the Plan Area. Thus, the

analysis in the Draft EIR/EIS focused on assessing the alternatives' effects on water quality in the upstream of the Delta Region, within the Plan Area, and in the SWP/CVP Export Service Areas. However, public and agency comments raised questions regarding water quality effects of the alternatives in the bays seaward of Carquinez Strait. Because net flows move seaward from the Delta toward the bays, water quality constituents present in the Delta water column could potentially be transported seaward. New screening and assessment of water quality constituent effects in San Francisco Bay was conducted in response to these concerns. These new assessments, which are reflected in new text added to the original Draft EIR/EIS analysis of Water Quality, did not identify any new adverse or significant impacts or any substantial increase in the severity of previously identified impacts, except in the case of selenium. For alternatives 6-9, projected increases in selenium loading and concentrations in North San Francisco Bay were considered adverse (under NEPA) and significant and unavoidable (under CEQA), while alternatives 1–5 were considered not adverse and less than significant. This is consistent with findings for the assessment of selenium in the Delta, in which the same conclusions were reached for the same alternatives. The driving factor for the adverse impacts under alternatives 6–9 in both the western Delta and the North Bay is modeled increases in selenium concentrations and loading, leading to potentially higher body burdens of selenium in certain species.

Refer to Appendix 8O, *SF Bay Analysis Tables*, in Appendix A for the assessment of seaward water quality effects of the alternatives.

2.2.7 Modeling and Methods Descriptions

The existing section describing models and methods used in the analysis was revised and expanded. Several public comments and comments by agencies requested more thorough discussion of modeling accuracy and uncertainty. In the Draft EIR/EIS, this type of information was sometimes included only through reference to Appendix 5A, and in other cases it was not in the documentation at all. As a result, many readers apparently did not see, or could not find, the relevant information. Additionally, to provide context for electrical conductivity and chloride compliance results, a description of how CALSIM and DSM2 were used to conduct this analysis was necessary. The addition of this material to Chapter 8 improves the analysis by putting results into their proper context regarding the overall uncertainty in the modeling approaches, including both the accuracy and precision of the model output, as well as the validity of input assumptions.

Refer to Chapter 8, *Water Quality*, Section 8.3.1.1, and 8.3.1.3 in Appendix A for the expanded and revised description of models used and their linkages.

2.2.8 Dissolved Oxygen

Following publication of the Draft EIR/EIS, concerns were raised that the project may increase flows on the San Joaquin River at Stockton, causing the location of the minimum DO point to shift downstream. To assess this possibility, flows in San Joaquin River at Stockton were evaluated in light of the above information.

The analysis showed that in most cases, flows in the San Joaquin River at Stockton actually decreased by a small amount. Reports indicate that the aeration facility performs adequately under the range of flows from 250–1,000 cfs (ICF International 2010). Based on the analysis, the expected changes in flows in the San Joaquin River at Stockton were not expected to substantially move the point of minimum DO, and therefore the aeration facility would likely still be located appropriately

to keep DO levels above minimum basin plan objectives. Since the aerators are assumed to be operated under the alternatives, just as in the Existing Conditions and No Action Alternative, effects of the alternatives on DO remained less than significant.

Refer to Chapter 8, *Water Quality*, Section 8.3.1.7 for methodological considerations used in the assessment, and Impact WQ-9 in Appendix A for the updates to the DO assessment.

2.2.9 Miscellaneous Revisions and Updates

Several minor, miscellaneous revisions and updates that do not fall into the categories above were also made.

Regarding the Trace Metals assessment, although aluminum was mentioned in the Screening Analysis (Appendix 8C) as being included in the Trace Metals assessment, it was inadvertently omitted. Additional discussion of aluminum (as well as of iron and manganese) was therefore added to *Affected Environment* and additional assessment of aluminum was conducted.

Regarding the assessment of nutrients, a discussion of nutrient objectives was added and language was added to the document to explain why the N:P (nitrogen to phosphorus) ratio was not specifically evaluated, why dissolved vs. total phosphorus was used in the assessment, and how upgrades to the Sacramento Regional Wastewater Treatment Plant would affect phosphorus concentrations in the late long term.

Refer to Chapter 8, *Water Quality*, Section 8.1.3.16 in Appendix A for the discussion of aluminum, iron, and manganese, and Section 8.3.3.1 Impact WQ-27 in Appendix A for the assessment of aluminum.

Refer to Chapter 8, *Water Quality*, Section 8.1.3.10 in Appendix A for the discussion of nutrient objectives, Section 8.3.1.7 in Appendix A for a discussion of the N:P ratio and total vs. dissolved phosphorus, and Section 8.3.1.7 in Appendix A for a discussion of upgrades to the Sacramento Regional Wastewater Treatment Plant effects on phosphorus.

2.3 Air Quality, Health Risk Assessment, Traffic, and Noise Revisions

Chapter 22, *Air Quality and Greenhouse Gases*, evaluates criteria pollutant and greenhouse gas (GHG) emissions from construction and operation of the water conveyance facility (CM1). For all action alternatives other than Alternatives 4A, 2D, and 5A, air quality impacts from implementation of habitat restoration and protection activities (CM2 through CM11) are also evaluated (at the programmatic level). The chapter has been revised since release of the Draft EIR/EIS to address design changes associated with the proposed project, to incorporate the latest engineering assumptions and modeling procedures, and to respond to issues and concerns raised by the public. Where these design and engineering assumptions could result in substantive changes in other impact analyses, such revisions in other impact analyses have also been made since release of the Draft EIR/EIS. These parallel changes occur most notably in Chapter 19, *Transportation*, as well as those portions of Chapter 23, *Noise*, related to noise generated by vehicles and equipment associated with construction of water conveyance facilities. The following sections briefly describe the revisions and their effects on the impact analysis. Please refer to the Chapter 22, *Air Quality and*

Greenhouse Gases, in Appendix A and Section 4, *New Alternatives: Alternatives 4A, 2D, and 5A*, of this RDEIR/SDEIS to review the revised analysis.

2.3.1 Mass Emissions Modeling for Construction of the Water Conveyance Facility

As described in Section 3, *Conveyance Facility Modifications to Alternative 4*, of this RDEIR/SDEIS, several design parameters for the water conveyance facilities under Alternative 4 (described as the modified pipeline/tunnel option) were revised following the release of the Draft EIR/EIS to reflect changes in operation and further reduce environmental impacts. DWR prepared an updated economic analysis (2014 cost estimate) to evaluate these design changes. The 2014 cost estimate provides detailed information on equipment and vehicle activity (e.g., operating hours per day), as well as the start date and number of working days for each construction phase. The mass emissions analysis for Alternative 4, as found in the Draft EIR/EIS, was revised to utilize the 2014 cost estimate assumptions, which reflect the optimized CM1 design. Because the assumptions and methodology developed for the 2014 cost estimate supersede the 2010/2012 cost estimate that was used as the basis of the Draft EIR/EIS air quality analysis, emissions estimates associated with the alternatives were likewise revised using a combination of the 2010/2012 and 2014 cost estimate assumptions[1], where appropriate, as well as activity scaling factors based on consultation with DWR's Engineering Workgroup.

In addition to updating the cost estimate, DWR also revised the Construction Equipment Exhaust Reduction Plan, as found in Section 3B.1.9 of Appendix 3B, *Environmental Commitments*, in Appendix A of this RDEIR/SDEIS, to provide additional implementation flexibility and to improve the level of achieved environmental protection. The revised Construction Equipment Exhaust Reduction Plan, now found in Appendix 3B as revised and reissued as part of this RDEIR/SDEIS, is comprised of several conservative performance standards. Specifically, an average performance standard of model year 2013 engines is identified for offroad equipment (equivalent to a Tier 3 to Tier 4 engine, depending on the equipment type and horsepower). This performance standard must be achieved at each construction site, although construction contractors may utilize a variety of control strategies to meet an emissions output equivalent to or better than a model year 2013 fleet. Potential control strategies include engine electrification, use of Tier 3 or 4 engines, and use of diesel particulate filters. The revised Construction Equipment Exhaust Reduction Plan also includes a performance standard of model year 2010 engines for onroad vehicles, a Tier 3 engine requirement for marine vessels, and a Tier 4 engine requirement for tunneling locomotives. The air quality emissions modeling for Alternative 4 and other alternatives have been revised to reflect implementation of these commitments.

