

**STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD**

ORDER WR 2019-

In the Matter of Permits 11308 and 11310 (Applications 11331 and 11332)
held by the

United States Bureau of Reclamation

for the Cachuma Project on the Santa Ynez River

SOURCE: Santa Ynez River

COUNTY: Santa Barbara

**ORDER AMENDING PERMITS 11308 AND 11310
(APPLICATIONS 11331 AND 11332)**

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CITING THE RECORD^a

Citations to the hearing record are indicated as follows:

Citations to the Reporter's Transcript:

Citations to the Reporter's Transcripts are indicated by "R.T.", followed by the date of the transcript, followed by the beginning page and line number and the ending page and line number. A colon separates page and line numbers.

For example, testimony from the November 12, 2003 hearing on transcript page 660, starting at line 19 and ending at line 21 would be cited as follows: (R.T., November 12, 2003, p. 660:19-660:21.)

Citations to Exhibits:

All citations in the evidentiary hearing record are designated by the name or abbreviation for the party that submitted the exhibit, followed by the exhibit number and the page number or other location of the cited information in the exhibit, if necessary.

For example, U.S. Department of the Interior: Exhibit 1, page 1 would be cited as follows: (DOI-1, p. 1.)

Citations to 2011 Final Environmental Impact Report:

All citations to the 2011 Final Environmental Impact Report include the volume and page number. The citation may also include additional location information if necessary.

For example, information from page 3.0-11 of Volume II would be cited as follows: (FEIR, Vol. II, p. 3.0-11.)

Citations to the Biological Assessment in FEIR, Vol. III, Appendix C, will be as follows:

- 1) Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River (1999 Biological Assessment) and,
- 2) Revised Section 3 (Proposed Project) of the Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River (2000 Revised Biological Assessment).

^a Citations to the hearing record are provided solely for ease of reference. Often, other supporting evidence exists in the record that is not specifically cited in the order. All transcripts and exhibits are available on the State Water Board's water right hearings web page, at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/cachuma/

LIST OF ACRONYMS

ANA	Above Narrows Account
AMA	Adaptive Management Account
AMC	Adaptive Management Committee
af	acre-feet
afa	acre-feet per annum
BNA	Below Narrows Account
CESA	California Endangered Species Act
CalTrout	California Trout, Incorporated
CCRB	Cachuma Conservation Release Board
CCWA	Central California Water Authority
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cfs	cubic feet per second
COMB	Cachuma Operations and Management Board
CPA	Cachuma Project Authority
CSPA	California Sportfishing Protection Alliance
CVWD	Carpinteria Valley Water District
CUWCC	California Urban Water Conservation Council
DPS	Distinct Population Segment
ESA	federal Endangered Species Act
EDC	Environmental Defense Center
GWD	Goleta Water District
IFIM	Instream Flow Incremental Methodology
Member Units	Cachuma Project Member Units
MOU	Memorandum of Understanding
MWD	Montecito Water District
NMFS	National Marine Fisheries Service
PHABSIM	Physical Habitat Simulation System
Reclamation	United States Bureau of Reclamation
SBCWA	Santa Barbara County Water Agency
Settlement Agreement	Cachuma Project Settlement Agreement
SWP	State Water Project
SYRHM	Santa Ynez River Hydrology Model
SYRTAC	Santa Ynez River Technical Advisory Committee
SYRWCD	Santa Ynez River Water Conservation District
SYRWCD, ID No. 1	Santa Ynez River Water Conservation District, Improvement District No. 1
TDS	Total Dissolved Solids
U.S. Forest Service	United States Forest Service
USFWS	United States Fish and Wildlife Service

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BY THE BOARD:

1.0 INTRODUCTION

In this order, the State Water Resources Control Board (State Water Board or Board) amends the terms and conditions of the U.S. Bureau of Reclamation's (Reclamation) permits for the Cachuma Project (Permits 11308 and 11310 (Applications 11331 and 11332)) to protect public trust resources and downstream water rights on the Santa Ynez River below Bradbury Dam. The State Water Board also approves Reclamation's petition to change the authorized place of use and purposes of use for Permits 11308 and 11310.

The construction and operation of the Cachuma Project, including Bradbury Dam and Cachuma Reservoir, has resulted in a reduction of water available to downstream water right holders and public trust resources. Since the State Water Board issued Permits 11308 and 11310 (Permits) to Reclamation in 1958, the State Water Board has retained authority over the Permits to determine the requirements necessary to protect senior

water rights downstream of Bradbury Dam and the public trust resources in the Santa Ynez River.

State Water Board [Order WR 94-5](#) established a deadline of December 1, 2000, to commence a hearing on the protection of downstream water right holders. The State Water Board held a hearing on that issue and on the issue of the measures needed to protect public trust resources over eight days in 2000, 2003, and 2012.

The Santa Ynez River provides habitat for the Southern California Distinct Population Segment of steelhead trout (*Oncorhynchus mykiss*) (steelhead), which is listed as an endangered species under the federal Endangered Species Act (ESA). (16 U.S.C. §§ 1531-1544.) The Cachuma Project has adversely affected the steelhead fishery by blocking access to the majority of suitable spawning and rearing habitat upstream, and by modifying flows in the mainstem of the lower Santa Ynez River (mainstem) below Bradbury Dam to the point that the survival of the species is uncertain. (E.g., NOAA-12, p. 6.) Currently, Reclamation operates and maintains Bradbury Dam on the Santa Ynez River in accordance with a Biological Opinion issued by the National Marine Fisheries Service (NMFS) on September 11, 2000 (2000 Biological Opinion) pursuant to section 7 of the federal ESA. (16 U.S.C. § 1536.)

Even though Reclamation has operated and maintained Bradbury Dam in accordance with the 2000 Biological Opinion for more than a decade, the steelhead population in the Santa Ynez River remains at a critically low level. The hearing record supports the conclusion that the population is unlikely to be restored to a sustainable level unless the amount of suitable spawning and rearing habitat to which the steelhead have access is increased. The hearing record supports the conclusion that higher flows are likely to benefit steelhead by providing additional spawning and rearing habitat as well as increasing passage opportunities in the lower mainstem river. At the same time, the record supports the need for development of additional information and adaptive management of flows to maximize the benefits of those flows to steelhead and avoid potential impacts during implementation. Weighing the competing uses of water, the Board has found that it is necessary to protect and improve the critical condition of the

remnant Santa Ynez River watershed steelhead population. Therefore, this order requires Reclamation to provide higher flows under an adaptive management process during wet and above normal years when the water supply impacts of such flows would be minimized (Alternative 5C from the State Water Board's 2011 Final Environmental Impact Report (FEIR)).

Even though the higher flows will only be provided in wet and above normal water years these higher instream flow requirements may increase to some extent projected water supply shortages during critically dry periods for those who rely on Cachuma Project water. These shortages are in addition to those already caused by implementation of the 2000 Biological Opinion. (See section 8.1, Finding Regarding Water Supply Impact.) As a result, additional water conservation and increased reliance on alternative water supplies may be necessary to compensate for future shortages during critically dry periods.

In coordination with the California Department of Fish and Wildlife (CDFW) and NMFS, Reclamation will be required to study the effects of the increased flows on steelhead to verify the amount of additional habitat provided by the flows and determine whether a different release schedule would be more beneficial to the fishery. In the unlikely event the results of the study demonstrate that the flows do not provide benefit to the steelhead fishery or are likely to harm the fishery, this order reserves the Board's authority to reduce the required instream flows.

Although additional flows are necessary, the evidence in the record indicates that increasing flows will not be sufficient, without additional measures, to restore the steelhead fishery to good condition. Specifically, passage around Bradbury Dam, where the majority of the historic spawning and rearing habitat occurred and still persists, and other habitat restoration actions by other agencies and private and public interests to address the ecosystem as a whole will be necessary to solve this complex problem of restoring viable steelhead runs in the Santa Ynez River watershed. To improve the state of knowledge concerning the measures necessary to protect the steelhead fishery, this order also requires Reclamation to study the feasibility of additional measures that may

be necessary to restore the fishery, including the feasibility of providing fish passage around Bradbury Dam.

The Cachuma Project contractors and downstream water right holders reached a settlement agreement that resolved actual and potential disputes that existed among the parties relative to the obligation of Reclamation to make releases from Bradbury Dam for the protection of downstream water rights and water quality. Reclamation has requested that the Board amend its Permits to be consistent with this agreement. This order amends Reclamation's Permits to be consistent with its request. The agreement assumes specific operating criteria, currently in place, will govern fish flows below Bradbury Dam. However, as already discussed above, this order requires additional releases for the protection of public trust resources. The parties may need to negotiate changes to the settlement agreement in light of the releases for steelhead required by this order. As such, this order reserves the Board's authority to make any amendments to the Permits that may be necessary based on any changes to the agreement.

2.0 FACTUAL AND PROCEDURAL BACKGROUND

2.1 The Cachuma Project

2.1.1 Project Setting

The Santa Ynez River watershed, located in central Santa Barbara County, encompasses approximately 900 square miles. The Santa Ynez River originates in the San Rafael and Santa Ynez Mountains and flows west approximately 90 miles to the Pacific Ocean. (See Appendix 1, Figure 1.) Bradbury Dam impounds water on the Santa Ynez River, forming Cachuma Reservoir. The dam is located approximately 48.7 river miles upstream from the ocean and effectively divides the watershed in half. Reclamation completed construction of the Cachuma Project in 1953.

The watershed upstream of Cachuma Reservoir is primarily undeveloped open space. Located upstream of Cachuma Reservoir in the upper reaches of the Santa Ynez River are two reservoirs: the first constructed by the City of Santa Barbara in 1920 (Gibraltar Dam and Reservoir) and the second constructed by Montecito Water District (MWD) in

1930 (Juncal Dam and Jameson Reservoir).¹ Lands downstream of Cachuma Reservoir are generally undeveloped, natural open space or in private ownership, with land uses including irrigated and non-irrigated agriculture; residential and urban areas, including the cities of Lompoc, Buellton, and Solvang; the Lompoc Federal Correctional Institution; and Vandenberg Air Force Base. (See Appendix, Figures 1 and Figure 2.)

The Santa Ynez River crosses two groundwater basins downstream of Cachuma Reservoir:

- 1) The Above Narrows Alluvial Groundwater Basin, located upstream of a stretch of the river called the Lompoc Narrows; and
- 2) The Lompoc Plain Groundwater Basin, located downstream of the Lompoc Narrows.

(See Appendix 1, Figure 3.)

The storage capacity of the Above Narrows Alluvial Groundwater Basin when full is approximately 105,000 acre-feet (af), although the usable storage is significantly less than this amount. (FEIR, Vol. II, p. 4.4-3.) The U.S. Geological Survey estimated the groundwater storage in the Lompoc Plain Groundwater Basin to be about 215,000 af. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-14.) Groundwater pumping provides most of the water supply for irrigation, municipal, and industrial uses in the lower Santa Ynez River Basin. (*Ibid.*)

The Santa Ynez River below Bradbury Dam has been divided into reaches for management purposes. The first three reaches downstream of Bradbury Dam are the Highway 154 Reach (Bradbury Dam to the Highway 154 bridge, located 3.2 miles below

¹ Jameson Reservoir, with a 14-square mile tributary watershed, has a maximum storage capacity of 5,300 acre-feet. Gibraltar Reservoir, with a 216-square mile tributary watershed, has a maximum storage capacity of 7,100 acre-feet. Water stored in Jameson Reservoir is diverted to the South Coast through the two-mile-long Doulton Tunnel. Water stored in Gibraltar Reservoir is diverted to the South Coast through the 3.7-mile-long Mission Tunnel. The Cachuma Project facilities are located in the Santa Ynez River Basin and the South Coast area, which occupy the southern half of Santa Barbara County. The South Coast area included in the project is a narrow, highly-populated coastal strip about twenty-five miles long and two to five miles wide, lying between the Santa Ynez Mountains and the Pacific Coast. In this area lies the Cities of Santa Barbara, Goleta, and Carpinteria, as well as the suburban and agricultural lands of Goleta, Summerland, Montecito, and Carpinteria. All of these lands receive water from the Cachuma Project.

Bradbury Dam); the Refugio Reach (Highway 154 bridge to the Refugio Road bridge, located 7.8 miles below Bradbury Dam); and the Alisal Reach (Refugio Road bridge to the Alisal bridge, located 10.5 miles below Bradbury Dam). (See Appendix 1, Figure 2.) Major tributaries of the Santa Ynez River located downstream of Cachuma Reservoir include Hilton Creek, Quiota Creek, Alisal Creek, Nojoqui Creek, El Jaro Creek, Salsipuedes Creek and San Miguelito Creek. As discussed below, these lower Santa Ynez River tributaries provide spawning and rearing habitat below Bradbury Dam. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-68.)

2.1.2 Cachuma Project Operations

The Cachuma Project provides water to the Member Units for irrigation, domestic, municipal, and industrial uses. The Member Units consist of the City of Santa Barbara; Goleta Water District (GWD); MWD; Carpinteria Valley Water District (CVWD); and the Santa Ynez River Water Conservation District, Improvement District No. 1 (SYRWCD, ID No. 1). Water from Cachuma Reservoir is delivered to all of the Member Units, except SYRWCD, ID No. 1.

Reclamation owns all Cachuma Project facilities and operates Bradbury Dam. In 1956, the Member Units assumed responsibility for operation and maintenance of Cachuma Project facilities other than Bradbury Dam. The Member Units formed the Cachuma Operations Management Board (COMB) to carry out this responsibility.²

Project deliveries to the Member Units begin with the diversion and storage of Santa Ynez River water at Lake Cachuma behind Bradbury Dam pursuant to the Permits. (DOI-1, p. 6.) Water is stored and diverted through the Tecolote Tunnel³ to the south coast area via the South Coast Conduit, then delivered to the individual water users through

² COMB is a California Joint Powers Agency formed in 1956 pursuant to an agreement with Reclamation. COMB is responsible for diversion of water to the South Coast through the Tecolote Tunnel, and operation and maintenance of the South Coast Conduit pipeline, flow control valves, meters, and instrumentation at control stations, and turnouts along the South Coast Conduit and at four regulating reservoirs.

³ Initial deliveries using the Tecolote Tunnel began in 1955. Tecolote Tunnel extends 6.4 miles through the Santa Ynez Mountains from Cachuma Lake to the headworks of the South Coast Conduit. (FEIR, Vol. II, p. 2.0-1.)

distribution systems operated by the Member Units, with a small amount of water, an average of approximately 180 acre-feet per annum (afa), being diverted directly from the lake for the County park facilities. (*Ibid*; see Appendix 1, Figure 4.) In 1996, the original 32,000 afa safe yield of the Cachuma Project was reduced to an agreed “Sustained Annual Yield” of 25,714 afa.⁴ (FEIR, Vol. II, p. 2.0-3; DOI-30, p. 6.) As part of the hearing, Reclamation submitted Cachuma Project delivery data from its Annual Water Right Progress Reports by Permittee to the State Water Board for the period 1958-1998. (DOI-1d.) During the period of record, an average of approximately 25,000 afa of Project water was delivered to the Member Units.

Since 1997, the Central Coast Water Authority (CCWA) has delivered imported State Water Project (SWP) water to Cachuma Reservoir for use by the Member Units to supplement local water supplies. The SWP water is pumped via the Santa Ynez Extension through the existing Bradbury Dam outlet works into Cachuma Reservoir. The commingled water is then delivered through Tecolote Tunnel to the Member Units. The Member Units’ SWP contractual allocations are described in the Final EIR. (FEIR, Vol. II, p. 2.0-11.) SYRWCD, ID No. 1 receives its SWP allocation by direct delivery from the CCWA pipeline and exchanges its allocation of Cachuma Project water for an equal amount of SWP water that would have been delivered to the Member Units. (FEIR, Vol. II, pp. 2.0-11 to 2.0-13.)

2.1.3 Project Release Requirements

Before contract deliveries are made to the Member Units, Reclamation must meet its water right release requirements to satisfy downstream water rights pursuant to the conditions of its water right permits and must satisfy the flow requirements included in

⁴ In 1949, Reclamation and Santa Barbara County Water Agency executed the Cachuma Project Master Water Service Contract (Master Contract). The 40-year master contract provided for the delivery of the entire yield of the Cachuma Project to the Santa Barbara County Water Agency on behalf of the Member Units. (DOI-7, p. 3.) The Master Contract was renewed and executed on April 14, 1996 and is effective as of May 15, 1995 through September 30, 2020 (DOI-30, p. 6.) Under the renewed Master Contract and the Member Units’ individual contracts, the original entitlement to the safe yield of 32,000 af was reduced to an agreed “Sustained Annual Yield” of 25,714 afa. (FEIR, Vol. II, p. 2.0-3; DOI-30, p. 6.) The Member Units’ allocations or annual deliveries based on the operational yield of 25,714 afa are: 1) CVWD (10.94%); 2) City of Santa Barbara (32.19%); 3) GWD (36.25%); 4) MWD (10.31%); and 5) SYRWCD, ID No. 1 (10.31%). (DOI-30, p. 6.)

NMFS' 2000 Biological Opinion to protect steelhead spawning, rearing, and migration in the lower Santa Ynez River. (DOI-1, p. 5, SWRCB-11.) Flows to meet downstream water right requirements and fisheries requirements are either released via the outlet works of Bradbury Dam or via the Hilton Creek Pipeline.

Reclamation makes downstream water right releases in accordance with the revised operational procedures included in State Water Board Order WR 73-37 (amended by State Water Board Orders WR 78-10, 88-2, and 89-18) (as further discussed in section 2.2). The procedures only require releases when depleted groundwater storage between Bradbury Dam and the Narrows near Lompoc exceeds 10,000 acre-feet. (DOI-1, p. 8; MU-105.) The allowable deficit provides opportunities to conserve Cachuma Project supplies by allowing tributary runoff originating below the dam to recharge the groundwater basin before Project releases are needed. (DOI-1, p. 8.)

2.1.4 Downstream Water Right Holders

The history of Santa Ynez River water use is contentious, and issues raised by water right holders downstream of the three Santa Ynez River dams have been addressed over the years in litigation, in State Water Board decisions, and by agreements reached between the parties involved. Water rights downstream of Bradbury Dam consist of appropriative and riparian rights to divert water from the Santa Ynez River, and overlying and appropriative rights to divert groundwater from groundwater basins that, under natural conditions, the river would recharge.⁵

There are two primary water supply interests concerned with Cachuma Project water use - the Santa Ynez River Water Conservation District (SYRWCD) and the City of Lompoc. The SYRWCD was formed in 1939 to protect and augment the water supplies for residents, including Cachuma Project supplies, of two non-contiguous parcels that encompass approximately 180,000 acres including most of the Santa Ynez River watershed from about three miles downstream of Bradbury Dam to the mouth of the river. The City of Lompoc supplies groundwater pumped from the Lompoc Plain Groundwater

⁵ The Final Environmental Impact Report, prepared in connection with this order, lists known water right holders in Table 3-1a. (FEIR, Vol. II, p. 3.0-3.)