The mass emissions analysis was also revised to incorporate new air quality models released since the Draft EIR/EIS, as well as to respond to public comments. The California Air Resources Board (ARB) released the EMFAC2014 model on December 30, 2014. This model supersedes the EMFAC2011 model, which was used to estimate emissions from onroad vehicles in the Draft EIR/EIS air quality analysis. Accordingly, onroad vehicle emission estimates have been revised using emission factors generated by the EMFAC2014 model. Helicopter emissions were also updated

[1] Features exclusive to the BDCP Alternatives (e.g., intake pumping plants) were not evaluated in the 2014 cost estimate for Alternative 4. Accordingly, the 2010/2012 cost estimate, which represents the best available data for the features, was used to evaluate emissions based on guidance from DWR's Engineering Working Group. Please refer to Appendix 22A, *Air Quality Analysis Methodology*, in Appendix A for additional information.

based on the Federal Aviation Administration's (FAA's) Emissions and Dispersion Modeling System (EDMS). Finally, minor technical revisions have been made in response to public input, including use of GHG emission factors that account for multiple concrete compression strengths. The revisions ensure that the mass emissions analysis and construction impact assessment use the most recent air quality modeling procedures and incorporate applicable public input.

This revised analysis is included for Alternative 4A in Section 4.3.18, for Alternative 2D in Section 4.4.18, for Alternative 5A in Section 4.5.18, and for the remainder of the alternatives in Chapter 22, *Air Quality and Greenhouse Gases* in Appendix A of this RDEIR/SDEIS. The updated modeling resulted in slightly higher mass emission estimates than those presented in the Draft EIR/EIS. However, similar to the Draft EIR/EIS, the project proponents would pursue offsets to reduce emissions below air district thresholds or to net zero. Thus, this impact would be less-than-significant.

2.3.2 Health Risk Assessment for Construction of the Water Conveyance Facility

The health risk assessment (HRA) prepared for the Draft EIR/EIS characterized cancer risks and non-cancer hazards from inhaled diesel particulate matter based on the mass emissions analysis conducted for construction of the water conveyance facilities. Because the mass emissions analysis has been revised based on changes to the project design and underlying engineering assumptions, the HRA was likewise revised to incorporate the updated modeling results. The revised HRA also reflects implementation of the modified Construction Equipment Exhaust Reduction Plan (see revised Appendix 3B), as well as changes to the onroad vehicle (EMFAC2014) and helicopter (EDMS) emission factors. These revisions ensure that the HRA utilizes the most recent engineering data and air quality modeling procedures. The cancer risk analysis was also updated to incorporate recent guidance from the Office of Environmental Health Hazard, which includes age-specific factors to account for increased sensitivity to carcinogens during early-in-life exposure.

This revised analysis is included for Alternative 4A in Section 4.3.18, for Alternative 2D in Section 4.4.18, for Alternative 5A in Section 4.5.18, and for the remainder of the alternatives in Chapter 22, *Air Quality and Greenhouse Gases* in Appendix A of this RDEIR/SDEIS. The updates identify separate health risks associated with exposure to localized particulate matter (PM) and diesel particulate matter (DPM). Significant impacts from receptor exposure to localized PM were found for all alternatives, but would be reduced to less than significant through dust suppressants, receptor relocation, or onsite paving. Receptor exposure to DPM would result in significant impacts for all alternatives except for 4, 4A, and 9. A stepped mitigation approach would ensure that this impact would be less-than-significant.

2.3.3 Mass Emissions Modeling for Operations and Maintenance of the Water Conveyance Facility

As improvements were made to the construction design, DWR similarly continued, following release of the Draft EIR/EIS, to refine operations and maintenance (O&M) protocols for the water conveyance facilities. DWR developed updated equipment and employee O&M assumptions to reflect the latest understanding of project operations. These new assumptions have been incorporated into the mass emissions modeling and operational air quality impact assessment. The analysis has also been revised to utilize onroad emission factors generated by the EMFAC2014

model. The combined revisions ensure that the analysis utilizes the most recent engineering data and air quality modeling procedures.

This revised analysis is included for Alternative 4A in Section 4.3.18, for Alternative 2D in Section 4.4.18, for Alternative 5A in Section 4.5.18, and for the remainder of the alternatives in Chapter 22, *Air Quality and Greenhouse Gases* in Appendix A of this RDEIR/SDEIS. The updated modeling resulted in slightly higher mass emission estimates than those presented in the DEIR/EIS, but all impacts would remain less than significant.

2.3.4 Air District Thresholds and Localized Health Analysis

The Lead Agencies have also added to Chapter 22, *Air Quality and Greenhouse Gases*, further discussion identifying and disclosing the purpose of local air district thresholds with respect to evaluating both regional and local air quality impacts. The added text highlights the fact that, because the regional criteria pollutant thresholds are derived from air quality plans developed to meet and attain the state and federal health-based ambient air quality standards on a regional basis, these thresholds are not indicators of potential localized human health impacts. This additional context better explains how the Plan Area air districts' criteria pollutant thresholds should be applied; and it defines their purpose in evaluating air quality impacts. In general, the thresholds are only used to assess the project's effect on *regional* attainment of the ambient air quality standards. The new language in Chapter 22 explains why localized health impacts cannot be derived from analyses of regional air quality impacts, and why localized exceedences of regional criteria pollutant thresholds recommended by Plan Area air districts do not necessarily translate into adverse health effects.

With these general principles in mind, the chapter has also been revised to explain better how both regional and localized changes in pollutant emissions associated with a project could impact human health. The revised analysis evaluates health effects from pollutants with the greatest potential to result in a significant, material impact on human health. Because health effects related to regional pollutants, such as ozone precursors (ROG and NO_X), are the products of emissions generated by numerous sources throughout a region, minor increases in regional air pollution from project-generated ROG and NO_X would have nominal or negligible impacts on human health. Consequently, potential health effects related to increases in ozone precursors are discussed with respect to cumulative air quality impacts. Project-level analysis of localized pollutants (particulate matter, carbon monoxide, and the pathogenic fungus *Coccidioides immitis*, which can cause valley fever), which can directly affect the health of certain sensitive receptors, has been added to the chapter. The additional analysis addresses concerns regarding the relationship between localized pollutant concentrations and human health by documenting the potential health outcomes induced by project-generated emissions.

This analysis is included for Alternative 4A in Section 4.3.18, for Alternative 2D in Section 4.4.18, for Alternative 5A in Section 4.5.18, and for the remainder of the alternatives in Chapter 22, *Air Quality and Greenhouse Gases* in Appendix A of this RDEIR/SDEIS (refer to Impacts AQ-9 through AQ-18 and AQ-28 through AQ-31).

2.3.5 Odor Analysis

The Draft EIR/EIS air quality analysis evaluated potential odor impacts from equipment and vehicles that would be required for construction and O&M of the water conveyance facilities. The

impact analysis has been expanded to assess potential odors from excavated organic matter during removal of reusable tunnel material (RTM) and sediment. If present in the muck and sediment, anaerobic decay of organic material can generate gases, specifically hydrogen sulfide. Hydrogen sulfide is commonly described as having a foul or "rotten egg" smell. Odor analysis for implementation of CM2 through CM11 has also been added to Chapter 22, *Air Quality and Greenhouse Gases*. The additional discussion provides a more thorough analysis of potential odor impacts associated with the project.

This revised analysis is included for Alternative 4A in Section 4.3.18, for Alternative 2D in Section 4.4.18, for Alternative 5A in Section 4.5.18, and for the remainder of the alternatives in Chapter 22, *Air Quality and Greenhouse Gases* in Appendix A of this RDEIR/SDEIS (refer to Impacts AQ-19 and AQ-26). Odor impacts for all alternatives would be less than significant, consistent with what was presented in the DEIR/EIS.

2.3.6 General Conformity Determination

The project study area is in federally classified nonattainment and/or maintenance areas for ozone, carbon monoxide, and particulate matter. Consequently, to fulfill general conformity requirements, a general conformity determination was prepared for the applicant-preferred alternative (APA), Alternative 4A. Since construction and operation of the project under Alternative 4A would be identical to Alternative 4, the general conformity determination applies to those activities pertaining to both Alternative 4 and Alternative 4A (henceforth referred to as Alternative 4/4A).

The determination concluded that, with implementation of Mitigation Measures AQ-1 through AQ-4, which would develop and implement emissions offset programs, Alternative 4/4A would not conflict with or obstruct implementation of the applicable air quality plans. The Lead Agencies undertook an extensive consultation process with SJVAPCD and BAAQMD to confirm that sufficient emissions reduction credits were available to offset project-generated emissions to net zero. Copies of the air district consultation efforts have been provided in Appendix 22E, *General Conformity Determination*. The appendix also presents the complete general conformity determination for Alternative 4/4A. Consultation with SMAQMD and YSAQMD is still ongoing.

2.3.7 Transportation and Noise Analysis for Construction of the Water Conveyance Facilities

As described in Section 2.3.1, *Mass Emissions Modeling for Construction of the Water Conveyance Facility*, an updated analysis was prepared to evaluate design changes, associated changes based on detailed information of revised equipment and vehicle activity (e.g., operating hours per day), and the start date and number of working days for each construction phase. The transportation and traffic-based noise analyses for Alternative 4 were revised to utilize these revised assumptions, which reflect the optimized design of the water conveyance facilities. Because the assumptions and methodology developed as part of this effort supersede those used as the basis for the Draft EIR/EIS transportation and traffic-based noise analyses, vehicle trip estimates associated with construction of the other alternatives, along with their associated impact discussions, were likewise revised where appropriate.

This revised construction traffic assessment is included for Alternative 4A in Section 4.3.15, for Alternative 2D in Section 4.4.15, for Alternative 5A in Section 4.5.15, and for the remainder of the alternatives in Chapter 19, *Transportation* in Appendix A of this RDEIR/SDEIS (refer to Impacts

TRANS-1 and TRANS-2). Detailed information on the updated traffic modeling results can be found in Appendix 19A, *Air Quality Analysis Methods*, Section 22A.1 in Appendix A. This revised construction noise assessment is included for Alternative 4A in Section 4.3.19, for Alternative 2D in Section 4.4.19, for Alternative 5A in Section 4.5.19, and for the remainder of the alternatives in Chapter 23, *Noise* in Appendix A of this RDEIR/SDEIS (refer to Impact NOI-1). Traffic volumes on certain segments and construction noise levels at some receptor locations increased, relative to the DEIR/EIS. Traffic mitigation to enhance capacity of congested roadway segments and improve the physical condition of affected roadway segments would be pursued, in addition to limits on construction hours and activity. Noise-reducing measures would also be implemented to reduce construction-related noise and vibration levels. However, impacts would remain significant and unavoidable, consistent with what was presented in the DEIR/EIS.

2.4 Revised Project Descriptions and Enhanced Level of Detail

The RDEIR/SDEIS includes a number of revisions to the project description and an enhanced level of detail for Alternative 4. These include more explanation regarding the analysis of water conveyance facilities, updates to CM2–CM21, clarification on the role of the Bureau of Reclamation, and the use of CM3–CM11 to offset impacts related to CM1. As explained above, the RDEIR/SDEIS also includes new sub-alternatives 4A, 2D, and 5A. The project descriptions for these sub-alternatives are included in Section 4, *New Alternatives: Alternatives 4A, 2D, and 5A*, of this RDEIR/SDEIS.

2.4.1 Analysis of Water Conveyance Facility Impacts

Each component feature of the water conveyance facilities is analyzed at a resource-specific level, based on complete water conveyance facility project footprints developed by DWR's Division of Engineering. Analyses of Alternatives 4, 4A, 2D, and 5A in the RDEIR/SDEIS reflect GIS data from DWR that incorporate recent revisions to the alignment of water conveyance features and associated lands required for construction. The features in this GIS dataset, which represents each conveyance facility component (e.g., intakes, intermediate forebay, tunnels, spoils areas), were overlaid onto resource-specific GIS data layers to identify physical effects of conveyance facility construction. This GIS-based approach facilitated both a component-specific, or project-level, analysis of the individual features of the conveyance facilities, as well as a program-level analysis of construction of the conveyance facilities in aggregate. For example, the local effects on parcels of agricultural land associated with construction of a particular intake facility can be assessed through GIS analysis; at the same time, the overall temporary and permanent loss of agricultural lands associated with construction of the conveyance facilities as a whole can be aggregated to convey a comprehensive picture of the effects on the resource.

2.4.2 Updates to Conservation Measures, Environmental Commitments, and Avoidance and Minimization Measures

The RDEIR/SDEIS reflects changes made to the conservation measures and avoidance and minimization measures (AMMs) for Alternative 4 and, where applicable, Alternatives 4A, 2D, and 5A.

These revisions are made to ensure that CM2–CM21 are described consistently where needed in the RDEIR/SDEIS and reflect additional detail that may have been developed since publication of the Draft BDCP. A discussion of the conservation measures and AMMs that have been substantively changed and that would potentially affect the characterization of impacts can be found in Appendix D.

The list of environmental commitments incorporated into all of the action alternatives (i.e., all alternatives except for the No Action/No Project Alternative) was updated extensively to account for refined project engineering. Like the formal mitigation measures prescribed in the Draft EIR/EIS, these environmental commitments, which sometimes take the form of best management practices (BMPs), were intended to avoid or minimize potential adverse effects (a NEPA term) and potential significant impacts (a CEQA term). Both DWR and the federal Lead Agencies were aware that, in many instances, the environmental commitments, as well as related "avoidance and minimization measures," functioned as *de facto* mitigation measures. The Draft EIR/EIS is therefore written with a recognition that, where appropriate and necessary, its text should explain how the environmental commitments and avoidance and minimization measures would function, and whether particular commitments or measures would or would not be effective in reducing various significant or adverse effects to less-than-significant or less-than-adverse levels. Despite these efforts in the Draft EIR/EIS, which was issued for public review in December 2013, several commenters have asserted that the document does not comply with the requirements subsequently announced by the California Court of Appeal in a January 2014 decision known as *Lotus v. Department of Transportation*.[2] In response to these comments, Appendix 3B (in Appendix A) has been significantly modified as part of this RDEIR/SDEIS. In addition to the refinements made to some of the environmental commitments, Appendix 3B as modified now includes, after each specific environmental commitment and avoidance and minimization measure, one or more narrative discussions explaining both how it reduces the severity of environmental effects and whether the level of impact reduction is sufficient to render the effects less than significant.

2.5 Analysis of Geotechnical Investigations

As described in Appendix 3B, *Environmental Commitments*, in Appendix A of this RDEIR/SDEIS, DWR will perform a series of geotechnical investigations along both the selected water conveyance alignment and at locations proposed for facilities or material borrow areas. The work to be performed will constitute a subsurface investigation program to provide information required to support the design and construction of the water conveyance facilities. Geotechnical investigations will be conducted to identify surface and subsurface conditions as necessary to complete design of the water conveyance facilities. The potential environmental effects resulting from conducting geotechnical investigations are described in Chapter 31, *Other CEQA/NEPA Required Sections*, Section 31.5.1.1, of the Draft EIR/EIS.

Following publication of the Draft EIR/EIS, DWR developed a Draft Geotechnical Exploration Plan (Phase 2) for the Alternative 4 conveyance alignment. The geotechnical investigation plan provides additional details regarding the rationale, investigation methods and locations, and criteria for obtaining subsurface soil information and laboratory test data (California Department of Water Resources 2014). Because this new information allows for a more detailed assessment of the

[2] 223 Cal.App.4th 645.

potential environmental effects resulting from geotechnical investigations than that which appeared in Chapter 31 of the Draft EIR/EIS, the activities described in the geotechnical plan have been incorporated into the revised impact analysis for Alternative 4 in this RDEIR/SDEIS (see Section 3, *Conveyance Facility Modifications to Alternative 4*, for a description of other revisions to facility design and Appendix A for revised Draft EIR/EIS text).

2.5.1 Draft Geotechnical Exploration Plan

The proposed exploration is designed as a two-part program (Phases 2a and 2b) to collect geotechnical data relevant to engineering issues associated with conveyance facility construction (as opposed to learning more about the environmental impacts of those facilities). The two-part program will allow refinement of the second part of the program to respond to findings from the first part. The proposed subsurface exploration will focus not on environmental impact issues, but on geotechnical considerations of the following aspects of water conveyance facility development: engineering considerations, construction-related considerations, permitting and regulatory requirements, and seismic characterization considerations.