Basin to its residents for domestic use. The City of Lompoc acts to ensure that sufficient water is released from Bradbury Dam so that the Cachuma Project does not interfere with its downstream water rights nor adversely affect the quality of water recharged from the Santa Ynez River. (MU-220A, p. 2.) Both the SYRWCD and the City of Lompoc have had active roles in the previous State Water Board decision and orders discussed below.

2.2 State Water Board Decision 886 and Subsequent Orders

In 1958, the State Water Board's predecessor, the State Water Rights Board, adopted [Decision 886](#) and issued the Permits to Reclamation for the Cachuma Project. The Permits authorize Reclamation to divert and store water from the Santa Ynez River using Cachuma Project facilities. Permit 11308 authorizes the direct diversion of 100 cubic feet per second (cfs) and the diversion to storage of 275,000 afa for purposes of domestic use, salinity control, incidental recreational use, and irrigation. Permit 11310 authorizes the direct diversion of 50 cfs and the diversion to storage of 275,000 afa for purposes of municipal, industrial, and incidental recreational uses. The combined maximum amount of water that may be diverted to storage under both Permits is 275,000 afa. Under both Permits, the authorized season of direct diversion is year-round and the authorized season of diversion to storage is from October 1 of each year to June 30 of the following year.

Decision 886 required Reclamation to release enough water to both satisfy downstream senior water right holders, and to maintain natural groundwater recharge from the Santa Ynez River. Decision 886 required Reclamation to make all releases of water past Bradbury Dam in such a manner as to maintain a live stream at all times as far below the dam as possible, consistent with the purposes of the Cachuma Project and the protection of downstream users.

Decision 886 required Reclamation to conduct various investigations and studies to determine the amount, timing, and rate of releases necessary to satisfy downstream water rights, and maintain percolation of water in the stream channel that would have been present absent Bradbury Dam. Decision 886 reserved authority over the Permits

for 15 years to make subsequent orders concerning releases of water for downstream use and groundwater recharge.

On July 5, 1973, the State Water Board issued [Order WR 73-37](#) allowing Reclamation to store inflow in Cachuma Reservoir regardless of whether there was a live stream. The State Water Board found that approval of Reclamation's plan of operation, which would maintain groundwater storage space in the aquifer downstream of Bradbury Dam, would result in increased percolation and conservation of inflow to the Santa Ynez River downstream from the dam. (Order WR 73-37, p. 2.) Instead of the "live stream" requirement, Order WR 73-37 established two accounts – the Above Narrows Account (ANA) and the Below Narrows Account (BNA) – to provide for the replenishment of the groundwater basins above and below the Lompoc Narrows. Order WR 73-37 required water to be credited to and released from the accounts in accordance with a detailed formula set forth in the order. Order WR 73-37 also required Reclamation to monitor the impacts of the release schedule on riparian vegetation and retained continuing authority by the State Water Board over the Permits for an additional 15 years.

[Order WR 78-10](#), adopted on July 5, 1978, changed the required methodology used to measure water releases from Cachuma Reservoir made to satisfy downstream rights, and continued the Board's reserved authority until December 31, 1989.

On September 21, 1989, the State Water Board adopted [Order WR 89-18](#), which amended Reclamation's Permits to include new accounting, monitoring, and operating procedures proposed by Reclamation and agreed to by the users downstream of Bradbury Dam. Order WR 89-18 extended continuing authority until December 31, 1994, and extended the riparian vegetation monitoring requirement for a minimum of five years. Order WR 89-18 also addressed a complaint filed on November 13, 1987, by the California Sportfishing Protection Alliance (CSPA). CSPA's complaint alleged that the construction and operation of the Cachuma Project had severely impacted steelhead trout, and that such action constituted a misuse of water within the meaning of article X, section 2, of the California Constitution. Order WR 89-18 addressed the complaint by

directing State Water Board staff to hold a hearing on CSPA's complaint as soon as possible.

In July 1990, the State Water Board began a consolidated hearing on all outstanding issues in the Santa Ynez River watershed, including the State Water Board's reservation of authority over Reclamation's Permits and CSPA's complaint. However, the hearing was recessed in August 1990 to allow the parties to resolve technical issues outside the hearing process.

On December 20, 1990, the State Water Board Chair wrote to the parties explaining that before the Board could act on the pending matters, three documents were required:

- 1) An environmental impact report;
- 2) A determination of the availability of unappropriated water; and
- 3) An evaluation of the potential mitigation measures for the remnant steelhead fishery, rare and endangered species, and related habitats.

The State Water Board scheduled hearings again in 1994, but Reclamation requested that the State Water Board postpone the hearings in order to:

- 1) Collect additional well data;
- 2) Implement a riparian vegetation study required by the State Water Board; and
- 3) Collect data on fish in the river pursuant to a 1994 MOU between Reclamation, the CDFW,⁶ U.S. Fish and Wildlife Service (USFWS), Cachuma Conservation Release Board (CCRB),⁷ SYRWCD, Santa Barbara County Water Agency (SBCWA), and the City of Lompoc.

Because Order WR 89-18 only extended the reserved authority until December 31, 1994, the State Water Board issued Order WR 94-5 on November 17, 1994, continuing the reservation of authority over Reclamation's Permits until long-term permit conditions

⁶ CDFW was named the California Department of Fish and Game in 1994. Effective January 1, 2013, the official name changed from California Department of Fish and Game to California Department of Fish and Wildlife.

⁷ CCRB is a joint powers agency that was formed in 1973 by four of the Member Units: CVWD, the City of Santa Barbara, GWD, and MWD. CCRB was established to represent its members in protecting their interest in Cachuma Project water rights. In January 2011, CVWD withdrew its membership.

could be set to protect downstream water right holders. The order established a deadline of December 1, 2000, to commence a hearing on this issue. The order also required Reclamation to make releases from the Cachuma Project for the benefit of fish in accordance with the 1994 MOU. Additionally, Order WR 94-5 required Reclamation to conduct various studies and collect certain data for use by the State Water Board in the hearing. Order WR 94-5 required Reclamation to submit, not later than February 1, 2000:

- 1) Reports and data resulting from the 1994 MOU;
- 2) A report on the riparian vegetation monitoring program;
- 3) Information developed and conclusions reached during ongoing negotiations between the Member Units and the City of Lompoc; and
- 4) A report on the impacts of the Cachuma Project on downstream diverters.

Lastly, Order WR 94-5 required Reclamation to prepare any additional environmental documentation that the Division of Water Rights (Division) Deputy Director (Deputy Director) determined was necessary to comply with the California Environmental Quality Act (CEQA) in connection with the State Water Board's consideration of modifications to Reclamation's Permits. The Deputy Director was required to determine what, if any, additional environmental documentation was needed by March 1, 2000, and Reclamation was required to submit a draft of any required documentation to the State Water Board by July 31, 2000.

2.3 Petition to Change Permits 11308 and 11310

2.3.1 Background

The authorized place of use under Reclamation's Permits, which were issued on March 21, 1958, was designated by Map B-1P-21 (Sheets 1 and 2) for GWD, the City of Santa Barbara, MWD, the Summerland County Water District, CVWD, and SYRWCD.⁸ (Staff Exhibits 1 and 2.)⁹ The place of use for irrigation under Permit 11308 is 61,000 net

⁸ At the time of permit issuance, GWD was known as Goleta County Water District, MWD was known as Montecito County Water District and CVWD was known as Carpinteria County Water District.

⁹ State Water Board Staff Exhibits 1 and 2 consist of the application files for Application 11331 (Permit 11308) and Application 11332 (Permit 11310), which contain copies of both the permits and the map depicting the existing place of use.

irrigable acres, within a gross area of 175,000 acres along the south coastal area of Santa Barbara County. Use of water for recreational purposes is at the Cachuma Reservoir site. (*Ibid.*)

2.3.2 Reclamation's 1983 Petition for Change

On August 8, 1983, Reclamation filed with the State Water Board a petition for change in place of use and purpose of use. (DOI-2b.) Under this petition, Reclamation sought to increase the place of use under both Permits from a gross area of 175,000 acres, to a gross area of 296,697 acres, with the net irrigated area to remain at 61,000 acres. (*Ibid.*) The purpose of the proposed change was to include within the place of use for the Permits, "areas that have present or future potential for agricultural and/or subdivision development and to include changes in local district boundaries." (DOI-2b.) This change included adding the Cachuma Recreation Area and the service area of the then newly annexed SYRWCD, ID No. 1. Reclamation's petition also sought to add municipal and industrial uses and delete stock watering as a use under Permit 11308, and to add domestic and salinity control uses under Permit 11310. (*Ibid.*) The State Water Board issued public notice of Reclamation's petition on December 2, 1983. The Board re-noticed the petition on January 12, 1984, because of an inaccurate description in the original notice. (DOI-2, p. 11.) The record shows that the State Water Board did not receive any protests and the State Water Board did not take further action on the petition for an extended period of time.

As described below, Reclamation made several amendments to its petition during the period 1983 to 1997.

2.3.3 1995 Amendments to Reclamation's 1983 Petition for Change

In response to a Division inquiry dated February 28, 1995, regarding the status of Reclamation's 1983 petition, Reclamation amended the 1983 change petition to:

- 1) Expand the existing place of use boundary to include the current service areas of the Member Units; and
- 2) Consolidate the seven purposes of use under the Permits.

(DOI-2e.)

The first amendment to Reclamation's petition, if approved, would increase the existing place of use from the gross area of 175,000 acres to approximately 192,600 acres, an increase of 17,600 acres (and a reduction of 104,097 acres relative to the number of acres originally requested in the 1983 Change Petition), and reduce the net irrigable acreage from 61,000 acres to 40,250 acres.¹⁰

The second amendment Reclamation made to its petition, if approved, would change the Permits so that they each authorize the same seven purposes of use. This additional change would add municipal and industrial uses as purposes of use under Permit 11308 and irrigation, domestic use, salinity control, and stock watering as purposes of use under Permit 11310. Combined, the consolidated purposes of use under both Permits would allow water under Permit 11308 and Permit 11310 to be used for irrigation, municipal, industrial, domestic, salinity control, incidental recreation, and stock watering purposes. (DOI-2, p. 13.)

2.3.4 1996 Amendments to Reclamation's 1983 Petition for Change

On October 1, 1996, Reclamation notified the State Water Board that additional amendments to its 1983 change petition were necessary. (DOI-2g.) The primary purpose of these amendments was to remove from the proposed place of use the area of the SYRWCD (Parent District) presently within the authorized place of use and outside of the boundary for the SYRWCD, ID No. 1, a Member Unit. (DOI-2, p. 14.) Reclamation's requested amendments included supporting information that indicated that the number of acres within the authorized place of use is 187,870 acres (with SYRWCD (Parent District) included) and the number of acres proposed to be added to the Member Units' service areas authorized place of use was 17,506 (not 17,600).¹¹ (DOI-2g, p. 2.)

¹⁰ By letter dated December 7, 1995 (DOI-2f.), Reclamation submitted to the State Water Board the maps showing the permitted place of use for Permits 11308 and 11310 and the proposed place of use boundary, as amended by the June 16, 1995 amendment to the 1983 change petition. Exhibits DOI-3b, DOI-3c, and DOI-3d are copies of the maps that were submitted with Reclamation's December 7, 1995 letter: Map No. 368-208-899, "Cachuma Project—Overall;" Map No. 368-208-900, "Cachuma Project, Enlarged View of Santa Ynez River Basin;" and Map No. 368-208-901, "Cachuma Project, Enlarged View of South Coast Region."

¹¹ Reclamation's existing and proposed place of use acreage figures are computer-generated. (DOI-2g, p. 2.)

2.3.5 Protests to Amended Petition for Change

On May 22, 1997, the State Water Board issued notice of the amended petition to change the place of use and purpose of use for the Permits. The State Water Board received six protests in response to the notice from the City of Solvang, Mr. Steve Jordan, CSPA, CDFW, SYRWCD, and the City of Lompoc. By letters dated December 6, 1999, the Division canceled the protests submitted by the City of Solvang, Mr. Jordan, CSPA, and CDFW,¹² and dismissed the protest submitted by SYRWCD.¹³ The protest filed by City of Lompoc remained unresolved. (State Water Board, Staff Exhibit-1: Application 11331 (Permit 11308 – Cat. 1, Vol. 36.)

Due to the changes to the petition described above, the State Water Board has given notice of the petition three times (12/2/83, 1/12/84, and 5/22/97). As amended, Reclamation's change petition requests to enlarge the original place of use boundary to conform with the boundaries of the current contract service areas of the Member Units, which were established pursuant to several annexations. The proposed place of use is 205,376 acres (187,870 acres + 17,506 acres = 205,376 acres). (DOI-2h; see also DOI-2g, p. 2.)

2.3.6 Reclamation's 1999 "Dos Pueblos Golf Links Project" Petition for Change

On February 17, 1999, Reclamation filed a separate change petition at the request of GWD to include an additional 130 acres (Dos Pueblos Golf Links Project site) to its place of use under the Permits. The potential impacts of the change petition for the Dos Pueblos Golf Links project were evaluated in an Addendum to the Final Environmental Impact Report for the project, prepared by GWD and the County of Santa Barbara.

In response to an inquiry from the State Water Board regarding the status of Reclamation's 1999 Petition to add the "Dos Pueblos Golf Links Project" site to

¹² The protests from the City of Solvang, Mr. Jordan, CSPA, and CDFW were canceled based on the parties' failure to provide information requested by the State Water Board within the period provided pursuant to Water Code section 1335.

¹³ By letter dated October 6, 1997, Reclamation notified the State Water Board of an agreement between Reclamation, the Member Units and SYRWCD. (DOI-2h.) Pursuant to the stipulation, which was used as a basis to resolve SYRWCD's protest, Reclamation and the Cachuma Project beneficiaries agreed to allow that portion of the SYRWCD (Parent District) which is outside SYRCWD, ID No. 1, but presently within the authorized place of use, to remain within the authorized place of use. (*Ibid.*)

Reclamation's place of use under the Permits, on November 6, 2012, Reclamation submitted a letter it received from GWD. The letter indicated that the golf course was no longer being pursued, but instead two single-family homes were planned for the property. The letter further indicated that the environmental document for that project would not be considered until February 2013, which was after the hearing record closed on April 5, 2012.

As a result, on February 7, 2013, the State Water Board advised Reclamation and GWD that, because an environmental document for the single-family home project is not part of the hearing record, the State Water Board could not process Reclamation's 1999 petition as part of the current proceeding to consider amendments to the Permits.

2.4 2002 Settlement Agreement

On December 17, 2002, CCRB; SYRWCD; SYRWCD, ID No. 1; and the City of Lompoc entered into a settlement agreement (Settlement Agreement) that resolved disputes between the parties concerning Reclamation's obligation to make releases from Bradbury Dam for the protection of downstream water rights. (MU-220A.) The parties agreed that releases pursuant to State Water Board Order WR 89-18, with three technical modifications, would adequately protect downstream water rights. (*Id.*, pp. 4-5.) The Settlement Agreement is predicated on the presumption that the 2000 Biological Opinion for the Cachuma Project would continue to govern releases from Bradbury Dam for the protection of fishery resources. The parties agreed to support operation of the project in accordance with the 2000 Biological Opinion as the preferred approach to address public trust resource protection. (*Id.*, pp. 4-5, 7.) The Settlement Agreement provides for conjunctive operation of water rights releases and releases made pursuant to the 2000 Biological Opinion to reduce impacts to Cachuma Project water supply. In addition, the Settlement Agreement provides for conjunctive operation of the BNA. (*Id.*, pp. 4-5.) The Settlement Agreement states that it will not become effective unless the State Water Board adopts an order that amends Reclamation's Permits accordingly without any material changes. (*Id.*, p. 7.) Similarly, the Settlement Agreement states that any party may terminate the agreement if the Board does not adopt an order that requires water right releases in a manner consistent with the agreement. (*Id.*, pp. 7-8.)

2.5 Evidentiary Hearings

As set forth in section 2.2 above, State Water Board Order WR 94-5 established a deadline of December 1, 2000, to commence a hearing to consider what conditions should be included in the Cachuma Project Permits to protect downstream water right holders. The order also established a deadline of July 31, 2000, for Reclamation to submit a draft of any environmental documentation necessary to comply with CEQA in connection with the State Water Board's consideration of modifications to Reclamation's Permits. Because the CEQA documentation was not completed by the December 1, 2000 deadline to commence the hearing, the State Water Board held the hearing in two phases.

The State Water Board issued a notice of public hearing on September 25, 2000. Phase 1 of the hearing was held on November 6, 2000. Phase 2 was held on October 21, 22, 23, and November 12, 13, 2003. Two additional hearing days were held on March 29 and 30, 2012, to receive evidence relevant to the admission of the Final Environmental Impact Report (FEIR) into the administrative record. In an April 5, 2012 letter to the Cachuma Project Service List, the hearing officer, Board Member Tam Doduc, admitted the FEIR into the administrative record and closed the hearing record.

The State Water Board held the Phase 1 hearing to receive evidence to determine whether: 1) approval of the petitions for change in place of use and purpose of use under Reclamation's Permits would result in any changes in Cachuma Project operations and flows in the Santa Ynez River and 2) Reclamation's compliance with Order WR 94-5. The State Water Board held the Phase 2 hearing to receive evidence to determine:

- 1) Whether modifications in permit terms and conditions for Reclamation's Permits are necessary to protect public trust resources [upstream and downstream of Bradbury Dam including but not limited to fishery resources in the Santa Ynez River] and water right holders on the Santa Ynez River below Bradbury Dam, and
- 2) Whether to approve Reclamation's change petitions requesting modifications in place and purpose of use for the Permits.

2.5.1 Cachuma Hearing Phase 1

The Phase 1 key hearing issues as listed in the September 25, 2000 hearing notice are:

Key Issue 1:

Change Petitions: Would approval of the petitions for change in purpose and place of use result in any changes in Cachuma Project operations and flows that would exist if water from the Project were delivered only to the areas within the current place of use?

Key Issue 2:

Compliance: Has Reclamation complied with Order 94-5? If not, what enforcement or other action, if any, should the [Board] take?

During the Phase 1 hearing, Reclamation, CCRB, SYRWCD, ID No. 1, and the City of Solvang presented cases-in-chief. The City of Lompoc, SYRWCD, and the City of Santa Barbara limited their participation to policy statements, opening statements, and/or cross-examination of witnesses.

For related discussion of Key Issues 1 and 2, see section 7.0 Change Petition and section 9.0 Compliance with Order 94-5, respectively.

2.5.2 Cachuma Hearing Phase 2

The Phase 2 Key Issues, as set forth in the August 13, 2003 supplemental hearing notice¹⁴ are:

Key Issue 3: Should Permits 11308 and 11310 be modified to protect public trust resources?

- a. What flow requirements, including magnitude and duration of flows released from Bradbury Dam, are necessary to protect public trust resources, including, but not limited to, steelhead, red-legged frog, tidewater goby and wetlands, in the Santa Ynez River downstream of Bradbury Dam? What terms, conditions, or recommendations contained in the [2000] Biological Opinion, if any, should be incorporated into Reclamation's water right permits?

¹⁴ The key hearing issues for Phase 2 of the hearing that were listed in the first hearing notice, dated September 25, 2000, were modified in the supplemental Phase 2 hearing notice dated August 13, 2003. In the May 29, 2003 letter, Hearing Officer Pete Silva stated that consistent with the hearing notice he intended to allow parties to present evidence concerning whether Reclamation's permits should be modified to address any impacts of Cachuma Project operations to public trust resources above Bradbury Dam, including evidence concerning requirements that would apply above the dam.

- b. What other measures, if any, are necessary to protect public trust resources?
- c. How will any proposed measures designed to protect public trust resources affect Reclamation and the entities that have water supply contracts with Reclamation?
- d. What water conservation measures could be implemented in order to minimize any water supply impacts?

For related discussion of Key Issue 3, see section 5.0 Protection of Public Trust Resources.

Key Issue 4: Has any senior, legal user of water been injured due to changes in water quality resulting from operation of the Cachuma Project?

- a. Has operation of the Cachuma Project affected water quality in the Lompoc Plain[] groundwater basin in a manner that impairs any senior water right holder's ability to beneficially use water under prior rights?
- b. What permit terms, if any, should be included in Reclamation's water right permits to [protect] senior water right holders from injury due to changes in water quality?

Key Issue 5: Has operation of the Cachuma Project injured any senior water right holders through reduction in the quantity of water available to serve prior rights and, if so, to what extent?

- a. Condition 5 of Permits 11308 and 11310, as modified by Order 89-18, establishes an accounting methodology to determine the quantity of water that is available to serve prior rights on the Santa Ynez River downstream of Cachuma Reservoir. Should the accounting methodology be modified to protect prior rights or take into account new water supplies?
- b. What other permit terms, if any, should be included in Reclamation's water right permits to protect senior water right holders from injury due to a reduction in the quantity of water available?

Key Issue 6: Should Reclamation's water right permits be modified in accordance with the Settlement Agreement Between Cachuma Conservation Release Board, Santa Ynez River Water Conservation District, Santa Ynez River Water Conservation District Improvement District No. 1, and the City of Lompoc Relating to the Operation of the Cachuma Project? Specifically, should Reclamation's water right permits be modified in

accordance with the two enclosures submitted to the [Board] by Reclamation under cover of letter dated February 26, 2003, entitled “Proposed Modifications to WR 73-37 as amended by WR 89-18 Pertaining to Permits 11308 and 11310 (Applications 11331 and 11332)” and “Revised USBR Exhibit 1, February 1, 2003”?

For related discussion of Key Issues 4, 5 and 6, see section 6.0 Protection of Downstream Water Rights.

Key Issue 7: Should the petitions for change in purpose and place of use be approved?

- a. Will approval of the change petitions operate to the injury of any legal user of the water involved?
- b. Will approval of the change petitions adversely affect fish, wildlife, or other public resources?

For related discussion of Key Issue 7, see section 7.0 Change Petition.

During the Phase 2 hearing, Reclamation; CCRB; SYRWCD, ID No. 1; SYRWCD; the City of Lompoc; the City of Solvang; the County of Santa Barbara; CDFW; NMFS; and California Trout, Incorporated (CalTrout) presented cases in chief.¹⁵ The Santa Barbara Urban Creeks Council, San Lucas Ranch, Carpinteria Valley Association, Citizens of Goleta Valley, and the River Committee presented policy statements.

3.0 LEGAL BACKGROUND

3.1 State Water Resources Control Board’s Authority

The State Water Resources Control Board has broad authority to set flows and take other measures needed to protect fisheries and other public trust resources. This authority is provided by article X, section 2 of the California Constitution, Water Code sections 100 and 275, the Public Trust Doctrine as articulated by the California Supreme Court in

¹⁵ CSPA filed a Notice of Intent to Appear at Phases 1 and 2 of the Cachuma Project Hearing, but CSPA did not submit any exhibits or attend either phase of the hearing. Therefore, the State Water Board hereby dismisses CSPA’s November 13, 1987 complaint for failure to appear. (See Cal. Code Regs., tit. 23, § 766.)

National Audubon Society v. Superior Court (1983) 33 Cal.3d 419 (*Audubon*), and Water Code sections 1243 and 1253.

3.1.1 The Reasonable Use Doctrine

All water rights are subject to the reasonable use doctrine set forth in article X, section 2 of the California Constitution and Water Code sections 100-101. (*Peabody v. Vallejo* (1935) 2 Cal.2d 351, 366-367.) Both article X, section 2 of the Constitution and Water Code section 100 establish the state policy that the water resources of the state should be put to beneficial use to the fullest extent possible. In addition, article X, section 2 and section 100 prohibit the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water. Water Code section 275 directs the State Water Board to take all appropriate proceedings or actions to prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion.

What constitutes an unreasonable use, method of use, or method of diversion depends on the facts and circumstances of each case, and may change if circumstances change. (*Joslin v. Marin Municipal Water Dist.* (1967) 67 Cal.2d 132, 139-140; *Tulare Irr. Dist. v. Lindsay Strathmore Irr. Dist.* (1935) 3 Cal.2d 489, 567.) Competing water demands and beneficial uses of the water must be considered in determining the reasonableness of a particular water use, method of use, or method of diversion. A particular use, method of use, or method of diversion may be unreasonable based on its impact on fish, wildlife, or other instream beneficial uses. (See *Environmental Defense Fund, Inc. v. East Bay Municipal Utility District* (1980) 26 Cal.3d 183, 191, 200.)

3.1.2 The Public Trust Doctrine

The Public Trust Doctrine protects public uses of navigable water bodies, including navigation, commerce, fishing, recreation, and the preservation of fish and wildlife habitat. (*Audubon, supra*, 33 Cal.3d at pp. 434-435.) In addition, title to fisheries in both navigable and non-navigable water bodies is held by the state in trust for the benefit of the public, and the state may take action to protect its interest in the fisheries from harm. (*People v. Truckee Lumber Co.* (1897) 116 Cal. 397, 400-401; *People v. Monterey Fish Products*

Co. (1925) 195 Cal. 548, 563.) This may include instream flow requirements and fish passage requirements, as appropriate.¹⁶

In *Audubon*, the seminal case on the California Public Trust Doctrine, the California Supreme Court held that the Public Trust Doctrine imposes upon the State Water Board a duty of continuing supervision over the appropriation and use of water. (*Audubon, supra*, 33 Cal.3d at pp. 446-447.) The Court held that, in addition to considering the public trust when acting on water right applications, the State Water Board has the authority to reconsider the impacts of long-standing diversions on public trust uses in light of current knowledge or needs. (*Ibid.*) Under the Public Trust Doctrine, the State Water Board must protect public trust uses, to the extent feasible and consistent with the public interest. (*Ibid.*)

Pursuant to the reasonable use and public trust doctrines, the State Water Board includes a standard term in all water right permits and licenses, confirming the State Water Board's continuing authority to impose additional requirements or limitations in permits and licenses in order to protect public trust uses or prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water. (Cal. Code Regs., tit. 23, § 780, subd. (a).) This standard term has been included in Reclamation's Permits.¹⁷

3.1.3 Water Code Sections 1243 and 1253

Water Code section 1243 provides:

The use of water for recreation and preservation and enhancement of fish and wildlife resources is a beneficial use of water. In determining the amount of water available for appropriation for other beneficial uses, the board shall take into

¹⁶ NMFS's comment letter on the draft order emphasized that fish passage is necessary to protect the highly migratory southern California steelhead. (See NMFS, December 8, 2016 comment letter, p. 4.) The record also includes significant information that supports this conclusion: R.T., October 23, 2003, p. 509:10-509:14, p. 516:4-516:14, pp. 519:22 to 520:1, pp. 526:12 to 527:1, pp. 548:8 to 549:6. R.T., November 12, 2003, pp. 645:15 to 646:7, p. 727:5-727:19, pp. 736:20 to 737:1, p. 785:5-785:17, pp. 786:20 to 787:11, p. 811:5-811-16. DFG-1, p. 6, DFG-4, p. 7, NOAA-6, pp. 3-4, and CT-30, pp. 3-4.

¹⁷ Section 8 of the Reclamation Act of 1902, codified at 43 U.S.C. section 383, requires that Reclamation projects be operated in compliance with state water law. In *California v. United States* (1978) 438 U.S. 645, 675, the U.S. Supreme Court confirmed that this statute requires Reclamation to follow state water rights law and that California may impose conditions on permits which it grants to the United States with respect to irrigation projects.

account, whenever it is in the public interest, the amounts of water required for recreation and the preservation and enhancement of fish and wildlife resources.

Water Code section 1253 states:

The board shall allow the appropriation for beneficial purposes of unappropriated water under such terms and conditions as in its judgment will best develop, conserve, and utilize in the public interest the water sought to be appropriated.

As discussed in sections 3.1.1 and 3.1.2 above, the state has continuing authority to regulate water use under the reasonable use and public trust doctrines. In addition to other applicable statutes, the legislative directives of Water Code sections 1243 and 1253 guide the State Water Board's use of its continuing authority over water diversion and use.

3.2 Fish and Game Code Section 5937

Fish and Game Code section 5937 provides in pertinent part:

The owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam.

Section 5937 is a legislative expression of the reasonable use and public trust doctrines, which the State Water Board considers when exercising its authority under those doctrines. (See *California Trout, Inc. v. State Water Resources Control Board* (1989) 207 Cal.App.3d 585, 622-625, 631; State Water Board Order WR 95-2, p. 6.) When fish below a dam are not in good condition, the reasonable use and public trust doctrines may compel further action to restore fish to good condition again. This order uses the term “restore” as a shorthand reference for the concept of keeping fish below a dam in good condition, as required by existing law, when the fish are not currently in good condition.

CDFW's December 9, 2016 comment letter recommended use of the California Coastal Salmonid Population Monitoring: Strategy, Design, and Methods (Monitoring Plan) to help determine whether fish are in good condition in the Santa Ynez River. CDFW and NMFS developed the Monitoring Plan to measure progress toward recovery of California's salmon and steelhead populations under the California Endangered Species Act (CESA)

and the ESA. The conceptual framework used in the Monitoring Plan assesses salmonid viability in terms of four key population characteristics: abundance, productivity, spatial structure, and diversity. (California Department of Fish and Wildlife, December 9, 2016 comment letter, p.3.)

3.3 Salmon, Steelhead Trout, and Anadromous Fisheries Program Act

Legislative policy with respect to protection of anadromous fisheries¹⁸ is set forth in the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act, enacted in 1988. The Act emphasizes the importance of protecting and increasing the naturally spawning salmon and steelhead trout of the State in order to provide a valuable public resource, a large statewide economic benefit, and employment opportunities not otherwise available. (Fish & Game Code, § 6901.) The Act establishes state policy to “significantly increase the natural production of salmon and steelhead trout by the end of [the twentieth] century.” (*Id.*, § 6902, subd. (a).) In establishing fishery protection flows for the Santa Ynez River and ordering studies of passage around Bradbury Dam, the State Water Board is obligated to consider the Legislature’s policy regarding the importance of protecting and increasing the natural production of steelhead trout.

Pursuant to the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act, CDFW developed the Steelhead Restoration and Management Plan for California in 1996. (DFG-2.) Among other things, the plan recommends:

- 1) The establishment of a flow regime from Bradbury Dam to restore the steelhead fishery and maintain it in good condition;
- 2) The investigation of the feasibility of providing passage around Bradbury Dam;
- 3) The restoration and enhancement of spawning and rearing habitat in tributaries below Bradbury Dam; and
- 4) Consideration of modification to the schedule of releases from Bradbury Dam to downstream users so that the water benefits fish and wildlife.

(NOAA-11, p. 7.)

¹⁸ Anadromous fish migrate from saltwater to spawn in fresh water.

3.4 California Endangered Species Act

CESA establishes requirements and protections regarding species listed as threatened or endangered under State law. (Fish & Game Code, §§ 2050-2068.) Fish and Game Code section 2055 governs the exercise of authority by state agencies in actions involving threatened or endangered species:

The Legislature further finds and declares that it is the policy of this state that all state agencies, boards, and commissions shall seek to conserve endangered species and threatened species and shall utilize their authority in furtherance of the purposes of [CESA].

Table A shows the bird and amphibian species present in the Cachuma Project area listed as threatened or endangered under CESA. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, pp. 2-51 to 2-52, Table 2-13.)

Table A – CESA Listed Threatened and Endangered Bird and Amphibian Species Present in the Cachuma Project Area

Species	Threatened	Endangered
Bald Eagle <i>Haliaeetus leucocephalus</i>		X
Belding’s savannah sparrow <i>Passerculus sandwichensis beldingii</i>		X
California least tern <i>Sternula antillarum browni</i>		X
California tiger salamander – Santa Barbara County Distinct Population Segment <i>Ambystoma californiense</i>	X	
Foothill Yellow-Legged Frog¹⁹ <i>Rana boylei</i>	X	
Least Bell’s vireo <i>Vireo bellii arizonae</i>		X
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>		X
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>		X

¹⁹ The State Water Board takes official notice of Cal. Reg. Notice Register 2017, No. 27-Z, p. 986 wherein notice is given that pursuant to the provisions of section 2074.2 of the Fish and Game Code, the California Fish and Game Commission (Commission), at its June 21, 2017, meeting in Smith River, California, accepted for consideration the petition submitted to list foothill yellow-legged frog as a threatened species. Pursuant to subdivision (e)(2) of section 2074.2 of the Fish and Game Code, the

3.5 Federal Endangered Species Act

The purposes of the federal Endangered Species Act (ESA) (16 U.S.C. §§ 1531-1544) are to conserve endangered and threatened species and their habitat and to achieve the purposes of certain treaties and conventions. (16 U.S.C. § 1531(b).) The USFWS and NMFS share responsibility for implementing the ESA. The ESA charges NMFS with protection of marine species, including steelhead.

3.5.1 Sections 4 and 9 of the ESA

Section 4 of the ESA (16 U.S.C. § 1533) provides for the listing of endangered or threatened species and the designation of critical habitat. The ESA defines an endangered species as any species that is in danger of extinction throughout all or a significant portion of its range. (*Id.*, § 1532(6).) Critical habitat is defined as:

- 1) Specific areas within the geographical area occupied by the species at the time of listing that contain physical or biological features that are essential to the conservation of the species and that may require special management considerations or protection; and
- 2) Specific areas outside the geographical area occupied by the species at the time of listing that are essential for the conservation of the species.

(*Id.*, § 1532(5)(A).)

Section 4 of the ESA also provides for the development and implementation of recovery plans for the conservation and survival of endangered and threatened species. (*Id.*, § 1533(f).)

With certain exceptions, section 9 of the ESA (16 U.S.C. § 1538) prohibits the take of endangered species. As authorized by the ESA, USFWS and NMFS have by regulation extended the prohibition against the take of endangered species to most threatened species. (See 50 C.F.R., chapter I, subchapter B, part 17 and chapter II, subchapter C,

Commission determined that the amount of information contained in the petition, when considered in light of the Department of Fish and Wildlife's written report, the comments received, and the remainder of the administrative record, would lead a reasonable person to conclude there is a substantial possibility the requested listing could occur. Based on that finding and the acceptance of the petition, the Commission also provided notice that the foothill yellow-legged frog is a candidate species as defined by section 2068 of the Fish and Game Code.

part 223.) “The term ‘take’ means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect...” (16 U.S.C. § 1532(19).) The term “harm” means an act that kills or injures fish or wildlife, including significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. (50 C.F.R. §§ 17.3, 222.102.) NMFS has interpreted this law to mean that, “because steelhead are a highly migratory fish that migrate between feeding, sheltering, and breeding areas, impediments to their migration disrupt and in some cases can prevent the successful completion of their life cycle, leading to the reduction and possible extirpation of individual populations, and potentially of the entire species.” (NMFS, December 8, 2016 comment letter, Attachment A, p. 5.)

3.5.2 Section 7 of the ESA

Section 7 of the ESA (16 U.S.C. § 1536) directs federal agencies to ensure, in consultation with USFWS or NMFS, that any action that they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. USFWS and NMFS have promulgated regulations that govern the section 7 consultation process. The regulations define the phrase “jeopardize the continued existence of” to mean “engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.” (50 C.F.R. § 402.02.)

In most cases, a biological opinion issued by USFWS or NMFS documents the consultation process. (50 C.F.R. § 402.14(a) & (g)(4).) If USFWS or NMFS determines that a federal action is likely to result in jeopardy, then the biological opinion must include any reasonable and prudent alternatives to the proposed action that will avoid jeopardy. (16 U.S.C. § 1536(b)(3)(A).) If USFWS or NMFS determines that a federal action is not likely to result in jeopardy, but the action may result in the incidental take of a listed species, then the biological opinion must include an incidental take statement. (*Id.*, § 1536(b)(4).) The incidental take statement must:

- 1) Specify the impact of the incidental taking on the species;
- 2) Specify reasonable and prudent measures necessary or appropriate to minimize the impact; and
- 3) Set forth terms and conditions that the federal agency must comply with to implement the reasonable and prudent measures.

(*Ibid.*)

Section 9 of the ESA allows any taking that complies with the terms and conditions specified in the incidental take statement. (*Id.*, § 1536(o)(2).) In addition to mandatory terms and conditions, a biological opinion may include advisory conservation recommendations. (50 C.F.R. § 402.14(j).)

A federal agency that has consulted with USFWS or NMFS and obtained a biological opinion must reinitiate consultation if:

- 1) The amount or extent of incidental take specified in the biological opinion is exceeded;
- 2) New information reveals that the action will affect listed species or critical habitat in a manner not previously considered;
- 3) Modifications to the action will affect listed species or critical habitat in a manner that was not previously considered; or
- 4) A new species is listed or critical habitat designated that may be affected by the action.

(50 C.F.R. § 402.16.)

3.5.3 Listing of the Southern California Steelhead Evolutionarily Significant Unit

In 1997, NMFS listed the Southern California steelhead Evolutionarily Significant Unit (ESU), which includes steelhead in the Santa Ynez River, as endangered under the federal ESA. (62 Fed. Reg. 43937 (Aug. 18, 1997).)²⁰ NMFS modified the original listing in 2002 with the extension of the geographic range of the listed species south from the

²⁰ NMFS provided evidence that the present estimated total run size for six streams—Santa Ynez River, Gaviota Creek, Ventura River, Matilija Creek, Santa Clara River, Malibu Creek—in the Southern California ESU are each less than 200 adults. (NOAA-6, p. 1.)

Santa Monica Mountains to the United States-Mexico border. (See 67 Fed. Reg. 21586 et seq. (May 1, 2002.)) NMFS has identified extensive habitat loss due to water development, land use practices, and urbanization as one of the primary reasons for the decline of the species. (*Id.* p. 43942; FEIR, Vol. III, Appendix D, p. 18.) On February 16, 2000, after considering public comments and reviewing additional scientific information, NMFS designated the lower Santa Ynez River as critical steelhead habitat. Critical habitat includes all waters and substrates below naturally impassable barriers and several dams that block steelhead from using historical habitat areas. (FEIR, Vol. III, Appendix D, p. 16.)