The data obtained during the geotechnical exploration will be used to support the development of an appropriate geologic model, to characterize ground conditions, and to mitigate the geologic risks associated with construction of proposed facilities. The investigations will build on information previously gathered in geotechnical data reports (California Department of Water Resources 2010a, 2010b, 2011, 2013) and conceptual engineering reports (California Department of Water Resources 2009a, 2009b, 2010c, 2010d, 2010e, 2010f, 2010g, 2014, 2015) that supported analysis in the Draft EIR/EIS. A discussion of the environmental compliance efforts associated with previous geotechnical activities is provided in Appendix 4A, *Summary of Survey Data Collection Efforts,* in the Draft EIR/EIS.

Representative samples of subsurface materials will be collected from selected locations along the MPTO alignment and at proposed facility sites, and the collected samples will be tested to support design. The distance from Intake 2 (the northern extent of the MPTO) to the Clifton Court Forebay (the southern extent) is approximately 39 miles. The proposed facilities include river intakes, conveyance pipelines, sedimentation basins, pumping plants, transition structures, forebays, construction and vent shafts, access roads, bridges, and tunnels. The proposed subsurface exploration will consist of field tests and laboratory testing of soil samples. The field tests will consist of soil borings, cone penetration testing (CPT), geophysical testing, pressure meter testing, excavation of test pits, installation of piezometers and groundwater extraction wells, dissolved gas sampling, and aquifer tests. The field exploration program will be planned to evaluate soil characteristics and to collect samples for laboratory testing, which will include soil index properties, strength, compressibility, permeability, and specialty testing to support tunnel boring machine (TBM) selection and performance specification.

The proposed Phase 2a and 2b exploration on land will consist of approximately 1,500–1,550 exploration locations including drilling boreholes and performing CPTs as well as conducting approximately 60 shallow test pit excavations (typically 4 feet wide, 12 feet long, and 12 feet deep) in soils to evaluate bearing capacity, physical properties of the sediments, location of the groundwater table, and other typical geologic and geotechnical parameters. CPT consists of pushing a cone connected to a series of rods into the ground at a constant rate, allowing continuous measurements of resistance to penetration both at the cone tip and the sleeve behind the cone tip.

The resulting information correlates to the nature and sequence of subsurface soil strata, groundwater conditions, and physical and mechanical properties of soils.

Temporary pumping wells and piezometers may be installed at intake, forebay, pump shaft, and tunnel shaft sites to investigate soil permeability and to allow sampling of dissolved gases in the groundwater. Small test pits will be excavated to obtain near-surface soil samples for laboratory analysis. Drilling will take place at project sites that are readily accessible by truck or track-mounted drill rigs.

After each site is explored, the boring, CPTs, and/or piezometers will be backfilled with cement-bentonite grout in accordance with California regulations and industry standards (Water Well Standards, DWR 74-81 and 74-90). Test pits will be backfilled with the excavated material on the same day as they are excavated with the stockpiled topsoil placed at the surface and the area restored as closely as possible to its original condition.

Exploration activities may consist of auger and mud-rotary drilling with soil sampling using a standard penetration test (SPT) barrel (split spoon sampler) and Shelby tubes; cone penetrometer testing; temporary well installation; test pits; and electrical resistivity and other geophysical surveys. All exploration methods will require a drill rig and support vehicle for the drillers and vehicles for the geologists and environmental scientists. Best management practices applicable to geotechnical exploration, such as those set forth in *Draft Geotechnical Exploration Plan – Phase 2*; Draft BDCP Appendix 3.C, *Avoidance and Minimization Measures*; Appendix 3B, *Environmental Commitments,* in Appendix A of this RDEIR/SDEIS, as well as those incorporated as mitigation measures throughout the EIR/EIS, will also apply to the implementation of geotechnical explorations, where applicable (e.g., in-water activities may, in some cases, require application of a different set of commitments than activities taking place on land). Direct impacts to buildings, utilities, and known irrigation and drainage ditches will be avoided during geotechnical exploration activities. The various on-land exploration methods may last from a few hours to several days depending on the exploration method and depth.

Approximately 90–100 overwater geotechnical borings and CPTs are proposed to be drilled in the Delta waterways. These include approximately 30 overwater geotechnical borings and CPTs in the Sacramento River to obtain geotechnical data for the proposed intake structures. Approximately 25–35 overwater borings and CPTs are planned at the major water undercrossings along the planned MPTO tunnel alignment. An additional 30–35 overwater geotechnical borings and CPTs are proposed for the barge unloading facilities and Clifton Court Forebay modifications. The depths of borings and CPTs are planned to range between 100 and 200 feet below the mud line (i.e., river bottom).

DWR plans to conduct overwater drilling only during the period from August 1 to October 31 between the hours of sunrise and sunset. Duration of drilling at each location will vary depending on the number and depth of the holes, drill rate, and weather conditions, but activities are not expected to exceed 60 days at any one location. Overwater borings for the intake structures and river crossings for tunnels will be carried out by a drill ship and barge-mounted drill rigs. Best management practices applicable to construction of conveyance facilities, such as those set forth in Draft BDCP Appendix 3.C, *Avoidance and Minimization Measures*, Appendix 3B, *Environmental Commitments*, in Appendix A of this RDEIR/SDEIS, as well as those incorporated as mitigation measures throughout the EIR/EIS, will also apply to the implementation of geotechnical

explorations, where applicable and feasible (e.g., in-water activities may, in some cases, require application of a different set of commitments than activities taking place on land).

As discussed above, the proposed subsurface exploration has been structured into two major phases: 2a and 2b. The elements of Phases 2a and 2b have been defined to support engineering design and construction as described below.

2.5.1.1 Phase 2a Geotechnical Exploration

Phase 2a exploration will focus mainly on collecting data to support preliminary engineering. This includes overwater and land-based soil borings and CPTs. The overwater explorations are planned to collect subsurface information to support the design of intake structures and the major water crossings along the MPTO. Land-based explorations are planned for the intake perimeter berms, State Route 160 (SR 160), sedimentation basins, pumping plants, forebay embankments, tunnel construction and vent shafts, and other appurtenant facilities proposed for the MPTO. Approximately 600 boring and CPT locations are proposed for the Phase 2a exploration.

For the proposed MPTO tunnels, Phase 2a would entail soil borings approximately every 2,000 feet along the tunnel alignment and CPTs approximately every 2,000 feet midway between the borings. Overwater boreholes and CPTs are planned in Potato Slough, San Joaquin River, Connection Slough, and Clifton Court Forebay. All of the land-based boreholes along the tunnel alignments will be converted into piezometers. CPTs are also proposed to be co-located at every third borehole to enable calibration of the CPT data with the in-situ geology encountered in the boreholes.

For tunnel shaft sites and Clifton Court Forebay pumping plant shaft sites (see Section 3, *Conveyance Facility Modifications to Alternative 4*, of this RDEIR/SDEIS for a description of the revised location for pumping plants under the MPTO), six soil borings and four CPTs will be advanced at each planned shaft location. Once drilling is completed at each shaft site, two of the boreholes will be converted into groundwater extraction wells and the other four boreholes will be converted into piezometers.

Boreholes and CPTs are also proposed for the intake and pumping plant sites, as well as the planned location for the realignment of SR 160 adjacent to each intake. Approximately six of the boreholes at each of the north Delta diversions would be converted into piezometers.

2.5.1.2 Phase 2b Geotechnical Exploration

Phase 2b exploration is proposed to collect geotechnical data to support final design, permitting requirements, and planning for procurement and construction-related activities. In addition to soil borings and CPTs, test pits would be created as part of Phase 2b exploration. Additional explorations may also be carried out before construction to affirm the validity of the data collected during the design phase. The Phase 2b subsurface exploration will aim to collect geotechnical data from those project site areas and facility locations that have been verified by preliminary engineering and other associated studies. Approximately 950 boring, CPT, and test pit locations are proposed for the Phase 2b exploration.