3.5.4 Section 7 Consultation for the Cachuma Project – Biological Assessment

After the Southern California steelhead ESU was listed as endangered, Reclamation requested consultation with NMFS concerning the proposed operation of the Cachuma Project pursuant to section 7 of the ESA. In support of its request, Reclamation prepared the “Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River, April 7, 1999” (1999 Biological Assessment), which proposed various modifications to Cachuma Project operations and conservation measures to improve the availability and quality of habitat for steelhead below Bradbury Dam. (DOI-12.)²¹ The major elements of the 1999 Biological Assessment included:

Surcharging

The 1999 Biological Assessment proposed to increase the storage capacity in Lake Cachuma by surcharging the reservoir. Surcharging is accomplished by adding flashboards to the reservoir, thereby allowing additional water to be stored for downstream environmental purposes in the dry, summer months. Pursuant to the 2000 Revised Biological Assessment, the surcharge water is allocated into three accounts: Fish Reserve²², Fish Passage, and Adaptive Management Accounts (discussed below).

²¹ On June 13, 2000, Reclamation issued *Revised Section 3 (Proposed Project) of the 1999 Biological Assessment for Cachuma Project Operations and The Lower Santa Ynez River* (2000 Revised Biological Assessment). (DOI-13.)

²² The Fish Reserve Account was effectively superseded by the Biological Opinion. Instead, “surcharging” the reservoir in spill years provides about 9200 af of water, which is wholly dedicated to the downstream fishery, with 3200 af reserved for passage supplementation, 500 af reserved for adaptive

(FEIR Vol. III, Appendix C, 2000 Revised Biological Assessment, pp. 3-09 to 3-18, 3-24 to 3-31.) In 2005, Reclamation installed the flashboards necessary to implement the 3.0-foot surcharge, which allows additional water to be stored in the reservoir for the three accounts when there is sufficient reservoir inflow.²³

Rearing flow releases

The 1999 Biological Assessment proposed to establish interim mainstem rearing target flows at Highway 154 (3.2 miles below Bradbury Dam) and long-term mainstem rearing target flows²⁴ at Highway 154 and Alisal Bridge (10.5 miles below Bradbury Dam). The interim flows would be implemented when a surcharge of 0.75 and 1.8 foot were reached and the long-term flows would be implemented when a surcharge of 3.0 feet was reached. The interim flows are no longer proposed²⁵ because Reclamation has implemented a 3.0-foot surcharge.

The mainstem rearing flows are set forth in Table 1 below. The amount and location of the rearing flows depend on the amount of reservoir storage and spill. More water is required for rearing in years of higher flows when the mouth of the estuary opens and steelhead are able to migrate up the mainstem. In years of lower flows when the mouth may not open and migration up the mainstem may not be possible, flows are required to support fish holding over from previous years. By having variable mainstem rearing flows,

management actions, and the balance to meet target rearing flows, flow rates for which were established under various hydrological conditions. The target flows must be met regardless, so when the surcharge water is depleted, target flows are provided from project yield. (FEIR, Vol. II, p. 2.0-17.)

²³ Surcharge is a term used to describe the amount of water stored above the elevation 750 feet in Cachuma Reservoir. Bradbury Dam's spillway crest is at elevation 720 feet. Four 30-foot by 50-foot radial gates, with a concrete lined chute and stilling basin, control the spillway. The gate opening is 30 vertical feet. When closed, the top of the gates is at elevation 753 feet with a flashboard for a 3.0-foot surcharge. In 2009, Reclamation was able to implement a 3.0-foot surcharge. The 3.0-foot surcharge increased the reservoir capacity by only 8,942 af, due to sedimentation (total capacity of 195,578 af). (FEIR, Vol. II, pp. 2.0-1, 4.2-5, 4.7-23 to 4.7-24.)

²⁴ The term "Target Flows," used in the 1999 Biological Assessment, Biological Opinion, and the FEIR, is not used further in this order to make clear that the long-term mainstem flows described in the order are requirements that shall be met, not simply targets.

²⁵ The interim mainstem rearing flows have been replaced by the long-term mainstem rearing flows. As a result, there is no longer a need to differentiate between the different flow regimes. The long-term mainstem rearing flows are subsequently referred to in this order simply as "mainstem rearing flows."

more water is available when it will support the most steelhead. (FEIR, Vol. III, Appendix C, 2000 Revised Biological Assessment, p. 3-11.)

There are several challenges with the measuring station for Highway 154: the station is on private land and access to the station has been denied by the landowner, there are no suitable measuring locations within the bridge easement, and there is a depositional area upstream of the Highway 154 bridge that affects surface flows. (R.T., October 22, 2003, p. 301:12–301:22.) According to Ms. Jean Baldrige, a fisheries biologist and witness for the Member Units, there is no way to measure or verify flows, however, the Bureau is over releasing water to ensure there is sufficient water in that reach. (*Id.*, p. 395:11.) In light of the requirement to accurately measure the 2000 Biological Opinion flows, this order requires Reclamation to use a gauge or other methodology satisfactory to CDFW and NMFS and approved by the Deputy Director to maintain a continuous record of the daily instream flows in the Santa Ynez River at Highway 154.

**Table 1 Flows
Mainstem Rearing Flows**

Reservoir Spill ^a (af)	Lake Storage ^b (af)	Flow (cfs) Requirements at:		
		<i>Highway 154</i>	<i>Alisal Road</i>	<i>Stilling Basin & Long Pool</i>
≥ 20,000	NA	10	1.5 ^c	-
< 20,000	≥ 120,000	5	1.5 ^d	-
	≥ 30,000 and < 120,000	2.5	1.5 ^d	-
	< 30,000	-	-	30 af/mo ^e

NA - not applicable

^a Reservoir spill is calculated cumulatively over the course of the water year (FEIR, Vol. IV, Appendix F, Draft Technical Memorandum No. 5, p. 6), which begins October 1 (FEIR, Vol. IV, Appendix F, Draft Technical Memorandum No. 5, p. 8).

^b Lake storage is measured on the first day of each month. (FEIR, Vol. IV, Appendix E, Technical Memorandum No. 1, p. 5.)

^c The specified flow applies only when *Oncorhynchus mykiss* are present.

^d The specified flow applies only if there was reservoir spill greater than or equal to 20,000 af in the prior water year and *Oncorhynchus mykiss* are present in the Alisal Reach.

^e When there is less than 30,000 af of total water stored in the reservoir, regardless of origin, Reclamation shall provide periodic releases of 30 af per month to refresh the Stilling Basin and Long Pool directly downstream of the dam to provide for *Oncorhynchus mykiss* rearing in these areas. Less than 30 af per month may be released upon determination by the fishery agencies and the State Water Board that less water is necessary to refresh the Stilling Basin and Long Pool directly downstream of the dam for *Oncorhynchus mykiss* in these areas.

Fish passage supplementation

The 1999 Biological Assessment proposed to create a Fish Passage Account for the purpose of supplementing passage flows to increase the number of days that migration would be possible in the mainstem of the river for steelhead to reach tributaries near Bradbury Dam. The Fish Passage Account would be filled in years when the reservoir surcharges and released in subsequent years to enhance passage opportunities by augmenting the storm hydrographs. Reclamation proposed to dedicate up to 3,200 af of water to the Fish Passage Account.

Adaptive management account (AMA)

The 1999 Biological Assessment proposed to establish an AMA to be used when small amounts of additional water could create benefits to steelhead and their habitat. When the reservoir surcharges to the 3.0-foot level, 500 af of the water would be dedicated to the AMA. The AMA would be used at the discretion of an Adaptive Management

Committee to increase releases for mainstem rearing, provide additional water for passage flow supplementation, or provide additional flows to Hilton Creek, a tributary that intersects the Santa Ynez River immediately below Bradbury Dam. (See Appendix 1, Figure 2.)

Ramping rates

The 1999 Biological Assessment proposed to establish a schedule for ramping releases to eliminate possible stranding of steelhead or rainbow trout as Bradbury Dam releases are returned to the rearing flows at Highway 154 at the completion of releases to satisfy downstream water rights.

Habitat improvement projects

The 1999 Biological Assessment determined habitat conditions are suitable (e.g., perennial flow, acceptable water temperature, etc.) for steelhead spawning and/or rearing within several tributaries to the lower Santa Ynez River including Salsipuedes and El Jaro creeks. The 1999 Biological Assessment proposed to implement a number of habitat improvement projects, including removal of 11 passage impediments along the following tributaries: Hilton Creek (one on federal land and one under Highway 154); Salsipuedes Creek (Highway 1 bridge); Quiota Creek (six road crossings); El Jaro Creek (one road crossing); and Nojoqui Creek (one road crossing). Section 5.3.3.1.3 discusses the status of the Habitat Improvement Projects.

The 1999 Biological Assessment also proposed a monitoring program, which the Santa Ynez Technical Advisory Committee (SYRTAC) developed.²⁶ The monitoring program included monitoring of Order WR 89-18 releases, water quality, tributary enhancement

²⁶ SYRTAC was composed of CDFW; NMFS; Reclamation; U.S. Forest Service; Natural Resource Conservation Service; CalTrout; Santa Barbara Urban Creeks Council; Central Coast Regional Water Quality Control Board; CCWA; Santa Barbara County Fish and Game Commission; California Coastal Commission; USFWS; CCRB; SYRWCD; SYRWCD, ID No. 1; SBCWA; and the City of Lompoc. (FEIR, Vol. II, p. 2.0-16.) The SYRTAC remained active until the Biological Opinion and the Fish Management Plan established the Adaptive Management Committee in 2000. The Adaptive Management Committee effectively replaced the SYRTAC. (*Id.*, p. 2.0-17.)

projects, and flow compliance as well as fish surveys. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, pp. 3-51 to 3-61.)

3.5.5 2000 Biological Opinion for the Cachuma Project

Reclamation completed consultation with NMFS under section 7 of the ESA in September 2000, when NMFS issued a Biological Opinion. In the 2000 Biological Opinion, NMFS evaluated the effect of the ongoing operation and maintenance of the Cachuma Project, including the changes in operations and conservation measures proposed by Reclamation in the 1999 Biological Assessment for the benefit of the steelhead population on the lower Santa Ynez River. (FEIR, Vol. II, p. 2.0-18.) NMFS determined that the operation of the project as proposed, together with implementation of the proposed conservation measures, would not jeopardize the continued existence of steelhead or destroy or adversely modify critical habitat. The 2000 Biological Opinion contains 15 reasonable and prudent measures to minimize incidental take of steelhead, and mandatory terms and conditions required to implement the reasonable and prudent measures. In essence, the 2000 Biological Opinion requires implementation of most of the operational changes and conservation measures described in the 1999 Biological Assessment above, along with additional operational, reporting, and monitoring requirements for steelhead. One of the reasonable and prudent measures contained in the 2000 Biological Opinion is the requirement that Reclamation reinitiate consultation if the tributary passage impediment and barrier fixes that Reclamation had proposed to implement were not completed by 2005.

In 2005, NMFS revisited critical habitat designations and confirmed that the critical habitat for steelhead in the Santa Ynez River extends upstream from the lagoon, which is located within Vandenberg Air Force Base, to Bradbury Dam, including the main tributaries. (50 C.F.R. § 226.211(j)(2)(i-iv).) In 2006, the District Population Segment (DPS) policy, an alternative approach of delineating species under the ESA, superseded the policy of using Evolutionarily Significant Units to delineate species of steelhead.²⁷ (71 Fed. Reg. 834 (Jan. 5, 2006).) This policy recognizes that within discrete steelhead populations,

²⁷ In the remainder of this order, DPS will be used for any references to ESU.

resident and anadromous life forms remain “markedly different” from other populations because of physical, physiological, ecological, and behavioral factors. The Santa Ynez River steelhead population is part of the Southern California DPS.²⁸ Using these criteria, all naturally spawned steelhead that originated in freshwater habitat below impassible barriers and which exhibit an anadromous life history are considered part of the DPS. Individuals originating in freshwater above impassible barriers that exhibit an anadromous life history are also considered part of the DPS when they are within waters below the barriers. (FEIR, Vol. II, p. 2.0-19.)

3.5.6 Reinitiation of ESA Section 7 Consultation for the Cachuma Project

In December 2005, Reclamation submitted a request to NMFS to reinitiate consultation as required by the 2000 Biological Opinion. Mr. Darren Brumback, a NMFS fisheries biologist, testified on the reasons reinitiation of consultation under the ESA was required for the Cachuma Project. First, Reclamation exceeded the amount of incidental take specified in the 2000 Biological Opinion for the annual monitoring program (i.e. trapping).²⁹ Second, Reclamation failed to meet rearing flows at Alisal Bridge in 2007, which resulted in unauthorized take. Third, Reclamation did not complete all restoration actions by 2005 as required by the 2000 Biological Opinion. As described in sections 3.5.4 and 3.5.5, the 2000 Biological Opinion required Reclamation to complete 11 tributary improvement projects by 2005. The anticipated completion date of a revised biological opinion was unknown at the time of the hearing. (R.T., March 29, 2012, p. 232:10-232:12.)

According to NMFS’s December 8, 2016 and May 28, 2019 comment letters on the draft order, Reclamation’s 1999 Biological Assessment has been superseded by the 2013 Biological Assessment with amendments. NMFS states that the new Biological

²⁸ The Southern California Steelhead DPS encompasses all naturally spawned anadromous steelhead between the Santa Maria River and the U.S.-Mexico border.

²⁹The 2000 Biological Opinion contains two categories of numerical take associated with the monitoring program: 1) capture/handling and 2) trapping mortalities. The 2000 Biological Opinion allows the monitoring program to result in the capture and release of 110 juveniles and 150 adults with the unintentional mortality of 4 juveniles and 1 adult due to trapping. (FEIR, Vol. III, Appendix D, p. 66.) Ms. Baldrige, a witness for the Member Units, presented evidence that the take exceedances for the years 2001 – 2011 were: 2317 juveniles and 1 adult during capture/handling, and 0 juveniles and 3 adults lost as trapping mortalities. (MU-290, p. 6.)

Assessment differs substantially from the 1999 Biological Assessment. (NMFS, December 8, 2016 comment letter, Attachment A, p. 6; NMFS, May 28, 2019 comment letter, Attachment, p. 4.) NMFS' May 28, 2019 comment letter also states that re-initiation of consultation with Reclamation occurred in 2016 which resulted in a draft biological opinion dated November 28, 2016. (NMFS, May 28, 2019 comment letter, Attachment, p. 15.) However, according to NMFS, Reclamation terminated the formal consultation that is the basis of the November 28, 2016, draft biological opinion. (NMFS, May 28, 2019 comment letter p. 2.) NMFS' May 28, 2019 letter, indicates that a future formal consultation with Reclamation on a revised proposed action for the Cachuma Project is anticipated but the specific timing for that future consultation is unknown. (*Ibid.*) Neither the 2013 Biological Assessment nor the November 28, 2016 draft biological opinion are part of the administrative record but could be used as sources of information to inform submittals required by this order.

3.5.7 Southern California Steelhead Recovery Plan

Section 4(f) of the ESA directs NMFS to develop and implement recovery plans for the conservation and survival of listed threatened and endangered species, including the southern California steelhead. Recovery plans must, to the maximum extent practicable, incorporate:

- 1) Site-specific management actions necessary to achieve the goals of the recovery plans for the conservation and survival of the species;
- 2) Objective, measurable criteria for the recovery of species that would allow determinations that the species were recovered and therefore eligible for removal from the list of endangered or threatened species; and
- 3) Estimates of the time and costs required to carry out measures needed to achieve the plans' goals, as well as intermediate steps toward those goals.

To meet this requirement, NMFS convened a Technical Recovery Team in 2001 that produced a series of scientifically peer reviewed Technical Memoranda that formed the basis of the Southern California Steelhead Recovery Plan. (NMFS Dec. 8, 2016 comment letter, pp. 5-6.) In July 2009, NMFS released the Draft Southern California Steelhead Recovery Plan and adopted the Final Southern California Steelhead Recovery Plan in 2012. (FEIR, Vol. II, 2.0-42; NMFS Dec. 8, 2016 comment letter, p. 1.) This Recovery

Plan identifies watershed specific threats and recovery actions, including those for the Santa Ynez River watershed, as well as population and DPS-wide viability criteria. (NMFS December 8, 2016 comment letter, pp. 5-6.)³⁰ The Final Southern California Steelhead Recovery Plan is not part of the administrative record but is a source of information that could be used to inform submittals required by this order.

4.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT COMPLIANCE

The California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) (CEQA) applies to discretionary projects public agencies propose to carry out, fund, or approve, unless an exemption applies. (Pub. Resources Code, § 21080.) The purposes of CEQA are to:

- 1) Inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities;
- 2) Identify ways that environmental damage can be avoided or significantly reduced;
- 3) Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and
- 4) Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

(Cal. Code Regs., tit. 14, § 15002, subd. (a)(1-4).)

³⁰ NMFS's 2009 Draft and 2012 Final Southern California Steelhead Recovery Plans are not in the administrative record. On November 13, 2003, after accepting testimony and evidence for Phase 2 of the hearing into the record, the hearing officer left the hearing record open pending the submittal of the FEIR. Two additional hearing days were held on March 29 and 30, 2012, to determine whether the FEIR should be entered into the administrative record. In a March 14, 2012 letter, the hearing officer ruled "in accordance with the limited scope of the upcoming hearing, NMFS will not be permitted to present testimony on... the steelhead recovery planning process, or the contents of the steelhead recovery plan, unless NMFS can demonstrate that the testimony bears directly on the validity of a specific factual statement, analysis, or determination contained in the FEIR." NMFS did not attempt to demonstrate to the State Water Board how testimony related to the steelhead recovery plan bears directly on the FEIR. Subsequently, NMFS's Final Southern California Steelhead Recovery Plan (Exhibit CT-130) was not admitted into evidence by the hearing officer. (See generally R.T., March 29, 2012, pp. 236:1 to 238:16.)

An environmental impact report (EIR) must be prepared if a project is not exempt and there is substantial evidence that the project may have a significant effect on the environment. (Pub. Resources Code, § 21080, subd. (d).) If there is not substantial evidence that the project may have a significant effect on the environment, a negative declaration must be prepared. (*Id.*, § 21080, subd. (c).) In situations where more than one public agency will carry out or approve a project, the agency with principal responsibility for carrying out or approving the project serves as the lead agency, and is responsible for preparing the EIR or negative declaration. (Cal. Code Regs., tit. 14, § 15050, subd. (a).)

4.1 Environmental Impact Report Prepared for the Proposed Project

As CEQA lead agency, the State Water Board prepared an EIR in connection with the Board's consideration of modifications to Reclamation's Permits for the Cachuma Project in order to protect public trust resources and downstream water rights. The Board issued a Draft EIR for public review and comment on August 8, 2003. The Board issued a Revised Draft EIR on July 31, 2007 (2007 RDEIR), and a Second Revised Draft EIR on April 1, 2011. The Board issued a FEIR in December 2011. The FEIR is comprised of seven volumes. Volume I consists of responses to public comments received on the three draft EIR's. Volume II is an edited version of the 2011 Second Revised Draft EIR. Volumes III and IV contain the appendices to the Second Revised Draft EIR. Finally, Volumes V, VI, and VII consist of the 2003 Draft EIR, the 2007 RDEIR, and the 2011 Second Revised Draft EIR, respectively.