For the proposed MPTO tunnels, the Phase 2b exploration will consist of advancing soil borings near the Phase 2a CPT locations such that a borehole will have been located at approximately 1,000-foot intervals along the entire tunnel alignment. CPTs will be advanced midway between the boreholes. This configuration would provide for a land-based exploratory location (borehole or CPT) spacing of

approximately 500 feet along the tunnel alignment, a spacing that generally conforms to typical design efforts for tunnels such as those proposed as part of the MPTO. The exploration proposed for the construction and ventilation shaft sites in Phase 2a would be expanded to include areas for accessing the TBMs for equipment inspection and maintenance ("safe haven intervention sites") in Phase 2b. Overwater boreholes and CPTs are planned in the Sacramento River, Snodgrass Slough, South Fork Mokelumne River, San Joaquin River, Potato Slough, Middle River, Connection Slough, Old River, North Victoria Canal, and Clifton Court Forebay.

2.5.1.3 Schedule for Geotechnical Explorations

The estimated duration to complete the proposed Phase 2a and 2b land-based explorations is about 24 months, assuming six land-based drill rigs operating concurrently for six days per week. The estimated duration to complete the Phase 2a and 2b overwater explorations is about 14 months, assuming two drill rigs operating concurrently for 6 days per week. However, to maintain the project development schedule, it is likely that 10–15 land-based drill rigs would be used simultaneously for 12–18 months to complete the exploration. The exploration duration will vary depending on the availability of site access, drilling contractors and equipment, permitting conditions, and weather. Most of the proposed explorations are planned to be performed during the first 3 years of implementation.

2.5.2 Methods for Environmental Analysis

Based on information provided in the geotechnical plan and coordination with DWR's engineering workgroup, assumptions were developed to incorporate the proposed geotechnical investigations into the analysis of relevant resource topics in this RDEIR/SDEIS. The geotechnical plan is a draft document that is based on conceptual engineering; consequently, the specific exploration locations shown on figures appended to the plan are approximate, and it is anticipated that they may be revised as engineering efforts are advanced and as access to the proposed exploration sites becomes available.

To account for this uncertainty, several steps were taken to develop assumptions for environmental analysis. First, for analyses based on the geographical extent of an impact, it was assumed that those geotechnical exploration sites will be co-located with or located adjacent to another CM1 surface feature were already considered as an affected area for the purposes of the impact analysis. For example, treating a proposed tunnel shaft location as an impact and then adding an additional impact for a geotechnical exploration proposed for the same location would lead to an overestimate of the overall impacts. However, where sites identified for on-land geotechnical explorations were not positioned with a corresponding conveyance feature or work site, several geotechnical exploration zones (GEZs) were created. These GEZs are located above the tunnel alignment, around Clifton Court Forebay, and at one existing bridge location on Bacon Island (see Mapbook Figure M3-4 for the locations of the GEZs). To account for the potential for surface impacts to take place anywhere within these zones but to avoid implying that the entire area will be affected, a proportional approach was developed to (1) estimate the typical area required for a single geotechnical investigation site (including associated access road), (2) calculate the total acreage required based on the number of sites within the GEZs, and (3) divide the total acreage required for the geotechnical investigation sites in the GEZs by the total acreage of the GEZs. This process allowed for the development of a multiplier (approximately 30%) that could be applied to specific acreage impacts in the GEZs. So, as an example for illustrative purposes, if 100 total acres within the

GEZs are identified as "prime farmland," the impact analysis would assume that geotechnical investigations would affect 30 acres. This acreage estimate would then be included as part of the overall effect reported for the MPTO water conveyance facilities.

For proximity-based analysis (such as noise), relevant "buffers" were simply applied from the outside edges of the GEZs to ensure that any effects on sensitive receptors were included in the impact analysis. For analyses associated with air quality modeling, specific assumptions regarding equipment, vehicle use, and schedule information were incorporated into the existing models used for impact analysis. Finally, it was assumed that the overwater sites identified in the geotechnical plan would be representative of the sites ultimately chosen because it is anticipated that site selection for these investigations is more constrained than sites for on-land activities. Sites for overwater exploration would be chosen at the locations for the three proposed intake structures in the Sacramento River, Clifton Court Forebay, and at major water crossings along the tunnel alignment or areas proposed for barge unloading facilities, including Snodgrass Slough, Mokelumne River, Potato Slough, San Joaquin River, Connection Slough, Middle River, Santa Fe Cut, Woodward Canal, Old River, and Italian Slough.

2.5.3 Applicability to Other Alternatives

If the Lead Agencies ultimately select an alternative that proposes an alignment different from the modified pipeline/tunnel alignment, it is anticipated that a similar plan for geotechnical exploration would be designed and implemented, as described in Appendix 3B, *Environmental Commitments*, in Appendix A of this RDEIR/SDEIS. A discussion of the potential environmental effects resulting from implementation of these activities appears in Chapter 31, *Other CEQA/NEPA Required Sections,* Section 31.5.1.1 in the Draft EIR/EIS. Because additional detail pertaining to the location and extent of these efforts under the modified pipeline/tunnel alignment has been developed since the release of the Public Draft EIR/EIS, the potential effects of these activities have been incorporated into relevant portions of the impact analysis pertaining to construction of the water conveyance facilities.

2.6 References

2.1 Fish and Aquatic Habitat Analyses

None.

2.2 Water Quality Revisions

None.

2.3 Air Quality, Health Risk Assessment, Traffic, and Noise Revisions

None.

2.4 Revised Project Descriptions and Enhanced Level of Detail

None.

2.5 Analysis of Geotechnical Investigations

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Section 3
Conveyance Facility Modifications to Alternative 4

3.1 Background and Description of Facility Modifications

In December 2014, the administration of Governor Edmund G. Brown, Jr., and its federal partners announced several substantial changes to the proposed water conveyance portion of the proposed Bay Delta Conservation Plan (BDCP), including elimination of the need to build three pumping plants, a component of the intake facilities, along the Sacramento River near Hood.

In addition to the changes announced in December 2014, the proposed water conveyance facilities have also been refined based on further engineering analysis and in consideration of feedback received during the 2014 public comment period. Where applicable, the changes have been incorporated into the impact analysis for Alternative 4 in the RDEIR/SDEIS. The changes would achieve the benefits listed below.

- Eliminate three pumping plants associated with the new intake facilities, and the visual effects associated with these facilities, on the east bank of the Sacramento River between Clarksburg and Courtland.
- Minimize construction activities on Staten Island, which provides important sandhill crane habitat, by removing tunnel launch facilities, large reusable tunnel material (RTM) storage areas, a barge landing site, and high-voltage power lines.
- Minimize impacts to private landowners by relocating project features to property already owned by the California Department of Water Resources (DWR) and reducing the acreage of lands needing to be acquired from private and Non-Governmental Organization (NGO) landowners.
- Eliminate the need for additional permanent power lines to the intake locations in the north Delta, including near Stone Lakes National Wildlife Refuge.
- Eliminate impacts on Italian Slough (near Clifton Court Forebay) by removing an underground siphon.
- Reduce electric power requirements for construction and potentially operation of the facilities.
- Allow water to flow from the Sacramento River and through screened intakes, initial tunnels, an intermediate forebay, main tunnels, and into Clifton Court Forebay entirely by gravity at certain river stages (previously, only flows between the intermediate forebay and Clifton Court Forebay would be conveyed by gravity).
- Reduce tunnel operation and maintenance costs.

These changes would eliminate the need to build three separate two-story pumping plants along a 5-mile stretch of the Sacramento River between Clarksburg and Courtland. The original plans to build three intakes screened for fish protection along that stretch of river would not change, but after extensive engineering analysis, DWR has determined that it is not necessary to build pumping plants adjacent to each intake to move the water from the river and into tunnels. Instead, water

could be moved from the river into tunnels by two new pumping plants constructed 40 miles away, on DWR property at the southern end of the tunnels near Clifton Court Forebay.

The RDEIR/SDEIS does not change the impact disturbance assumptions associated with the roughly 87-acre footprint of each intake, but the three 46,000-square-foot buildings would not be needed to house pumping plants; nor would permanent transmission lines, substations, and surge towers be needed at the intake sites. Facilities at the intakes would include fish screens in the river, sedimentation basins, drying lagoons, access roads, and control gate structures. Additional refinements include the adoption of an intake design that features an open sedimentation basin behind the fish screens. This design would reduce the amount of construction activity required at each intake site and would eliminate the temporary relocation of State Route (SR) 160 by realigning the highway over widened levee sections prior to commencing construction of the intake structures.