The proposed project analyzed in the EIR is described in general terms as potential modifications to Reclamation's Permits for the Cachuma Project in order to provide appropriate protection of public trust resources and downstream water rights of the Santa Ynez River. The purpose of the EIR was to support the State Water Board's decision whether and how to modify Reclamation's Permits after holding an evidentiary hearing. It was not possible to describe the proposed project in greater detail, and specify whether and how Reclamation's Permits would be modified, without prejudging the outcome of the hearing. Instead, the EIR evaluated a range of alternatives consistent with the range of possible modifications to the Permits that were under consideration.

The FEIR evaluated the potential environmental impacts of the No Project Alternative and five additional alternatives: 3B, 3C, 4B, 5B, and 5C. Section 3.2.2 of the Final EIR contains a detailed description of the alternatives. In summary, Alternatives 3B, 3C, and 4B assume that the Board modifies Reclamation’s Permits for the Cachuma Project to require releases from Bradbury Dam for purposes of protecting fishery resources in accordance with the 2000 Biological Opinion. Alternatives 5B and 5C also assume compliance with the 2000 Biological Opinion flows in all years except wet and above normal year types. In wet and above normal year types, Alternatives 5B and 5C include higher instream flow requirements proposed by CalTrout, also known as Alternative 3A2.³¹ These flows are set forth in Table 2, below, and this order, hereafter, refers to these flows as Table 2 Flows.

Table 2 Flows³²

Minimum Flow Requirement*	Period of Release	Purpose of Release
48 cfs	02/15 to 04/14	Spawning
20 cfs	04/15 to 06/01	Incubation and Rearing
25 cfs	06/02 to 06/09	Emigration
Ramp to 10 cfs by 06/30		
10 cfs	06/30 to 10/01	Rearing and Resident Fish Maintenance
5 cfs	10/01 to 02/15	Resident Fish

*The flows in the table above would be required to be maintained at both San Lucas and Alisal bridges.

Alternatives 3B and 5B assume that Reclamation surcharges Cachuma Reservoir by 1.8 feet, whereas Alternatives 3C, 4B and 5C, assume that Reclamation surcharges the reservoir by 3.0 feet. Since the time when the alternatives were developed, Reclamation has implemented a 3.0-foot surcharge, essentially rendering Alternatives 3B and 5B obsolete.

³¹ Alternative 3A2 was one of the alternatives evaluated in a 1995 Environmental Impact Report/Environmental Impact Statement (EIS/EIR) prepared by Reclamation and Cachuma Project water supply contractors in connection with the renewal of the water supply contract for the Cachuma Project. (SWRCB-5, pp. 4-32 to 4-33.)

³² See FEIR, Vol. II, pp. 3.0-19 to 3.0-20.

Under all of the alternatives, releases to satisfy downstream water rights would be made in accordance with State Water Board Order WR 89-18, except that the release requirements would be modified under Alternatives 3C and 4B. Under Alternative 3C, the Board would modify release requirements in accordance with the Settlement Agreement. Under Alternative 4B, releases from Bradbury Dam to recharge the Lompoc Plain Groundwater Basin would be exchanged for SWP water discharged into the Santa Ynez River in the vicinity of the Lompoc Forebay.³³ The City of Lompoc has taken the position that Alternative 4B is infeasible because city residents have rejected SWP water as a new water supply.

The environmental analysis evaluated the potential environmental impacts of the alternatives using Alternative 2 as the baseline. Alternative 2 represents the environmental conditions that existed in September 2000, a relatively short time after the State Water Board began its environmental review of the proposed project. Alternative 2 remains an appropriate environmental baseline, even though Reclamation has implemented a number of operational and other changes since 2000, including the 3.0-foot surcharge, to comply with the 2000 Biological Opinion. Normally, the environmental conditions that exist at the time a lead agency issues a notice of preparation of an EIR constitute baseline conditions for purposes of the impacts analysis, even if conditions change during the environmental review process. (Cal. Code Regs., tit. 14, § 15125, subd. (a).) In addition, the use of Alternative 2 as the baseline, as opposed to existing conditions, resulted in a conservative estimate of the potential environmental impacts of the alternatives. For example, Alternative 2 assumes a 0.75-foot surcharge. Accordingly, comparing the other alternatives, which assume either a 1.8- or 3.0-foot surcharge, to Alternative 2 results in the full disclosure of the potential environmental impacts of surcharging Cachuma Lake from 0.75 to 3.0 feet, even though some of those impacts already have occurred. By contrast, if the analysis used current conditions as the baseline, including a 3.0-foot surcharge, the impacts associated with

³³ Recharge from the Santa Ynez River occurs primarily from the Narrows to H Street Bridge (called the Lompoc Forebay). (FEIR, Vol. V, p. 4-63.)

increasing the surcharge from 0.75-foot to 3.0 feet would not be disclosed. (FEIR, Vol. II, pp. 3.0-13 to 3.0-14.)

4.2 Negative Declaration Prepared for Change Petition

The Member Units prepared a Negative Declaration for the petition to add 17,506 acres to the permitted place of use and to consolidate the purposes of use for the Cachuma Project. (Staff Exhibit 3.) The Negative Declaration reflects the fact that the majority of the land annexations described in the petition occurred prior to the effective date of CEQA. The document analyzes whether all of the Cachuma Project water could have been utilized in the permitted place of use, and concludes that all of the project water could have been used in the authorized place of use. The Negative Declaration does not identify mitigation measures. COMB adopted the Negative Declaration on November 2, 1998, and filed a Notice of Determination with the State Clearing House. (*Ibid.*)

5.0 PROTECTION OF PUBLIC TRUST RESOURCES

One of the primary objectives of this proceeding is to ensure the protection of public trust resources upstream and downstream of Bradbury Dam, including but not limited to fishery resources in the Santa Ynez River. Public interest considerations for this project include, but are not limited to:

- 1) The water supply impacts of measures designed to protect public trust resources, and
- 2) The extent to which any water supply impacts can be minimized through the implementation of water conservation measures.

(FEIR, Vol. II, p. ES-2.)

Sections 5.1 through 5.3 consider the impacts of the Cachuma Project on sensitive plant species and lakeshore vegetation, aquatic (non-fishery) and terrestrial wildlife, and fishery resources.

5.1 Evaluation of Sensitive Plant Species and Lakeshore Vegetation

Six sensitive plant species have historically been known to occur in the vicinity of Cachuma Reservoir or along the river below Bradbury Dam. (FEIR, Vol. II, pp. 4.8-8 to 4.8-9.) Sensitive species consist of state and federally listed, proposed, and candidate plants; state “species of special concern” identified by CDFW; and species considered rare and endangered by the California Native Plant Society. There was no testimony at the Cachuma hearing regarding these plant species.

None of the six sensitive plant species presently occur at the margins of Cachuma Reservoir or in the lower Santa Ynez River between Bradbury Dam and the ocean; the plant species either have been extirpated or occur in the dunes away from the effects of the river. (FEIR, Vol. II, pp. 4.8-8 to 4.8-9, 4.8-16.) Accordingly, this order does not address measures for the protection of these species.

5.2 Evaluation of Aquatic (Non-Fish) and Terrestrial Wildlife Resources

Riparian habitat along the lower Santa Ynez River supports a great diversity of aquatic and terrestrial wildlife species. Streams and pools provide habitat for aquatic and semi-aquatic species such as Pacific chorus frog, western toad, Pacific tree frog, and the introduced bullfrog. In addition to these common species, various sensitive aquatic and wildlife species occur along the lower Santa Ynez River from Bradbury Dam to the ocean, and at Cachuma Reservoir. Sensitive species include those listed as threatened or endangered under CESA or the federal ESA, or designated as a “species of special concern” by CDFW. (FEIR, Vol. II, p. 4.9-1.) The California red-legged frog (*Rana draytonii*), a federally listed threatened species, has occurred in the past along the Santa Ynez River and in its tributaries. (*Id.*, p. 4.9-2.) Much of the Santa Ynez River above Alisal Road becomes dry by summer, and is, therefore, unlikely to support red-legged frogs due to lack of permanent water. (*Ibid.*) Downstream from Buellton, predators such as bullfrogs limit the frog’s use of available habitat. (*Ibid.*) When USFWS designated critical habitat for this species in 2001, the lower Santa Ynez River and any lower tributaries were not included. (*Id.*, pp. 4.9-2 to 4.9-3.)

Common reptiles and amphibians include the ensatina, western fence lizard, common kingsnake, gopher snake, and common garter snake. Small mammals use the riparian vegetation for cover, movement corridors, and foraging. At the hearing, no evidence or testimony was received regarding the Cachuma Project's impact on the special status terrestrial species as a result of the construction of Bradbury Dam. Accordingly, these species are not discussed further in this order.

5.3 Evaluation of Fishery Resources

Twenty-six species of fish inhabit the Santa Ynez River watershed, including 11 native species. All native species reported in the 1940's are still present. Steelhead/rainbow trout, prickly sculpin, partially armored threespine stickleback, and Pacific lamprey are native to the Santa Ynez River. Seven additional native species are found only in the lagoon: tidewater goby, Pacific herring, topsmelt, shiner perch, starry flounder, staghorn sculpin, and striped mullet. Fifteen fish species have been introduced to the watershed, including the arroyo chub, non-native large- and smallmouth bass, sunfishes, and catfish. (FEIR, Vol. II, p. 4.7-1.)

5.3.1 Endangered Species or Species of Concern

Two federally listed endangered fish species are found in the Santa Ynez River watershed and one California species of concern:

- Arroyo chub (*Gila orcutti*) – California species of concern;
- Tidewater goby (*Eucyclogobius newberryi*) – Federally-listed endangered species; and
- Southern California DPS of steelhead trout (*O. mykiss*) – Federally-listed endangered species.

5.3.1.1 Arroyo Chub

The arroyo chub is a relatively small, chunky minnow, typically less than 5 inches in length. Arroyo chub are native to the Los Angeles, San Gabriel, San Luis Rey, Santa Margarita, and Santa Ana River systems, as well as San Juan Creek. Arroyo chub were introduced into the Santa Ynez River drainage during the early 1930s and are currently found throughout the Santa Ynez River Watershed. (FEIR, Vol. II, p. 4.7-6.) The EIR

states that arroyo chub are adapted to surviving common climatic conditions on the Santa Ynez River such as periodic high flows and widely fluctuating water temperature and oxygen levels with observations at oxygen levels as low as 1.6 parts per million (ppm). (FEIR, Vol. II, p. 4.7-5.) Arroyo chub prefer slow-moving sections of rivers with a sand or mud substrate, or standing waters in reservoirs. In 1993, SYRTAC found arroyo chub along the river below Bradbury Dam in abundant numbers in shallow pools. However, they were not observed in pools inhabited by large predators (bass and sunfish), and they were relatively scarce in riffle and run habitats. (FEIR, Vol. II, pp. 4.7-5 to 4.7-6.)

No testimony was received during the Cachuma Project hearing related to the arroyo chub. Based on the lack of information in the hearing record on any needed measures to protect the arroyo chub, this order does not include any such requirements. However, measures included to protect steelhead are expected to benefit the arroyo chub. (FEIR, Vol. II, pp. 4.7-51 to 4.7-53.)

5.3.1.2 Tidewater Goby

The tidewater goby is a small estuarine fish, rarely exceeding 2 inches in length, which inhabits lagoons and the tidally influenced region of rivers from San Diego County to Del Norte County, California. They are typically found in the upper ends of lagoons in brackish water. Tidewater gobies remain common in the Santa Ynez River lagoon, and both young-of-the-year (first year) and adults have been collected. (FEIR, Vol. II, p. 4.7-5.)

No testimony was received during the Cachuma Project hearing related to the tidewater goby. Based on the lack of information in the hearing record on any needed measures to protect the tidewater goby, this order does not include any such requirements. However, measures included to protect steelhead are expected to benefit the tidewater goby. (FEIR, Vol. II, p. 4.7-53.)

5.3.1.3 Southern California Evolutionary Significant Unit of Steelhead Trout

The federal ESA lists the anadromous southern steelhead as endangered and designates the Santa Ynez River downstream of Bradbury Dam and its tributaries as critical habitat for the Southern California DPS species. The Santa Ynez River lagoon is not designated

as critical habitat for either steelhead or the tidewater goby, as it is located within Vandenberg Air Force Base and is therefore exempt.³⁴ (FEIR, Vol. II, p. 4.7-1.)

5.3.1.3.1 Steelhead Lifecycle and Habitat

The species *O. mykiss* includes both rainbow trout and steelhead. Fish that exhibit a non-anadromous resident life history are referred to as rainbow trout and fish that exhibit an anadromous migratory life history are referred to as steelhead. *O. mykiss* that are native to the Santa Ynez River exhibit three life strategies: 1) resident; 2) lagoon anadromous; and 3) fluvial anadromous. (FEIR, Vol. II, p. 4.7-3.) Resident rainbow trout live their entire lives in fresh water. (*Ibid.*) Lagoon anadromous steelhead rear as juveniles in the lagoon of their natal creek. (*Ibid.*) Fluvial anadromous steelhead are born and rear for one to two years as juveniles in freshwater before smolting,³⁵ emigrating to the ocean to grow to maturity, and returning to fresh water to spawn. (*Ibid.*) Populations of *O. mykiss* can exhibit both resident and anadromous life history strategies within the same river system and individuals exhibiting one life history strategy can produce offspring that exhibit the other strategy. (DOI-1f, Vol. 1, p. 2-24.)

Anadromous steelhead exhibit the following lifecycle phases: egg, fry, juvenile, smolt, and adult. (MU-224, pp. 2-3.) The quantity and quality of available physical habitat plays an important role in determining the potential of that habitat to support each phase of the steelhead lifecycle. Physical habitat is defined by parameters such as the amount of space available, water depth, water velocity, substrate, availability of shelter, food resources, and water quality. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, pp. 2-16 to 2-17.)

Differences in water velocity and depth generally characterize the four distinct categories of steelhead physical habitat: riffles, runs, pools, and glides. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-16.) Steelhead use these types of habitat at different lifecycle phases. (*Ibid.*) The habitat types have different potentials for supporting

³⁴ Vandenberg Air Force Base is subject to an Integrated Natural Resources Management Plan prepared under the Sikes' Act and therefore the Base does not have critical habitat designations for ESA-listed species.

³⁵ Smolting is the physiological changes that adapt young steelhead to a life in saltwater. (MU-224, p. 3.)

populations of steelhead because of their differing hydraulic characteristics and because life stages of steelhead vary in their preference for those characteristics. (*Ibid.*) Riffles are high gradient areas with shallow depths, relatively fast water velocities, and turbulent flow patterns. Runs have lower gradients than riffles and are generally deeper. They have relatively uniform water velocities across the channel width, and minimal surface turbulence. Pools have low gradients, low water velocities and are generally deeper than riffles and runs. Glides have uniform channel bottom, low to moderate flow velocities, and little or no turbulent flow. (FEIR, Vol. II, Appendix C, 2000 Revised Biological Assessment, p. 3-60.) Available habitat types associated with different life stages must be linked to support successful completion of the steelhead life cycle. (MU-226, p. 5.) So, connectivity of habitat for key life stages is an important factor in maintaining steelhead populations in good condition. (R.T., November 12, 2003, p. 856:2-856:25.)

Other important habitat characteristics include substrate, instream vegetation, and riparian canopy. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-16.) Substrate can influence the abundance and distribution of steelhead, with different life-stages having different substrate requirements from gravels to boulders. (*Ibid.*) Substrate size influences food production with highest food production zones expected where the river is dominated by cobble. (CT-12, p. 13.) Riparian vegetation can provide cover for smaller steelhead, decrease water temperature by moderating thermal gain from solar radiation, and provide an important source of nutrients in aquatic food chains for steelhead. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-16.) Large woody debris that fall into the stream further increase cover and create areas of scour that increase water depth. (*Id.*, 2000 Revised Biological Assessment, p. 3-46.) Riparian vegetation can also reduce water velocities and create refuge areas of relatively low velocity during storm flows. (*Ibid.*)

Water quality conditions, particularly water temperature and dissolved oxygen concentrations below Bradbury Dam, directly influence the quality and availability of habitat for steelhead. Water temperature is influenced by seasonal air temperature, solar radiation, river shading, instream flow, temperature of water released from Bradbury Dam, water depth and in some areas, groundwater upwelling. Much of the literature regarding

temperature tolerances of steelhead is based on data collected in the Pacific Northwest and/or on resident rainbow trout populations. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-60.) Southern California steelhead are often presumed to be more tolerant of warm water than steelhead from more northerly stocks because they evolved at the southern limit of steelhead distribution in North America. (*Id.*, p. 2-61.)

Temperature tolerances and preferences for steelhead vary among life stages. At temperatures greater than 21.1 degrees Celsius (°C), steelhead have difficulty obtaining sufficient oxygen from the water. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-60.) The preferred temperature range is reportedly 12.8 to 15.6°C. (*Ibid.*) Steelhead metabolic rate increases in warmer waters, resulting in increased energy demands for oxygen and food until the upper, lethal limit is reached. (*Ibid.*) High water temperatures, which reduce oxygen solubility, compound the stress on fish caused by marginal oxygen concentrations. (*Id.*, p. 2-31.)

Dissolved oxygen concentrations are influenced by water turbulence and mixing, instream flows, water temperature, photosynthetic activity during the daytime, and metabolism by algae at night. Extensive aquatic growth may lead to depressed levels of dissolved oxygen during the night or late in the season (late summer through fall) as the algae die and decompose. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, pp. 2-16 to 2-17.) Dissolved oxygen affects steelhead habitat quality and use, physiological stress, and mortality. (*Id.*, p. 2-62.) Optimum dissolved oxygen concentrations for steelhead are 6 to 8 milligrams per liter (mg/l) and greater. Concentrations of 4 mg/l or less have been found to cause severe distress with concentrations below 3mg/l leading to possible mortality. (*Id.*, pp. 2-31 to 2-33.)

Food resources, an important factor in the steelhead lifecycle, can also be affected by habitat characteristics. Temperature extremes, siltation, and loss of riparian vegetation can lead to a reduction in the aquatic food base and overall health and survival. (CT-12, p. 12.) A premature loss of flow during the peak period of spring productivity can also affect insect production and food supplies for fish. (*Ibid.*)

The anadromous steelhead life cycle starts in the winter with the return of mature adults from the ocean. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-53.) In many southern California streams, including the Santa Ynez River, a sandbar that forms across the mouth of the river during the summer blocks access to the river. Upstream migration from the ocean to spawning grounds requires sufficient stream flow to breach the sandbar at the river mouth and to allow passage up the river. In the Santa Ynez River system, anadromous adult steelhead migrate and spawn in the wettest months, generally January through March. (MU-224, p. 2.) The migration seldom begins earlier than December and may extend into May if late storms develop. (FEIR, Vol. II, p. 4.7-3.) In dry years, upstream migration can be impeded by low flows at critical locations (e.g., riffles). (*Ibid.*) Adult steelhead require deep pools as resting areas and refuges from high flows and water temperatures. (CT-12, pp. 13-14.)

After migration, anadromous steelhead spawn in riffles and runs, (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, pp. 4-5; MU-224, p. 3), laying eggs in nests (redd) of gravels from 0.5 to 3-inch in diameter, (MU-224, p. 3). Spawning success, a factor in the production of young-of-the-year steelhead, depends on the quality of spawning conditions and ease of spawning access to suitable spawning habitat. (MU-224, p. 3.) The nests require gravel free of silt and sand for spawning. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-16.) If fine sediments accumulate within or over redds, they can interfere with water exchange and adversely affect eggs and newly-hatched fry (alevins). (*Id.*, p. 2-56.) The eggs and alevins buried in the gravel require a slow but constant flow of water through the gravel to provide dissolved oxygen and carry away metabolic waste products. Eggs also require suitable temperature conditions, with mortality of eggs beginning at 13.3°C. (*Id.*, p. 2-60.)

Steelhead alevins emerge from the gravel five to eight weeks after the eggs have been deposited, between March and May depending on water temperature. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-56.) In water temperatures around 15.6°C, steelhead can emerge from the gravel in as short as three weeks. (*Ibid.*) Steelhead alevins disperse throughout the river, typically occupying shallow low velocity areas along the river margin. (MU-224, p. 2.) Steelhead fry and juveniles feed on a variety of

invertebrates, including aquatic and terrestrial insects, amphipods and snails, and rely on large substrate such as boulders and large cobble to provide important shelter during high winter flows. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, pp. 2-16, 2-56.)

Juveniles typically rear for approximately one or two years. (R.T., October 22, 2003, p. 271:10-271:13.) Unless the river is highly productive, juvenile steelhead require two summers before reaching smolt size. (MU-224, p. 3.) The primary rearing areas for steelhead are pools and runs. (*Ibid.*) Favorable rearing temperatures for juvenile steelhead of northern stocks have been reported between 13 and 19°C. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-60.) Rearing steelhead have been found to function normally at dissolved oxygen concentrations of 7.75 mg/l or above and display symptoms of distress at 5 – 6 mg/l. (MU-226, p. 18.)

After one to two years when juveniles are 5-10 inches long, they undergo physiological changes that adapt them to a life in saltwater, and become “smolts.” Typically, smolts emigrate to the ocean from February through May, but the timing of migration is dependent upon stream flows. (FEIR, Vol. II, p. 4.7-3.) Smolts need sufficient flow and connectivity to migrate downstream to the ocean, and therefore flow is one of the most important considerations in providing for downstream migration. (*Id.*, p. 2.0-25; MU-226, p. 33.) Early closure of lagoons by sandbars due to low river flow may adversely affect out-migration of smolts. (MU-224, p. 3.) In the ocean, smolts will continue to grow into adults before returning to their natal streams to spawn. Unlike most salmonids, steelhead may emigrate back to the ocean as “kelts” (a salmon that has spawned) and return to spawn in later years. (*Ibid.*)

5.3.1.3.2 Steelhead Condition Prior to Bradbury Dam

Historically, the Santa Ynez River probably supported the largest steelhead run in southern California, with 20,000 to 30,000 adult fish. (NOAA-13, p. 6.)³⁶ The historic availability of, and access to, year-round rearing habitat with appropriate water temperatures and a wide network of upstream tributaries was likely one of the primary

³⁶ Historically, the numbers of steelhead recorded in the other rivers and creeks in the Southern California DPS were as follows: Ventura River – 4,000 to 6,000; Santa Clara River – 7,000 to 9,000; Malibu Creek – 1,000; and Matilija Creek – 2,000 to 2,500. (NOAA-12, pp. 5-6.)

reasons for the large steelhead runs. (NOAA-7A, FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-3.) The substantial reduction in the amount of such accessible habitat in the Santa Ynez River system is a significant limiting factor. (R.T. October 23, 2003, p. 509:14-509:18; R.T. November 12, 2003, pp. 645:22 to 646:2.) As the result of flashy³⁷ flows in the lower portions of the Santa Ynez River, steelhead historically evolved to spawn and rear in the upper portions of the river above the current site of Bradbury Dam where there were perennial sources of water with temperature and dissolved oxygen levels that were consistently more favorable. (R.T., October 23, 2003, p. 584:1-584:10; FEIR, Vol. II, p. 4.7-22.) Historically, the mainstem of the Santa Ynez River was used as a migratory corridor to the upper reaches and to access surrounding habitat. (*Id.*, p. 548:20-548:24.) Today, the lower Santa Ynez River mainstem and its tributaries below Bradbury dam are the only potential habitat accessible to steelhead.

Gibraltar and Juncal Dams, built in 1920 and 1930 respectively, were the first manmade obstructions to block steelhead access to the upper Santa Ynez River. Gibraltar Dam cut off approximately one third of the historic steelhead spawning and rearing habitat. (R.T., November 12, 2003, p. 644:7-644:9.) By 1944, fisheries biologists reported that forest fires, groundwater pumping for irrigation, and water storage and diversion in the upper watershed at Gibraltar and Juncal Dams had reduced stream flow during the dry season in the lower Santa Ynez River. (NOAA-10, p. 4.) In 1945, CDFW estimated that the steelhead run in the Santa Ynez River was only 13,000 to 25,000 adults. (R.T., November 12, 2003, pp. 643:23-644:1; NOAA-12, p.6.)

5.3.1.3.3 Impacts from Construction, Operation, and Maintenance of Bradbury Dam

The construction, operation, and maintenance of Bradbury Dam has been and continues to be a leading factor in the degraded condition of steelhead and their habitat in the Santa Ynez River. (FEIR, Vol. III, Appendix D, p. 29.) Bradbury Dam was constructed in 1953. By 1991, the Santa Ynez River steelhead run had been reduced from its historic annual level of 20,000 to 30,000 adult steelhead to a population of only 100 adult fish. (NOAA-12,

³⁷ The Santa Ynez River responds strongly to rainstorms in the watershed, but there is little flow in the river in dry weather. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-40.)

p. 6.) There are several reasons for this decline related to the construction, operation, and maintenance of Bradbury Dam. One of the most significant impacts caused by the construction of Bradbury Dam was blocking access to a major portion of the historic steelhead spawning and rearing habitat upstream of the dam. (NOAA-4, p. 3; FEIR, Vol. III, Appendix D, p. 29; DFG-2, p. 17; MU-226, p. 32.)

The mainstem Santa Ynez River and its tributaries upstream of Bradbury Dam provide significantly more potential spawning and rearing habitat for steelhead than is available downstream of the dam. At the hearing, NMFS presented evidence that 29 percent of the potential steelhead spawning and rearing habitat is downstream of Bradbury Dam and 71 percent is available upstream. Specifically, there are 43 miles of habitat in the mainstem river upstream of Bradbury Dam and 205 miles in upstream tributaries. (NOAA-7A, NOAA-7B, NOAA-7C.) One of the critical recovery actions NMFS lists in the Draft Steelhead Recovery Plan is unimpeded volitional migration of steelhead to upstream spawning and rearing habitats. (FEIR, Vol, II, p. 2.0-43.) NMFS emphasized that restoring access to the Santa Ynez River mainstem and tributaries upstream of Bradbury Dam is critical to promote important life history traits such as the capacity to migrate long distances and withstand warmer temperatures. (*Id.*, p. 2.0-44.)

Since construction of Bradbury Dam, steelhead spawning and rearing has been limited to areas below the dam where conditions are less suitable for steelhead. (R.T., October 23, 2003, p. 549:4-549:6.) Without access to the upstream areas for spawning and rearing, the steelhead population in the Santa Ynez River is considered by NMFS to be extremely vulnerable to extinction because of drought or other climatic phenomenon. (*Id.*, p. 584:16-584:21.)

Operations of Bradbury Dam have modified the timing and reduced the amount of migration flows, and have even reduced the number of days that migration is possible in some years. (FEIR, Vol. III, Appendix D, p. 29; MU-226, p. 6; MU-224, p. 3.) These flow modifications have constrained the biologically important genetic and life cycle diversity attributes of the population that increase its ability to withstand catastrophic events such as droughts. (FEIR, Vol. II, p. 2.0-29.) Operations of the dam have also resulted in an

increased potential for mortality from stranding and desiccation caused when surface flows in tributaries where fish are residing are disconnected from the main channel. (FEIR, Vol. III, Appendix D, pp. 29, 52.)

The regulation of flows and the trapping of sediment in the Santa Ynez River by Bradbury Dam have also resulted in a modification of stream hydrology and sediment transport characteristics in a manner that affects downstream habitat quality and quantity. (NOAA-3, p. 3.) Reducing the sediment supply to downstream reaches diminishes the size and number of pools and riffles. (*Ibid.*) Trapping the sediments also reduces the size and extent of gravel patches used for steelhead spawning. (*Ibid.*) In addition, the reduction in the sediment load below Bradbury Dam has affected the riparian vegetation by decreasing the rate of riparian recruitment and the associated food production and temperature benefits that riparian vegetation provides. (FEIR, Vol. II, p. 4.8-6.)

Reservoir operations also modify natural flow patterns in a manner favorable to predator species and other exotic species. (FEIR, Vol. II p. 4.7-25.) Specifically, reservoir operations have homogenized naturally flashy flows through reductions in high flow and low flow events. (*Ibid; id.*, p. 4.8-6; NOAA-3, p. 2; R.T. November. 12, 2003; p.655:7–655:24.) Predation mortality of all size classes of steelhead, which is exacerbated by the presence and operations of the dam, has been identified as a significant factor affecting population abundance and survival in the Santa Ynez River. (FEIR, Vol. II, p. 4.7-23.) Identified predators include largemouth and smallmouth bass, channel catfish, sunfish, crappie, and other piscivorous (fish eating) fishes. (*Ibid.*) Largemouth bass, introduced into Cachuma Reservoir, have successfully colonized and maintained a population throughout the lower Santa Ynez River. (*Ibid.*) Juvenile largemouth bass have also been observed in Hilton and lower Salsipuedes Creeks, although none have been observed in Hilton Creek since initiation of a watering system in 2000. (*Ibid.*) Co-occurrence of largemouth bass and steelhead has been documented at several sites within the mainstem. (*Ibid.*) Although each species appears to utilize different areas of the pools, predation pressure is thought to increase as pools shrink during the summer months. (*Ibid.*) Bullfrogs and crayfish have also been observed preying on eggs and juvenile

steelhead. (*Ibid.*) Bullfrog numbers have increased since 2000, as flows have been more consistent and longer reaches of the mainstem remain wetted. (*Ibid.*)

The proliferation of the American beaver (*Castor canadensis*) population may also be due to the modification of Santa Ynez River flows resulting from the construction of Bradbury Dam. Beaver activity is highest in areas with perennial flows. (FEIR, Vol. II, p. 4.7-22.) Their dams are an impediment to fish passage in the mainstem, especially in dry years. (MU-226, p. 6; CT-39, pp. 1-2.) The dams impound water especially at low flows. (R.T., October 22, 2003, p. 301:22-301:23; MU-224, p. 18.) Beaver dams also alter channel velocity, changing local erosion and deposition patterns, altering riparian vegetation and large woody debris cover. (FEIR, Vol. II, p. 4.7-22.) Beavers have been observed in the Highway 154 Reach, and Salsipuedes and El Jaro tributaries. (*Ibid.*) Pools formed by beaver ponds dominate habitat two miles below the Lompoc Wastewater Treatment Plant. (*Id.*, p. 4.7-18.) Over 100 beaver dams were observed in fall 2009 between Bradbury dam and the ocean. (*Id.*, p. 4.7-22.)

5.3.1.3.4 Determining Sufficient Steelhead Condition Post Construction of Bradbury Dam

Although Fish and Game Code section 5937 requires that enough water be released to keep fish below the dam in “good condition”, this term is not defined. The State Water Board needs criteria to be able to determine the status of the fishery. Dr. Peter Moyle, professor of fisheries biology at the University of California, Davis, and an expert witness for CalTrout, has developed and proposed a definition of fish in good condition. Both Dr. Robert Titus, CDFW staff environmental scientist and Ms. Baldrige supported the use of Dr. Moyle’s definition for good condition. Ms. Baldrige co-authored the paper with Dr. Moyle in which this definition of good condition was developed. (MU-226, pp. 43, 46; R.T., October 22, 2003, pp. 386:13 to 388:2.) Dr. Titus testified that Dr. Moyle’s approach for defining good condition is perhaps the most applicable for achieving sustainable production of steelhead in the Santa Ynez River system. (DFG-4, p. 6; R.T., October 23, 2003, p. 518:12-518:16.) Based on the information in the record, Dr. Moyle’s definition appears to be a reasonable and proper interpretation of “good condition,” as the term is

used in section 5937 of the Fish and Game Code. Accordingly, Dr. Moyle's definition will be used in this order.

Dr. Moyle defines good condition at three consecutive levels: the individual, the population, and the community. According to Dr. Moyle, to satisfy Fish and Game Code section 5937, fish have to be in good condition at all three levels. (CT 70, p. 3.)

Individual Level

According to Dr. Moyle, at the individual level, fish in good condition must be healthy. This means they must be relatively free of diseases and parasites, have robust appearance (i.e., have a suitable weight for a given length), have a growth rate appropriate for the region (i.e., not be stunted), and should respond in an appropriate manner to stimuli (e.g., can avoid predators, including anglers). (CT-70, p. 2.) If water releases from a dam are unfavorable (e.g., too warm, too low, too turbid) to a given species of fish, it is likely that individuals will be underweight, suffer from outbreaks of parasitic infections, and be more susceptible to predators, especially non-native predators such as largemouth bass, or to dying of stress-related disease. (*Ibid.*) Ms. Baldrige testified that the criterion of healthy individuals is met for steelhead in the Santa Ynez River, based on snorkel survey data between 1993 and 1999. (MU-226, p. 43.) Fish captured in the trapping operations and those observed during snorkel surveys are disease-free, exhibit appropriate size, and are able to exhibit predator avoidance reactions. (*Ibid.*)

Population Level

For fish to be in good condition at the population level, each population must:

- 1) Be made up of healthy individuals,
- 2) Have multiple age classes, which is evidence of successful reproduction and recruitment, and
- 3) Have a viable population size.

(CT-70, pp. 2-3.)

While the steelhead fishery in the Santa Ynez River may have sufficiently healthy individuals, which meet the first criterion for a population in good condition, it does not appear to have adequate multiple age classes or a viable population size.

The second criterion for good condition of the population level is having multiple age classes. Ms. Baldrige testified that steelhead are completing their life-history in the Santa Ynez River and although observed numbers are low, multiple age classes are present. (MU-226, p. 43.) There is evidence of reproduction, emergence, rearing, smolting, and returning adults. (*Id.*, pp. 43-44.) While there may be multiple age classes present, as Mr. Thomas Keegan, a senior fisheries scientist who appeared as an expert witness on behalf of CalTrout, testified, steelhead that are present in the mainstem below Bradbury Dam are not abundant in multiple age classes. Dr. Charles Hanson, a senior fishery biologist who appeared as an expert witness on behalf of the Member Units, presented a graph entitled, "Total Fall Standing Crop *O. mykiss* (Hilton Creek and Mainstem to Alisal)," which contains information compiled from snorkel survey data and visual observations each fall from 1995 to 2011. (MU-294, p. 2; R.T., March 29, 2012, pp. 260:13-261:10.) Dr. Hanson's graph shows as many as 13,500 steelhead were present in 2006. (MU-294, Figure 1 p. 2.) However, as Dr. Hanson confirmed, the graph does not differentiate between rainbow trout and steelhead, or between juveniles and adults. (R.T., March 30, 2012, p. 26:3-26:11.) This is not uncommon, as resident and anadromous life forms are difficult to distinguish based on visual observation, particularly at the juvenile stage. (R.T., March 29, 2012, pp. 260:22 to 261:3.)

Dr. Mark Capelli, area recovery coordinator for NMFS for the South Coastal portion of California, gave some perspective to this figure by describing the 1945 CDFW report that documented the 1944 fish rescue by CDFW of over a million young steelhead from the partially dry bed of the Santa Ynez River above the site of the proposed Cachuma Dam. The report further noted that these fish probably represented only a small fraction of the young steelhead produced, since large numbers migrated downstream prior to the start of the rescue operations or remained in localities inaccessible to the rescue crews. The steelhead population in the Santa Ynez River has significantly declined from historical levels of over a million juvenile steelhead in 1944, to a recent high of less than 14,000

steelhead and rainbow trout. The number of smolts captured from 2000 to 2010 in Hilton Creek, Salsipuedes Creek, and the mainstem lower Santa Ynez River peaked at 438 in 2006. (FEIR, Vol. IV, Appendix G, Table 1 and Figure 2.)

The observed numbers of adult steelhead are also extremely low. Information regarding the current condition of steelhead is provided by trapping results, snorkel survey results, and habitat assessments from 2005 to 2010, which are contained in Appendix G of the FEIR. In Salsipuedes and Hilton creeks, and in the lower mainstem of the Santa Ynez River, the number of steelhead adults captured from 2005 – 2010 peaked with only 16 in 2008. No adult steelhead were captured in 2000, 2002, 2004 or 2007. One adult was captured in each of the years 2003, 2005, 2006, 2009 and 2010. Four adults were captured in 2001. (FEIR, Vol. II, p. 2.0-40; *Id.*, Vol. IV, Appendix G, Table 2 and Figure 3.) Fish traps are not intended to capture all adult fish in the system. However, these figures indicate that the number of adult steelhead is very low. Dr. Capelli testified that according to a 1996 assessment by NMFS, the estimated total run size for the Santa Ynez River was reported at less than 100 adults per year, a decline of greater than 99 percent since 1950. (NOAA-6, p. 2.) Mr. Craig Wingert, a fishery manager at NMFS, testified that a population size of less than 100 adult steelhead on a river the size of the Santa Ynez is not viable or large enough to maintain genetic diversity in the long run. (R.T., November 12, 2003, p. 754:12-754:25.)

The last criterion for meeting the population level criteria of good condition is a viable population size. According to Dr. Moyle, a viable population is one that is large enough that it will not go extinct from random factors or unusual events, such as a major drought. (CT-70, p. 3.) Dr. Moyle testified that the determination of the actual viable population size for a species usually requires extensive study of its demographic characteristics, such as age structure, mortality rates, and growth rates. (*Id.*, p. 2.) According to testimony by Ms. Baldrige, Dr. Titus, and Mr. Dennis McEwan, who is a Senior Environmental Specialist with CDFW, a viable population size for Santa Ynez River

steelhead is currently unknown.³⁸ (R.T., October 22, 2003, pp. 389:16-389:17, 423:3-423:5, 444:14-444:19, 445:8-445:9 [Ms. Baldrige]; R.T., October 23, 2003, p. 528:16-528:24 [Dr. Titus and Mr. McEwan].)