The modifications would help preserve the views from SR 160 between Hood and Walnut Grove, a state-designated scenic highway, as described in Chapter 17, *Aesthetics and Visual Resources,* Section 17.3.3.9 in Appendix A.

Throughout the development of the BDCP and the associated EIR/EIS, DWR has sought to minimize potential disruption and dislocation of Delta residents. These refinements to the design of the proposed water conveyance facilities also reflect continued efforts on the part of the Lead Agencies to reduce environmental impacts. See Section 3.2 below for a more detailed description of the water conveyance facility components for Alternative 4, accounting for these modifications. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3.2-1, below. Each water component is described in further detail in Chapter 3, *Description of Alternatives,* Section 3.6.1, in Appendix A.

3.2 Revised Description of Water Conveyance Facility Components under Alternative 4

Under Alternative 4, water would be conveyed from the north Delta to the south Delta through tunnels. Water would be diverted from the Sacramento River through three fish-screened intakes on the east bank of the Sacramento River between Clarksburg and Courtland. Water would travel from the intakes to a sedimentation basin before reaching the tunnels. From the intakes water would flow into an initial single-bore tunnel, which would lead to an intermediate forebay on Glannvale Tract. From the southern end of this forebay, water would pass through an outlet structure into a dual-bore tunnel where it would flow by gravity to the south Delta. Water would then reach pumping plants to the northeast of the Clifton Court Forebay, where water would be pumped into the north cell of the expanded Clifton Court Forebay. The forebay would be dredged and redesigned to provide an area isolating water flowing from the new north Delta facilities. When operating, the expanded Clifton Court Forebay would be designed to provide water to both the Banks and Jones pumping plants.

Table 3.2-1. Summary of Physical Characteristics under Alternative 4

Feature Description/Surface Acreage[a]	Approximate Characteristics
Overall project/2,000 acres	
Conveyance capacity (cfs)	9,000
Overall length (miles)	45
Intake facilities/approximately 90 acres average per site	
Number of on-bank fish-screened intakes	3
Maximum diversion capacity at each intake (cfs)	3,000
Tunnels/170 acres (permanent subsurface easement = 1,700 acres)	
Tunnel 1a connecting Intakes 2 and 3 to the intermediate forebay	
Tunnel length (mi)	8.73
Number of tunnel bores; number of shafts (total)	1; 4
Tunnel finished inside diameter (ft)	28 (between Intakes 2 and 3); 40 (between Intake 3 and the intermediate forebay)
Tunnel 1b connecting Intake 5 to the intermediate forebay	
Tunnel length (mi)	4.77
Number of tunnel bores; number of shafts (total)	1; 3
Tunnel finished inside diameter (ft)	28
Tunnel 2 connecting intermediate forebay to Clifton Court Forebay	
Tunnel length for each bore (mi)	30.1
Number of tunnel bores; number of shaft sites (total per bore)	2; 9
Tunnel finished inside diameter (ft)	40
Intermediate forebay/243 acres	
Water surface area, at elevation 0 ft (acres)	37
Active storage volume (af)	750
Emergency spillway inundation area (acres)	131
Clifton Court Pumping Plant	
Total Number of Pumps (both pumping plants)	12
8 large pumps, capacity per pump (cfs)	1,125
4 small pumps, capacity per pump (cfs)	563
Total dynamic head (ft)	37
Expanded Clifton Court Forebay/2,600 acres (total water surface area at maximum operation level)	
Forebay dredging area (acres)	2,010
Expanded water surface area (acres)	590
Active storage volume (af)	4,300 to 10,200 (north cell) 14,000 (south cell)
Power requirements	
Estimated pumping electric load (MW)	36

af = acre-feet.
cfs = cubic feet per second.
ft = feet.
MW = megawatt.

[a] Acreage estimates represent the permanent surface footprints of selected facilities. Characteristics of other areas including temporary work areas and those designated for borrow, spoils, and reusable tunnel material are reported in Appendix 3C (in Appendix A). Overall project acreage includes some facilities not listed, such as permanent access roads.

A map and a schematic diagram depicting the conveyance facilities associated with Alternative 4 are provided in Figures 3-9 and 3-10 in Appendix A of this REIR/SDEIS. Figure 3-9 shows the major construction features associated with this proposed water conveyance facility alignment; a detailed depiction is provided in Figure M3-4 in the Mapbook Volume. Figures 3-19a and 3-20a in Appendix A of this REIR/SDEIS depict the modified intake design. New siphon and canal connections would be constructed between the north cell of the expanded Clifton Court Forebay and the Banks and Jones pumping plants, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta. Alternative 4 would entail the continued use of the SWP/CVP south Delta export facilities.

Alternative 4 would include the following new water conveyance facilities components.

- Three north Delta intakes with fish screens along the east bank of the Sacramento River (Intakes 2, 3, and 5) with box conduits, sedimentation basins, gates, a drop structure, and solids drying lagoons. (Chapter 3, *Description of Alternatives*, Section 3.6.1.1, in Appendix A of this RDEIR/SDEIS)
- Associated facilities include an access road, fencing and security gates, an electrical building with transformers, switching equipment, a backup generator and fuel tank, storage buildings, communication devices, and an outlet tower.
- One single-bore tunnel connecting Intake 2 to Intake 3, and the intermediate forebay (Tunnel 1a), with a launch, retrieval, and vent shaft. The segment of this tunnel between Intakes 2 and 3 would have an inside diameter of 28 feet and the segment between Intake 3 and the intermediate forebay would have an inside diameter of 40 feet. (Chapter 3, *Description of Alternatives*, Section 3.6.1.2, in Appendix A of this RDEIR/SDEIS)
- One 28-foot-inside-diameter single-bore tunnel between Intake 5 and the intermediate forebay (Tunnel 1b), with a launch, retrieval, and vent shaft. (Chapter 3, *Description of Alternatives*, Section 3.6.1.2, in Appendix A of this RDEIR/SDEIS)
- Gates and flowmeters between intakes and sedimentation basins, junction structures, or tunnel shafts.
- Transition structures, such as stop logs and vents, between tunnel shafts and the intermediate forebay.
- Inlet structures with roller gates, trashracks, gate hoist gantry, and stop logs.
- An intermediate forebay, a pass-through facility. (Chapter 3, *Description of Alternatives*, Section 3.6.1.4, in Appendix A of this RDEIR/SDEIS)
- An outlet structure to convey water from the intermediate forebay into each main tunnel bore (Tunnel 2) via a vertical shaft. (Chapter 3, *Description of Alternatives*, Section 3.6.1.4, in Appendix A of this RDEIR/SDEIS)
- Two 40-foot-inside-diameter tunnels (Tunnel 2) between the intermediate forebay and two 4,500 cfs pumping plants leading to the expanded Clifton Court Forebay, with large-diameter TBM launch/retrieval shafts, safe haven work areas, and vent shafts at approximately 4-mile intervals. (Chapter 3, *Description of Alternatives*, Section 3.6.1.2, in Appendix A of this RDEIR/SDEIS)

- An expanded Clifton Court Forebay with new embankments and an embankment dividing the forebay into a north cell and a south cell. (Chapter 3, *Description of Alternatives*, Section 3.6.1.4, in Appendix A of this RDEIR/SDEIS)
- Connections and control structures to the Banks and Jones pumping plants. (Chapter 3, *Description of Alternatives*, Section 3.6.1.5, in Appendix A of this RDEIR/SDEIS)
    - A culvert siphon between the north cell of Clifton Court Forebay and a new canal segment.
    - A canal and set of gates between the siphon leading from the north cell and the approach canal to the Jones Pumping Plant.
    - A culvert siphon, two segments of canal, and a set of gates between the siphon leading from the north cell of Clifton Court Forebay and the approach canal to Banks Pumping Plant, downstream of Skinner Fish Facility.
    - A set of gates in the existing approach canal to the Banks Pumping Plant downstream of the connection to the north cell of Clifton Court Forebay.
    - A set of gates in the existing approach canal to the Jones Pumping Plant downstream of the connection to Old River.
- Transmission lines running from the existing electrical grid to project substations. Under Alternative 4, the method of delivering power to construct and operate the water conveyance facilities is assumed to be a "split" system that would connect to the existing grid in two different locations—one in the northern section of the alignment, and one in the southern section of the alignment. It is anticipated that only the southern interconnection would remain in place during conveyance facility operations. (Chapter 3, *Description of Alternatives*, Section 3.6.1.6, in Appendix A of this RDEIR/SDEIS)
- Borrow areas and areas identified for the storage and/or disposal of spoil, RTM, and dredged material. (See Mapbook Figure 3-4 for updated locations)

Facilities under Alternative 4 would be operated to provide diversions up to a total of 9,000 cfs from the new north Delta intakes. The total diversion capacity of the south Delta export facilities would remain constant at 15,000 cfs. The north Delta facilities would provide flexibility from where water is being diverted from (north vs. south Delta). Operations of the existing SWP/CVP south Delta export facilities would continue as described for the No Action Alternative.