One potential estimate for viable population size discussed during the hearing was the steelhead run size in the NMFS Draft Steelhead Recovery Plan (Recovery Plan). To be considered viable, the Recovery Plan indicates that the steelhead run size needs to be sufficient to result in an extinction risk of less than 5 percent within 100 years, which is estimated at 4,150 spawning adults per year for the Southern California DPS. (FEIR, Vol. II, p. 2.0-43.) However, there was conflicting testimony regarding the geographic extent of the 4,150 fish needed to meet this criterion. Dr. Hanson testified that the separate watersheds comprising the Biogeographic Population Group,³⁹ which are groups of watersheds and subwatersheds that comprise the DPS, are treated as individual steelhead populations for the purposes of meeting the run criteria in the Recovery Plan. (R.T., March 30, 2012, p. 28:5-28:7.) According to Dr. Hanson, this could mean that 4,150 steelhead would be the population size necessary for each of the individual watersheds in Southern California DPS. (*Id.*, p. 28:8-28:10.) However, based on his expectation of watershed production in Southern California, Dr. Hanson asserted that the recovery goal of 4,150 adult steelhead should not apply to individual river systems, but instead to the entire DPS. (*Id.*, pp. 28:20 to 29:5.) In contrast, Dr. William Trush, a geomorphologist and fish biologist who appeared as an expert witness on behalf of CalTrout, testified that NMFS estimated that the minimum viable population size for the Santa Ynez River is a run size of 4,150 adults for recovery of the species. (CT-120, p. 8.)

Historical steelhead information is relevant to this issue. The historic adult steelhead run size in the Santa Ynez River watershed averaged 20,000 fish. (CT-90, p. 3.) Evidence

³⁸ NMFS indicated in their December 8, 2016 comment letter that information regarding the metrics that are pertinent to the viability for either an individual population of steelhead or the Southern California DPS of steelhead are set forth in the NMFS Southern California Steelhead Recovery Plan (SCSP). However, the contents of the SCSP are not part of the evidentiary hearing record as described in footnote 29. (NMFS, December 8, 2016 comment letter, p. 10.)

³⁹ The Santa Ynez River is one of the four major rivers, along with the Santa Maria, Ventura, and Santa Clara Rivers, included in the Monte Arido Highlands Biogeographic Population Group. (FEIR, Vol. II, p. 2.0-42.)

shows that the Santa Ynez River was of major importance as a spawning ground and nursery stream that supported the largest steelhead run in southern California. (CT-96, pp. 4-5, NOAA-6, p. 3.) In the late 1940s, the Santa Ynez River was recognized as the most productive steelhead river in Southern California. (CT-96, pp. 5-6.) The Santa Ynez River was likely among those river systems, if not the river system, that served as a key source of steelhead production for the DPS as a whole and served as a source population for many smaller streams before steelhead access to upstream spawning and rearing habitat was lost due to the construction of dams. (NOAA-2, p. 5.) Therefore, it is reasonable to conclude that the minimum viable population size for the Santa Ynez River is a run size of 4,150 adults. Regardless of which interpretation is the correct interpretation of the recovery goal, it is likely not possible to achieve recovery without a sufficiently robust population in the Santa Ynez River.

The Santa Ynez River steelhead has been listed as 'endangered' under the federal ESA because of its greatly reduced range and population size. (R.T., November 12, 2003, p. 802:10-802:14.) This means that the steelhead are a population considered to have a high risk of extinction in the near future. (*Ibid.*; accord 16 U.S.C. § 1532(6) [endangered species means "any species which is in danger of extinction throughout all or a significant portion of its range"].) Ensuring the ability of the Santa Ynez River steelhead population to continue to exist into the future while retaining its potential for recovery is critical to the DPS's survival and recovery. (FEIR, Vol III, Appendix D, p. 19.) Given this information and the low population numbers, especially for adult steelhead in the Santa Ynez River, the current population level is not meeting Dr. Moyle's population criterion for good condition.

Dr. Moyle and Ms. Baldrige testified that a reasonable surrogate for an actual population estimate for determining "good condition" is the presence of habitat or, as Dr. Moyle described it, "the presence of extensive habitat for all life history stages over long reaches of stream." (CT-70, p. 3 [Dr. Moyle]; R.T., October 22, 2003, p. 388:19-388:22 [Ms. Baldrige].) Dr. Trush testified that, based on his understanding of the number of miles of habitat below Bradbury Dam and general knowledge of the population of

steelhead, he does not believe there is currently enough habitat available below the dam for all life stages of steelhead to avoid extinction. (R.T., March 29, 2012, p. 229:1- 229:8.)

Community Level

A fish community is in good condition where the community has persisted for thousands, if not millions, of years as a predictable structure indicated by very limited overlap in the niches occupied by individual fish among the community and the presence of multiple levels in the food web. (R.T., November 12, 2003, p, 803:13-803:18.) A healthy fish community should be very resilient in recovering from extreme events, which is why size of the population and spatial extent of the habitat are important. (*Id.*, 2003, p. 803:19-803:21.) To be healthy, a fish community must be persistent in species membership through time and should be replicated geographically. (*Id.*, p. 803:19-803:23.)

Ms. Baldrige testified that the fish populations in the Santa Ynez River fail to meet the criteria for good condition at the community level. The current fish species assemblage downstream of Bradbury Dam is dominated by non-native species. (CT-30, p. 4.)

Ms. Baldrige stated that native fish populations in the Santa Ynez River may never be in good condition at the community level because of predation by exotic species and favorable habitat conditions for those predators. (R.T., October 22, 2003, p. 447:12-447:17.) Ms. Baldrige testified that these issues are difficult to address due to a source population of predators in Cachuma Reservoir and the lack of access for steelhead to mainstem habitat. (MU-226, p. 45.) Exotic species are often an indicator of habitat change, and the presence of numerous exotics often indicates poor habitat. (R.T., November 12, 2003, p. 855:16-855:18.)

Additional/Improved Habitat

To support a viable population of steelhead in the Santa Ynez River throughout the riverine life stages, adequate habitat quality and quantity must be available. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-16.) While habitat can be restored through physical restoration and improvement projects, many aspects of habitat are directly related to the flow of the river. Currently, over-summering rearing habitat is an important limiting factor for steelhead populations in the Santa Ynez River. (FEIR, Vol. II,

p. 4.7-45.) The most important flow-related aspects of rearing habitat found to be limiting in the lower Santa Ynez River watershed are water quality, the amount of physical space available, and passage opportunities. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-34; MU-226, p. 9.) Without access to habitat above Bradbury Dam, at a minimum, more habitat will need to be provided below Bradbury Dam to improve the steelhead population's condition.

Increased flow can create additional habitat, improve the quality of habitat, and increase passage opportunities. All habitat types (riffles, runs, pools, glides) in the Highway 154, Refugio, and Alisal reaches increase with increases in flow. (MU-226, p. 10.) Increased flow can expand the width of the channel, providing additional inundated gravel areas, increasing water depth, and improving pool and run habitats, which are the primary rearing areas for steelhead. (MU-224, p. 3.) In addition to providing increases in specific limited habitat types, providing additional habitat in general may reduce predation pressure. (FEIR, Vol. II, p. 4.7-23.) Additional flow also benefits the steelhead fishery by supporting aquatic insects and riparian growth, which improve the quality of habitat. (FEIR, Vol. II, pp. 4.9-16, 4.7-12.) Additional flows can also increase passage and migration opportunities.

5.3.2 Passage Measures Needed to Protect Steelhead in the Santa Ynez River

Testimony and evidence submitted by CDFW and NMFS clearly indicate the necessity of providing steelhead passage around Bradbury Dam. Prior to the construction of Bradbury Dam, steelhead accessed the upper reaches of the Santa Ynez River and could take advantage of the permanent water supplies in these reaches for spawning, rearing (the most limiting habitat), and summer refugia. (R.T. October 23, 2003, pp. 548:8 to 549:2; p. 554:9-554:13; NOAA-2, p. 5; NOAA-3, p. 2; NOAA-4, p.3; NOAA-5, p. 3; NOAA-6, pp. 3-4.) As stated earlier, 71 percent of the potential steelhead spawning and rearing habitat is upstream of Bradbury Dam with 43 miles of habitat in the main-stem river and 248 miles of habitat in the tributaries. (NOAA-7A, NOAA-7B, NOAA-7C.) The United States Forest Service (U.S. Forest Service) evaluated habitat conditions above Bradbury Dam and concluded that with passage for steelhead over Bradbury Dam, the Santa Ynez River could support a steelhead run of 1,800 to 4,000 adult steelhead. (CT-12, p. 9.) In

addition to providing more habitat for steelhead, providing passage around Bradbury Dam may also help to maintain the anadromous life history traits of steelhead in the upper reaches and provide for life history and genetic diversity. (DOI-1f, Vol. II, Appendix E, p. E-4-7.) Currently, passage upstream of Bradbury Dam is not possible, and steelhead can only move downstream when there are spill events at the reservoir.

In 2000, to evaluate actions that could potentially benefit steelhead populations in the Santa Ynez River basin, SYRTAC created a sub group called the Upper Basin Work Group (UBWG)⁴⁰, who prepared initial recommendations whether these actions should be pursued further. (DOI-1f, Vol. II, Appendix E, p. E-1-1.) UBWG considered four alternatives to provide passage around Bradbury Dam including:

- 1) A fish ladder at Bradbury Dam,
- 2) A fish ladder from Hilton Creek to Lake Cachuma,
- 3) A bio-engineered fish passage channel that would pass fish around or into Lake Cachuma, and
- 4) Trap-and-truck operations to move returning adult steelhead from below Bradbury Dam into the upper basin.

UBWG recommended that a fish ladder over Bradbury Dam or a bioengineered fish channel not be considered due to concerns with costs and technical feasibility. Specifically, UBWG identified concerns over lack of certainty that a ladder would be successful, difficulty with getting juvenile fish downstream of the dam, the continuous flow needed throughout a fish channel, and concerns with introducing an ESA species in the reservoir which may prohibit recreational fishing. (DOI-1f, Vol. II, Appendix E, p. E-4-7.)

UBWG concluded that trap-and-truck operations were the most feasible option for upstream passage of adults and downstream passage for outmigrating smolts. However, UBWG found trap-and-truck operations faced challenges to implementation as well.

⁴⁰ The administrative record does not contain information on the members who participated in the UBWG sub group. SYRTAC was composed of CDFW; NMFS; Reclamation; U.S. Forest Service; Natural Resource Conservation Service; CalTrout; Santa Barbara Urban Creeks Council; Central Coast Regional Water Quality Control Board; CCWA; Santa Barbara County Fish and Game Commission; California Coastal Commission; USFWS; CCRB; SYRWCD; SYRWCD, ID No. 1; SBCWA; and the City of Lompoc. (FEIR, Vol. II, p. 2.0-16.)

(DOI-1f, Vol. II, Appendix E, pp. E-4-4 to E-4-7.) Due to these challenges, the UBWG recommended the implementation of habitat rehabilitation and enhancement efforts below Bradbury Dam be carried out and monitored, and that an Adaptive Management Committee continue to investigate opportunities to provide passage for steelhead. (*Ibid*; See R.T., October 23, 2003, pp. 520:21 to 521:16.) Given the importance of passage around Bradbury Dam to keeping steelhead in good condition in the Santa Ynez River and the preliminary nature of previous analyses into this issue and technological improvements since that time, as requested by the fish agencies, this order directs Reclamation, in consultation with the fisheries agencies, to further investigate the feasibility of providing passage around Bradbury Dam for steelhead adults and smolts.

5.3.3 Measures to Protect Steelhead Downstream of Bradbury Dam

This section describes and evaluates:

- 1) The two remaining relevant flow alternatives that the FEIR analyzed for the protection of public trust resources below Bradbury Dam;
- 2) The alternatives' effects on the steelhead fishery;
- 3) Hearing participants' feedback;
- 4) The water supply effects of the alternatives;
- 5) The measures the Board determines are necessary to protect public trust resources; and
- 6) The studies, monitoring and reporting requirements the Board will require to ensure those measures are appropriate and effective and to inform future potential decisions by the Board related to the Cachuma Project.

5.3.3.1 Alternative 3C

5.3.3.1.1 Description of Alternative 3C

Currently, the Cachuma Project operates under the 2000 Biological Opinion, which is analyzed as Alternative 3C in the FEIR. Operations under the 2000 Biological Opinion/Alternative 3C include measures being undertaken by Reclamation to avoid jeopardy of the steelhead below Bradbury Dam which are part of the Southern California DPS of steelhead. The 2000 Biological Opinion/Alternative 3C contains mandatory terms

and conditions, including operational changes that are required to implement 15 specific “reasonable and prudent measures” necessary to minimize take of the steelhead.⁴¹ The 2000 Biological Opinion/Alternative 3C requires implementation of most of the operational changes and conservation measures described in the 1999 Biological Assessment, along with additional operational, reporting and monitoring requirements. The 2000 Biological Opinion/Alternative 3C includes emergency winter storm operations, SWP mixing and associated water release restrictions, Hilton Creek gravity feed and pumped releases, Order WR 89-18 requirements, and conjunctive use of fish flow releases with a revised ramping schedule. The 2000 Biological Opinion/Alternative 3C also requires water releases from Bradbury Dam to meet mainstem rearing and passage flows as well as non-flow fish conservation measures, which are discussed in the following section.

5.3.3.1.2 Rearing and Passage Flows

The 2000 Biological Opinion/Alternative 3C includes instream flow requirements designed to: 1) improve summer rearing habitat conditions for steelhead in lower Hilton Creek and in the mainstem from Bradbury Dam to the Highway 154 Bridge; and 2) increase the number of days that appropriate conditions are provided for migration between the mainstem river and tributaries near Bradbury Dam. (FEIR, Vol. II, pp. 2.0-28, 2.0-30.)

To increase rearing habitat below the dam, the 2000 Biological Opinion/Alternative 3C includes the Mainstem Rearing Flows identified in Table 1. As depicted in Table 1, the amount and location of the rearing flows depend on the amount of reservoir storage and spill. Maintaining the rearing flows for steelhead will provide increased low flow summer rearing habitat when compared with recent or historical conditions. (FEIR, Vol. III, Appendix D, p. 62.)

To supplement passage flows and increase the number of days that migration is possible from the mainstem river to tributaries near Bradbury Dam, the 2000 Biological

⁴¹ Table 2-4A of the FEIR, entitled Summary of Reasonable and Prudent Measures/Terms and Conditions Described in the Cachuma Project Biological Opinion and Status of Compliance, summarizes the implementation and compliance status for each measure and term and condition. (FEIR, Vol. II, pp. 2.0-21 to 2.0-24)

Opinion/Alternative 3C allocates 3,200 af of water to the Fish Passage Account upon surcharge of the reservoir. The water is required to be released between January and May to extend the receding limb of naturally occurring storm hydrographs once the sandbar at the mouth of the river has been naturally breached. The 2000 Biological Opinion/Alternative 3C requires releases from the Fish Passage Account following a storm event when flows have receded to 150 cfs at Solvang. Storms are defined as flows of 25 cfs or greater at the Solvang U.S. Geological Survey gauge location. If storms do not produce 150 cfs at Solvang, but flows exceed 25 cfs, then releases are required achieve 150 cfs. The combination of natural flows and the Fish Passage Account releases will provide an average of 14 days or more of passable flows to facilitate steelhead migration to the mainstem and tributaries above Alisal Road. (FEIR, Vol. II, p. 2.0-31.)

5.3.3.1.3 Habitat Improvement Projects

Tributary habitat provides an extremely important opportunity for steelhead. (R.T., October 22, 2003, p. 289:15-289:16.) Protection and enhancement of steelhead spawning and rearing habitat in the tributaries will increase the availability and quality of habitat for steelhead. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. iii.) Good quality habitat for steelhead exists in both Salsipuedes Creek and its tributary El Jaro Creek. (FEIR, Vol. III, Appendix D, p. 28.) Salsipuedes Creek has good canopy cover, as well as pool and riffle areas for spawning and rearing habitat near its confluence with El Jaro Creek. Nojoqui Creek appears to contain good spawning and rearing habitat in its upper reaches. (*Ibid.*) One and a half to 3 miles upstream from the confluence of Quiota Creek and the Santa Ynez River, good canopy conditions provide shading within this section and pool habitats have good depth and complexity of instream cover. In addition, numerous undercut banks exist, particularly in pools, which provide excellent rearing habitat. Substrate is composed of larger size gravel, cobbles, and boulders. (*Id.*, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-48.)

As discussed above, the construction of Bradbury Dam severely limited access to steelhead spawning and rearing habitat. To address this, Reclamation proposed in the 1999 Biological Assessment to implement physical habitat improvement projects,

including the removal of fish passage barriers on tributaries to the Santa Ynez River below Bradbury Dam and to complete them by 2005. The impediments include culverts, road crossings, and boulder cascades. Removal of these impediments would increase access to suitable spawning and rearing habitats, thereby expanding the total available habitat for steelhead on the lower river. The 2000 Biological Assessment identified the highest priority tributaries as being Hilton, Salsipuedes, El Jaro, and Quiota creeks because they have perennial flow in their upper reaches and can support spawning and rearing. (FEIR, Vol. III, Appendix C, p. 3.-47.)

The 2000 Biological Opinion/Alternative 3C requires the removal of at least 11 passage impediments on the following tributaries: Hilton Creek (one on federal land and one under Highway 154); Salsipuedes Creek (Highway 1 Bridge); Quiota Creek (six road crossings); El Jaro Creek (one road crossing); and Nojoqui Creek (one road crossing). (FEIR, Vol. III, Appendix D, p. 14.) During implementation of tributary passage projects, the 2000 Biological Opinion/Alternative 3C requires Reclamation to minimize turbidity, sedimentation,⁴² loss of riparian vegetation and to relocate steelhead. (*Id.*, p. 68.) The 2000 Biological Opinion concludes that approximately 12 miles of tributary habitat will be made more accessible to steelhead through implementation of the proposed projects discussed above. (FEIR, Vol. III, Appendix D, p. 43.) Ms. Baldrige testified that since adoption of the 2000 Biological Opinion, Reclamation and the Cachuma Member Units have implemented projects to make an additional 13.9 stream miles of steelhead habitat available. (MU-290, p. 2.)

Of the 11 tributary improvement projects required by the 2000 Biological Opinion/Alternative 3C, three have been completed, two were proposed for removal from the 2000 Biological Opinion,⁴³ and six road crossing projects on Quiota Creek were in

⁴² During the implementation of the tributary improvement projects, deposition or accumulation of fine sediments (sedimentation) may occur. Increases in fine materials from sedimentation, or cementing of gravels with fine materials, restrict water and oxygen flow through the redd to the fertilized eggs. These restrictions increase egg mortality. (MU-224, p. 3.)

⁴³ Reclamation has not considered constructing the Hwy 154 Culvert on Hilton Creek project due to potential legal challenges from an adjacent landowner and design constraints related to the culvert gradient being too steep for fish passage. (FEIR, Vol. II, p. 2.0-32.) Analysis of the passage impediment at the Hwy 101 Culvert on Nojoqui Creek, completed in 2003, found that implementation of the project

design in December 2011 when the FEIR was completed. (FEIR, Vol. IV, Appendix G, Table 22.) Of the three completed projects, the Hilton Creek Cascade Chute Project provides steelhead access to 2,980 feet of suitable habitat. (*Id.*, Vol II, p. 2.0-32.) The Salsipuedes Creek Highway 1 Fish Passage Project successfully restored passage to 12.5 miles of suitable habitat for juveniles and adults. (*Id.*, pp. 2.0-32 to 2.0-33.) The Cross Creek Ranch on El Jaro Creek Project restored 250 feet of channel bank and installed a series of five rock weirs within the active channel to allow fish passage over a low flow crossing on El Jaro Creek. (*Id.*, p. 2.0-34.)