As described in Section 2.5, geotechnical exploration would be required to obtain data to support the development of an appropriate geologic model, characterize ground conditions, and reduce the geologic risks associated with the construction of proposed facilities. Exploration methods would include soil borings and conventional piezocones and seismic cones, as well as sampling for gas within soils and groundwater at selected locations.

3.3 Impacts of Alternative 4 Modifications

In many cases, physical modifications made to the water conveyance facilities under Alternative 4 would result in reduced effects of construction from that described for Alternative 4 in the Draft EIR/EIS. These design changes were reviewed and assessed for each applicable impact discussion in the document. The sections that follow summarize the individual topics that were considered in

light of these changes and provide references to Appendix A, *Revisions to the Draft EIR/EIS*, which highlights revisions made to the impact analysis presented in "redline-strikeout" format.

3.3.1 Draft EIR/EIS Chapters Not Revised

Physical modifications made to Alternative 4 water conveyance facilities did not require revisions to the following chapters in the EIR/EIS: Chapter 1, *Introduction*; Chapter 2, *Project Objectives and Purpose and Need*; Chapter 4, *Approach to Environmental Analyses*; Chapter 5, *Water Supply*; Chapter 29, *Climate Change*; Chapter 30, *Growth Inducement and Other Indirect Effects*; Chapter 31, *Other CEQA/NEPA Required Sections*; and Chapter 32, *Public Involvement*, because the facility changes would not substantively change any of the information or analyses presented in these sections of the Draft EIR/EIS. In some cases, revisions to these chapters have been made in response to other considerations; these revisions are described, where appropriate, throughout the RDEIR/SDEIS and appear in Appendix A.

3.3.2 Description of Alternatives

Chapter 3, *Description of Alternatives*, of the Draft EIR/EIS was revised to reflect the conveyance facility modifications to Alternative 4 described above. Descriptions of individual features unique to Alternative 4 have been added and, in cases where existing text no longer applies to Alternative 4, such text was revised to specify those alternatives to which it refers. Tables with detailed parameters specific to Alternative 4 have been updated where required to reflect changes in the design of the alternative (as well as changes in engineering assumptions described in Section 2.3, *Air Quality, Health Risk Assessment, Traffic and Noise Revisions*).

Refer to Chapter 3, *Description of Alternatives,* Sections 3.2.3, 3.4.1, 3.5.9, and 3.6.1 in Appendix A for additional detail regarding the revised description of Alternative 4. Detailed information on the updated alternative and associated assumptions can be found in Appendix 3C, *Construction Assumptions for Water Conveyance Facilities,* Section 3C.4 in Appendix A.

3.3.3 Surface Water

Chapter 6, *Surface Water*, of the Draft EIR/EIS was revised to update the surface water analyses to account for modifications in the design of the intake facilities under Alternative 4. Specifically, these design changes were considered in the context of changes in the levee configuration and the associated discussion of flood protection. The revised design was also considered for its potential to create impacts related to drainage patterns, surface runoff volumes, and risks associated with flooding.

Refer to Chapter 6, *Surface Water*, Section 6.3.3.9, Impacts SW-4, SW-7, and SW-9 in Appendix A for the revised analysis of Alternative 4.

3.3.4 Groundwater

Chapter 7, *Groundwater*, of the Draft EIR/EIS was revised in consideration of the potential for effects of dewatering activities to occur in different locations or at different magnitudes during construction of water conveyance facilities under Alternative 4 as revised. In particular, modeling assumptions were reviewed and groundwater modeling was replicated to account for the revised design and footprint of the facilities.

Refer to Chapter 7, *Groundwater*, Section 7.3.3.9, Impacts GW-1, GW-3, and GW-4 in Appendix A for the revised analysis of Alternative 4.

3.3.5 Water Quality

Chapter 8, *Water Quality*, of the Draft EIR/EIS was revised to describe the potential for water quality effects associated with construction of water conveyance facilities—such as those related to discharges from work sites or changes to stormwater drainage and runoff patterns—to occur in different locations as a result of the revised facility footprints.

Refer to Chapter 8, *Water Quality*, Section 8.3.3.9, Impact WQ-31 in Appendix A for the revised analysis of Alternative 4.

3.3.6 Geology and Seismicity

Chapter 9, *Geology and Seismicity*, of the Draft EIR/EIS was modified to describe the geologic or seismic risks associated with the revised water conveyance facility footprints. Specifically, text was revised to describe the potential for slope failure in relation to the optimized intake design, which would include an open sedimentation basin surrounded on the landside by a raised pad and new section of levee.

Refer to Chapter 9, *Geology and Seismicity*, Section 9.3.3.9, Impacts GEO-1, GEO-2, GEO-4, and GEO-5 in Appendix A for the revised analysis of Alternative 4.

3.3.7 Soils

Chapter 10, *Soils*, of the Draft EIR/EIS was reviewed and revised to assess potential effects related to erosion, topsoil loss, and soil-related risks associated with the modified design and location of water conveyance facilities.

Refer to Chapter 10, *Soils*, Section 10.3.3.9, Impacts SOILS-1, SOILS-2, SOILS-3, and SOILS-4 in Appendix A for the revised analysis of Alternative 4.

3.3.8 Fish and Aquatic Resources

Chapter 11, *Fish and Aquatic Resources*, of the Draft EIR/EIS was revised to assess potential construction-related impacts on fish that could result from new or changed in-water construction sites (e.g., barge unloading facilities) and updated assumptions for pile-driving activities in or adjacent to water bodies.

Refer to Section 4.3.7, *Fish and Aquatic Resources*, Impacts AQUA-1, AQUA-19, AQUA-37, AQUA-55, AQUA-73, AQUA-91, AQUA-109, AQUA-127, AQUA-145, AQUA-163, AQUA-181, and AQUA-199 for the analysis of Alternative 4A. These construction-related impacts would be identical for Alternative 4 because the proposed physical water conveyance facilities are the same for both alternatives.

3.3.9 Terrestrial Biological Resources

Chapter 12, *Terrestrial Biological Resources*, of the Draft EIR/EIS was revised to account for changes in the magnitude of direct impacts on natural communities and species habitat associated with the footprint of the revised water conveyance facilities, including the revised power line alignment and

assumptions. Additionally, indirect impacts associated with the construction of water conveyance facilities were reviewed and revised where applicable.

Refer to Chapter 12, *Terrestrial Biological Resources,* Section 12.3.3.9 in Appendix A for the revised analysis of Alternative 4.

3.3.10 Land Use

Chapter 13, *Land Use*, of the Draft EIR/EIS was modified to describe the potential for the revised design of water conveyance facilities to result in incompatibilities with applicable land use plans and policies in the study area. Similarly, the potential for the construction and/or long-term placement of water conveyance facilities to result in direct effects on current land uses was also assessed, along with the potential for such facilities to create a physical division within an existing community.

Refer to Chapter 13, *Land Use*, Section 13.3.3.9, Impacts LU-1, LU-2, and LU-3 in Appendix A for the revised analysis of Alternative 4.

3.3.11 Agricultural Resources

Chapter 14, *Agricultural Resources*, of the Draft EIR/EIS was revised to account for changes in the magnitude of direct temporary and permanent effects on Important Farmland and land subject to Williamson Act contracts associated with the footprint of the revised water conveyance facilities. Additionally, indirect impacts associated with the construction of water conveyance facilities, such as effects related to changes in groundwater elevation or disruptions to agricultural infrastructure, were reviewed and revised where applicable.

Refer to Chapter 14, *Agricultural Resources*, Section 14.3.3.9, Impacts AG-1 and AG-2 in Appendix A for the revised analysis of Alternative 4.

3.3.12 Recreation

Chapter 15, *Recreation*, of the Draft EIR/EIS was revised to assess the potential for the modified construction footprint, along with a refined set of construction equipment and schedule assumptions developed for Alternative 4, for the water conveyance facilities to create temporary or permanent effects on existing well-established recreation facilities or result in the long-term reduction of recreation opportunities and experiences in the study area for water-based and upland recreational activities.

Refer to Chapter 15, *Recreation*, Section 15.3.3.9, Impacts REC-1, REC-2, REC-3, and REC-4 in Appendix A for the revised analysis of Alternative 4.

3.3.13 Socioeconomics

Chapter 16, *Socioeconomics,* of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities, along with a refined set of construction cost and schedule assumptions developed for Alternative 4. This information was used to update the assessment of effects on the regional economy and employment, agricultural and recreational economic effects, changes in population and housing, changes in local government fiscal conditions, and changes in community character associated with construction (and ongoing operation and maintenance) of water conveyance facilities under Alternative 4.

Refer to Chapter 16, *Socioeconomics*, Section 16.3.3.9, Impacts ECON-1, ECON-2, ECON-3, ECON-4, ECON-5, ECON-6, ECON-7, ECON-9, and ECON-10 in Appendix A for the revised analysis of Alternative 4. Additionally, one table from Draft EIR/EIS Appendix 16A has been incorporated into Appendix A.

3.3.14 Aesthetics and Visual Resources

Chapter 17, *Aesthetics and Visual Resources*, of the Draft EIR/EIS was modified to assess the potential of the revised design of water conveyance facilities (and associated architectural guidelines incorporated in a revised conceptual engineering report) to result in a substantial alteration of the existing visual quality or character within the study area or create effects on a scenic vista or along a state scenic highway. This chapter was also revised to consider the potential for construction activities to create new sources of light or glare that would adversely affect views in the area. In particular, the updated intake design was assessed through the preparation of several revised visual simulations.

Refer to Chapter 17, *Aesthetics and Visual Resources*, Section 17.3.3.9, Impacts AES-1, AES-2, AES-3, AES-4, and AES-5 in Appendix A for the revised analysis of Alternative 4. Several passages from supporting appendices to Draft EIR/EIS Chapter 17 have also been incorporated into Appendix A.

3.3.15 Cultural Resources

Chapter 18, *Cultural Resources*, and Appendix 18B, of the Draft EIR/EIS were revised to account for changes in the number of built environment resources potentially directly or indirectly affected by construction of the water conveyance facilities.

Refer to Chapter 18, *Cultural Resources*, Section 18.3.3.9, Impact CUL-5 in Appendix A for the revised analysis of Alternative 4.

3.3.16 Transportation

Chapter 19, *Transportation*, of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities, along with a refined set of construction equipment and schedule assumptions developed for Alternative 4. This information was used to update the assessment of effects on roadway level of service and pavement conditions associated with construction vehicle trips under Alternative 4, including the transport of equipment, materials, and workers to and from project construction sites. Analyses associated with the potential for increased safety hazards and disruption of other modes of transportation including marine, rail, transit, and bicycle traffic were also revised based on the updated construction information.

Refer to Chapter 19, *Transportation*, Section 19.3.3.9, Impacts TRANS-1, TRANS-2, TRANS-3, TRANS-4, TRANS-5, TRANS-6, and TRANS-7 in Appendix A for the revised analysis of Alternative 4. Additionally, portions of Draft EIR/EIS Appendix 19A have also been incorporated into Appendix A.

3.3.17 Public Services and Utilities

Chapter 20, *Public Services and Utilities*, of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities for Alternative 4, including the revised power line alignment and assumptions. This information was used to update the impacts

related to demand and effects on public services such as law enforcement, fire protection, and emergency response services; public service facilities; public schools; services and facilities related to water and wastewater treatment, solid waste and landfills, and regional or local utilities, as a result of constructing the proposed water conveyance facilities.

Refer to Chapter 20, *Public Services and Utilities*, Section 20.3.3.9, Impacts UT-1, UT-2, UT-3, UT-4, UT-5, and UT-6 in Appendix A for the revised analysis of Alternative 4.

3.3.18 Energy

Chapter 21, *Energy*, of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities for Alternative 4. This information was used to update the assessment of any potentially wasteful or inefficient energy use for temporary construction activities related to the proposed water conveyance facilities.

Refer to Chapter 21, *Energy*, Section 21.3.3.9, Impact ENG-1 in Appendix A for the revised analysis of Alternative 4.

3.3.19 Air Quality and Greenhouse Gases

Chapter 22, *Air Quality and Greenhouse Gases*, of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities for Alternative 4, along with a refined set of construction equipment and schedule assumptions developed for Alternative 4. This information was used to update the assessment of the generation of criteria pollutants in excess of air quality district regional thresholds, and Federal De Minimis thresholds, during construction of the proposed water conveyance facilities; exposure of sensitive receptors to health threats from localized particulate matter and Valley Fever in excess of air quality district regional thresholds; creation of potential odors affecting people during construction and operation of the proposed conveyance facilities; and generation of cumulative greenhouse gas emissions during construction and operation of the proposed water conveyance facilities.

Refer to Chapter 22, *Air Quality and Greenhouse Gases*, Section 22.3.3.9, Impacts AQ-1 through AQ-27 in Appendix A for the revised analysis of Alternative 4.

3.3.20 Noise

Chapter 23, *Noise*, of the Draft EIR/EIS was revised based on the revised construction footprint and updated assumptions for pile-driving activities for proposed water conveyance facilities, along with a refined set of construction equipment and schedule assumptions developed for Alternative 4. This information was used to update the assessment of exposure of sensitive receptors and noise-sensitive land uses to vibration or groundborne noise from construction and operation of the water conveyance facilities.

Refer to Chapter 23, *Noise*, Section 23.3.3.9, Impacts NOI-1 through NOI-3 in Appendix A for the revised analysis of Alternative 4.

3.3.21 Hazards and Hazardous Materials

Chapter 24, *Hazards and Hazardous Materials*, of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities for Alternative 4. This information

was used to update the assessment of the creation or exposure of hazardous materials or known hazards sites to people or the environment, as a result of constructing and operating the proposed water conveyance facilities.

Refer to Chapter 24, *Hazards and Hazardous Materials*, Section 24.3.3.9, Impacts HAZ-1 through HAZ-5 in Appendix A for the revised analysis of Alternative 4.

3.3.22 Public Health

Chapter 25, *Public Health*, of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities, including the revised power line alignment and assumptions for Alternative 4. This information was used to update the assessment of increases in public health risks, including vector-borne diseases, exceedances of water quality criteria, increases in constituents known to bioaccumulate, and exposure of people to transmission lines generating EMFs, as a result of constructing and operating the proposed water conveyance facilities.

Refer to Chapter 25, *Public Health*, Section 25.3.3.9, Impacts PH-1 through PH-4 in Appendix A for the revised analysis of Alternative 4.

3.3.23 Minerals

Chapter 26, *Minerals*, of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities for Alternative 4. This information was used to update the assessment of the loss of availability of locally important natural gas wells, extraction potential from natural gas fields, and locally important and known aggregate resource sites as a result of constructing the proposed water conveyance facilities.

Refer to Chapter 26, *Minerals*, Section 26.3.3.9, Impacts MIN-1, MIN-2, MIN-7, and MIN-8 in Appendix A for the revised analysis of Alternative 4.

3.3.24 Paleontological Resources

Chapter 27, *Paleontological Resources*, of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities for Alternative 4. This information was used to update the assessment of destruction of paleontological resources as a result of constructing the proposed water conveyance facilities.

Refer to Chapter 27, *Paleontological Resources*, Section 27.3.3.9, Impact PALEO-1 in Appendix A for the revised analysis of Alternative 4.

3.3.25 Environmental Justice

Chapter 28, *Environmental Justice*, of the Draft EIR/EIS was revised based on the revised construction footprint for proposed water conveyance facilities for Alternative 4. This information was used to update the assessment of disproportionately high and adverse human health or environmental effects on minority and low-income populations as a result of constructing the proposed water conveyance facilities.

Refer to Chapter 28, *Environmental Justice*, Section 28.3.3.9 in Appendix A for the revised analysis of Alternative 4.