In addition to the above, other habitat improvements have also been completed including:

- 1) The Hilton Creek Watering System, completed in 2000, provides year-round flows of cool, well-oxygenated water from Lake Cachuma via three separate outlets to Hilton Creek and the Stilling Basin (FEIR, Vol II., pp. 2.0-35 to 2.0-36);
- 2) The Salsipuedes Creek Jalama Road Bridge Fish Passage Project, completed in 2003, provides additional passage opportunities and oversummering habitat on Salsipuedes Creek (FEIR, Vol II., p. 2.0-33);
- 3) The El Jaro Creek Rancho San Julian Fishway, completed in 2009, provides passage over a 7-foot-high migration barrier on El Jaro Creek (FEIR, Vol II., p. 2.0-34); and
- 4) The El Jaro Creek Demonstration Projects which identify feasible and cost-effective sediment management solutions on El Jaro Creek. (*Id.*, p. 2.0-33.) By 2011, three projects had been completed that reduced erosion within the creek which involved replacing a culvert, filling of a scour hole with large boulders, and floodplain enhancement. (FEIR, Vol II., p. 2.0-33.)

The 2000 Biological Opinion required Reclamation to reinitiate consultation if the projects were not completed by 2005. Because Reclamation did not complete all of the required projects by 2005, Reclamation reinitiated consultation in December 2005. The impacts of the Quiota Creek improvement projects have been evaluated at a programmatic-level under CEQA; however, they have not undergone a project-level review. (FEIR, Vol. II, pp. 5.0-1 to 5.0-2.) COMB is the appropriate CEQA lead agency to conduct a project-

was not warranted due to the lack of significant biological benefit and the high cost associated with enhancing passage. Nojoqui Creek was initially designated as critical habitat for steelhead in the lower Santa Ynez River, but this designation has since been removed. (*Id.*, p. 2.0-35.) In December 2005, NMFS was informed that these two projects would not be completed. (MU-290, p. 2.)

level environmental review of any non-flow habitat enhancement measures that it is funding and implementing. (*Ibid.*, p. 5.0-1.) This order does not require completion of the tributary improvement projects on Quiota Creek.

5.3.3.1.4 Evaluation of Alternative 3C

Implementation of the 2000 Biological Opinion/Alternative 3C benefits the steelhead population. Implementation of the 2000 Biological Opinion/Alternative 3C substantially increases the frequency of years with passage from the ocean to the dam for anadromous steelhead and the amount of steelhead spawning habitat. (FEIR Vol. II, pp. 4.7-46 to 4.7-48.) Frequency and quality of fry rearing habitat flows under 2000 Biological Opinion/Alternative 3C significantly improves fry rearing conditions compared to baseline operations (Alternative 2). (*Id.*, pp. 4.7-46 to 4.7-50.) In addition, because of implementation of the 2000 Biological Opinion/Alternative 3C, riparian vegetation has increased since 2000 and canopy coverage is increasing as well. (*Id.*, p. 4.7-49.)

As described above, steelhead habitat conditions have improved from baseline conditions due to implementation of the increased flows under the 2000 Biological Opinion/Alternative 3C. However, according to Dr. Trush, the flows implemented under the 2000 Biological Opinion are not adequate to result in a viable steelhead population. (R.T. March 29, 2012, p. 228:2-228:6.) He testified that, “without a measurable increase in the predicted or observed adult run size for the lower Santa Ynez River, the FEIR cannot conclude that flows implemented under the 2000 Biological Opinion have resulted in increased abundance of steelhead in the lower Santa Ynez River.” (CT-120, p. 6.) Dr. Trush further opined that, given the implementation of the 2000 Biological Opinion for 16 years without any measurable increase in the adult steelhead population, the 2000 Biological Opinion would not by itself be sufficient to protect steelhead as a public resource. (See generally CT-120, pp. 6-8 [discussing population viability].) “More smolts, and larger smolts, are needed to produce more adults, but there is no reasonable basis to expect this to occur under the provisions of the 2000 BiOp given the outcomes from the last 10 years.” (CT-120, p. 8.)

Dr. Hanson testified that it could take 80 to 100 years to fully take advantage of the kind of habitat restoration actions and the other actions that are being taken within the basin to fully recover the steelhead populations. (R.T., March 30, 2012, p. 5:4-5:8.) While the Board acknowledges the benefits of the 2000 Biological Opinion/Alternative 3C, the limited timeframe between its implementation and the most current information in the record regarding the condition of the steelhead population as a result of those efforts, and the realistic timeframe for recovery, for the following reasons, the Board finds that the 2000 Biological Opinion/Alternative 3C is insufficient by itself to restore steelhead in the Santa Ynez River watershed to good condition.

While the 2000 Biological Opinion/Alternative 3C and the Board's objectives for the steelhead fishery are consistent, they are not the same. Both CDFW and NMFS, expressed concerns that 2000 Biological Opinion/Alternative 3C might not afford adequate protection to steelhead to achieve compliance with the Public Trust Doctrine. (R.T., November 12, 2003, p. 746:1-746:17.) The fundamental objective of the requirements in the 2000 Biological Opinion/Alternative 3C is to protect the Southern California DPS, including the Santa Ynez River steelhead population, at a level sufficient to avoid jeopardy to its continued existence. The 2000 Biological Opinion is not designed to achieve fish below a dam in good condition under section 5937 of the Fish and Game Code. The 2000 Biological Opinion/Alternative 3C requirements are intended to substantially enhance habitat conditions for steelhead in an effort to promote recovery of the Santa Ynez River steelhead population. But as clarified by Mr. Wingert, the measures identified in the 2000 Biological Opinion are not intended to restore the steelhead to the point that the fishery is a viable, self-sustaining population, which would be necessary to meet the criteria for fish in good condition. (*Id.*, Vol. III, Appendix C, 2000 Revised Biological Assessment, p. 3-7; NOAA-1, pp. 1-2; R.T., November 12, 2003, p. 745:9-745:14.)

Additionally, the 2000 Biological Opinion/Alternative 3C may not achieve the intended minimum protections. The 2000 Biological Opinion/Alternative 3C requirements represent the minimum flows and other measures needed to support the continued survival of steelhead in the Santa Ynez River. (FEIR, Vol. III, Appendix C, 2000 Revised

Biological Assessment, pp. 3-6 to 3-7; *Id.*, Vol. II, p. 4.7-26; but see FEIR, Vol. III, Appendix D, p. 67.) However, NMFS acknowledges that it cannot accurately predict if continuous surface flows will be maintained by releases made to meet the minimum flows and data is unavailable to assess the effect of those flows beyond ten miles below the dam. (FEIR, Vol. III, Appendix D, p. 52.) According to CDFW, evidence submitted in the Cachuma hearing suggests that despite the fact the 2000 Biological Opinion has been in effect for several years, the Cachuma Project does not comply with Fish and Game Code section 5937. (CDFW Closing Brief, p. 7.)

Adding further uncertainty to the protection the 2000 Biological Opinion/Alternative 3C provides is the incomplete implementation of its requirements. Reclamation did not complete some of the required habitat improvement projects. Without full implementation of the requirements of the 2000 Biological Opinion/Alternative 3C, it is uncertain whether the Cachuma Project will result in jeopardy to the steelhead in the Southern California DPS including those below Bradbury Dam, which is one of the reasons reinitiation of consultation was required. In Salsipuedes and Hilton creeks, and the lower mainstem of the Santa Ynez River, the number of anadromous steelhead adults captured from 2005 to 2010 peaked with 16 in 2008. (FEIR, Vol. II, p. 2.0-40; *id.*, Vol. IV, Appendix G, Table 2 and Figure 3.) Ten years after the implementation of the 2000 Biological Opinion, the Santa Ynez River steelhead population is not showing signs of recovery.

In light of the uncertain benefits of the 2000 Biological Opinion, both CDFW and NMFS requested that, if the Board incorporates the 2000 Biological Opinion into Reclamation's Permits, it only do so on an interim basis as part of a program that includes development of additional measures to provide adequate protection of steelhead in the lower Santa Ynez River. (CDFW Closing Brief, pp. 2, 12-13, 15; NMFS Closing Brief, p. 13; R.T., November 12, 2003, p. 628:4-628:9.) CDFW requested that the Board evaluate the effectiveness of the 2000 Biological Opinion in keeping steelhead in good condition, and mandate a study of the feasibility of providing fish passage around Bradbury Dam. (CDFW Closing Brief, pp. 13, 22.) CDFW also requested that the Board reopen Reclamation's Permits at a date certain or upon a future triggering event to analyze whether alternative flow releases are necessary to achieve full compliance with the Public

Trust Doctrine. (*Id.*, p. 12.) Similarly, NMFS stressed that information concerning the needs of the steelhead in the Santa Ynez River, such as water temperature requirements and instream and fish passage flows, is incomplete, and the feasibility of providing passage around Bradbury Dam should be studied further. (NMFS Closing Brief, pp. 11-12.) NMFS provided testimony indicating that restoring passage around Bradbury Dam, where the majority of the historic spawning and rearing habitat occurred and still persists, is necessary to restore viable steelhead runs to good condition in the Santa Ynez River and therefore protect the public trust interest in the steelhead resources of the Santa Ynez River. (NOAA-2, p. 5; NOAA-4, p.3; NOAA-5, pp. 1 and 3, NOAA-6, p.4; R.T., November 12, 2003, p. 748:3-748:11.) NMFS recommended that the Board not rely upon the analyses and conclusions of the 2000 Biological Opinion because reinitiation of consultation under the federal ESA is currently required, which will result in a new biological opinion. (R.T., March 29, 2012. p. 162:11-162:16.)

5.3.3.2 Alternative 5C

5.3.3.2.1 Description of Alternative 5C

In response to CalTrout's comments on the 2003 DEIR, the State Water Board developed Alternative 5C, which is a modified version of an alternative flow regime proposed by CalTrout (Table 2 Flows). Table 2 Flows are based on a 1989 Santa Ynez River draft Instream Flow Incremental Methodology (IFIM) study (Draft IFIM) conducted by the Department of Water Resources (DWR). (R.T., November 12, 2003, p. 791:4-791:15; CT-37.) Mr. Keegan, who appeared as an expert witness on behalf of CalTrout, testified that the IFIM is generally recognized as the best predictive method for determining potential habitat. An IFIM study is a transect-based methodology that uses a computer model called a Physical Habitat Simulation System (PHABSIM) to perform the analysis portion of an IFIM. (R.T., November 12, 2003, p. 818:6-818:15; CT-37, pp. 10, 31.) The primary parameters used in the model are depth, velocity, substrate, and cover, the primary habitat attributes for salmonids. (R.T., October 23, 2003, p. 592:13-592:18.) The objective of the PHABSIM model is to predict the amount of habitat provided at different stream levels. (NOAA-4, p. 2.)

Implementation of the CalTrout-recommended Table 2 Flows, in all water year types, would require Reclamation to release significantly more water from Bradbury Dam to protect fishery resources than required pursuant to the 2000 Biological Opinion. (FEIR, Vol. II, p. ES-5.) In order to minimize impacts to Cachuma Project yield, under Alternative 5C, the Cachuma Project would operate under two different sets of hydrologic conditions for releases of water from Cachuma Reservoir for fish. In years when the runoff condition is determined to be wet or above normal, the criteria for fish water releases would be based on the higher Table 2 Flows. In other years, when the runoff condition is determined to be below normal, dry, or critical, the criteria for fish water releases would be the same as the operating criteria under the 2000 Biological Opinion/Alternative 3C.

The water year hydrologic classification for the Santa Ynez River is based on inflows to Cachuma Reservoir for the period 1918 to 1993 (76 years) as indicated in the Santa Ynez River Hydrology Model (SYRHM) used in the analysis of the FEIR.⁴⁴ Water year classification was conducted to determine five water year types based on roughly twenty-percentile groupings of ranked data. The FEIR describes the development of the five water year types in greater detail. (FEIR, Vol. IV, Appendix F, Draft Technical Memorandum No. 5, pp. 7-8.)

Under Alternative 5C, the Table 2 Flows are triggered when the cumulative Cachuma inflow (beginning October 1) of 33,307 af is first reached during a water year. The probability of reaching the wet or above-normal year classification is highest in the month of February, with about 70 percent of these year classes (wet or above-normal) known by February or earlier. When the cumulative inflow (beginning October 1) to Cachuma Reservoir has not reached the wet or above-normal year classification, the operating

⁴⁴ The SYRHM includes operations of Juncal, Gibraltar, and Bradbury Dams, the Santa Ynez River Alluvial Groundwater Basin, and Santa Ynez River recharge (percolation) in Lompoc Plain Groundwater Basin. The model uses historic records of rainfall, runoff, evaporation, and tunnel infiltration for the period 1918 through 1993. Reservoir releases, diversions, stream flow percolation, groundwater pumping, and depletions are based on monthly time steps. The model includes Cachuma Project operations under State Water Board Order WR 73-37 as amended by Order WR 89-18 (Santa Ynez River Hydrology Model Manual, 9/8/1997). In addition, the model has been expanded to include releases for fisheries and SWP water deliveries through the Bradbury Dam outlet works.

criteria for fish water releases in Alternative 5C is the same as the 2000 Biological Opinion/Alternative 3C. (FEIR, Vol. IV, Appendix F, Draft Technical Memorandum No. 5, p. 8.)

5.3.3.2.2 Evaluation of Alternative 5C

The FEIR concluded that implementation of Alternative 5C would have beneficial effects on the Santa Ynez River steelhead population. The FEIR developed scoring criteria to compare and evaluate the alternatives and their flow-related effects on steelhead habitat. Specifically, the FEIR scored the alternatives effects on fish migration, spawning habitat, and fry and juvenile rearing habitat. Scores ranged from zero (0) to five (5) with higher scores of four (4) or five (5) given to flows likely to provide more habitat and lower scores of zero (0) or one (1) given for flows likely to provide less habitat. The habitat scores are derived from the average monthly flows calculated using simulated mean daily flows for the 76-year period of record (1918-1993) for each alternative using the SYRHM. The FEIR concluded that, in comparison to Alternative 2 (baseline conditions), Alternative 5C would result in substantial increases in the frequency of years with passage opportunities for steelhead due to the higher instream flow requirements. Passage opportunities created under Alternative 5C are very similar to 2000 Biological Opinion/Alternative 3C with both alternatives receiving the same average score. (FEIR, Vol. II, p. 4.7-46.) Alternative 5C would also benefit steelhead through increased spawning and rearing habitat compared to baseline operations. (FEIR, Vol. II, p. 4.7-47, 4.7-48.) Alternative 5C has the highest average scores for steelhead spawning and fry rearing habitat. (*Ibid.*) While the 2000 Biological Opinion/Alternative 3C has slightly better average scores for juvenile rearing habitat, Alternative 5C is the only alternative to achieve scores of five (5) for fry and juvenile rearing. The FEIR concludes that Alternative 5C would provide the greatest benefit to rearing habitat due to the higher Table 2 Flows provided in wet and above normal years. (FEIR, Vol. II, p. 4.7-50.)

Specifically with regard to the Table 2 Flows, the Board received testimony from CalTrout-witness Mr. Keegan that the Table 2 Flows, if provided in all water year types, would likely maintain steelhead populations in good condition. (R.T., November 12, 2003, p. 824:2-824:5.) Mr. Keegan specifically testified that Table 2 flow requirements would provide

sufficient flows to improve downstream rearing conditions into the Alisal Reach and likely below the Alisal Reach. Mr. Keegan stated that the increased flow through the riffles and glides would improve the quantity (e.g., improvements in velocity and depth) and quality (e.g., increased prey drift) of shallow rearing habitat, while improving pool habitat conditions (e.g., flow input to pool and through-pool flow.) (CT-30, p. 5.)

The validity of the Draft IFIM study, upon which the Table 2 Flows were based, however, was called into question by NMFS witness Dr. Stacy Li, a water rights and instream flow specialist and the SYRTAC. Dr. Li testified that he requested a new IFIM study because of concerns that the study completed in 1989 might not necessarily be representative of the channel conditions that presently exist. (R.T., November 13, 2003, p. 960:6-960:9.) In addition, the SYRTAC rejected the Draft IFIM's conclusions because the analysis did not take into account water quality considerations. Specifically, SYRTAC contended that the IFIM's conclusions regarding usable habitat in the reach below Highway 154 is not valid because warm water temperatures would limit the actual amount of usable rearing habitat available. The SYRTAC gave three other reasons for rejecting the Draft IFIM, which are: changes to the channel since the IFIM was conducted, faulty assumptions regarding access to certain reaches, and lack of incorporation of habitat suitability criteria for steelhead in the analysis.

Instead of relying on the Draft IFIM study, the SYRTAC conducted a top width study in 1997, which evaluated the relationship between various flows and the top width (or wetted width) of the river. The average top-width under different flows was then converted to acres of habitat. (FEIR, Vol. III, Appendix C, p. 4-5.) This study was used to evaluate the amount of spawning and rearing habitat that would be available under the flows required by the 2000 Biological Opinion. As described below the Board has evaluated these water quality issues and used the SYRTAC top width study to estimate the amount of spawning and rearing habitat that would be available under the Table 2 Flows.

Temperature

During the hearing, the effect of increased flows on temperature was raised as a potential issue that could limit the habitat gains of Table 2 Flows in summer months. The available

data in the record regarding effects of water right releases on temperature are based mostly on a SYRTAC study conducted from 1993 to 1996. (MU-34.) SYRTAC studied the effects of late summer water right releases as required by Order WR 89-18. The released water had a temperature of approximately 17°C and was released at rates of 135, 70, and 50 cfs. The releases had varying effects on water temperature in the Santa Ynez River below Bradbury Dam. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-31.)

The SYRTAC study evaluated temperature criteria for rainbow trout and steelhead, specifically average daily water temperature greater than 20°C, or maximum daily temperature greater than 25°C. The study showed that average and maximum daily water temperatures, when compared to thermal tolerance indices for rainbow trout/steelhead, are within acceptable ranges at all locations downstream of Bradbury Dam during the late fall, winter, and early spring. However, during the summer months water temperatures may exceed the temperature thresholds for juvenile steelhead rearing at monitoring locations downstream from Highway 154, leading to the assertion that suitable temperatures cannot reliably be maintained in the Refugio and Alisal reaches during those months. (FEIR, Vol. II, pp. 4.7-9, 4.7-17 to 4.7-18; R.T., October 22, 2003, p. 275:18-275:21.)

During summer months, within one mile below the dam, the water right releases resulted in cooler temperatures at both surface and pool-bottom monitoring locations. (FEIR, Vol. III, Appendix D, p. 47.) This shows that increased flows can still have beneficial temperature effects even during summer months in the first reach below the dam. Effects of these water right releases on temperatures in Refugio and Alisal reaches appear less beneficial and will require additional study to determine definitively whether increased releases during particular times provide useable steelhead habitat. Information in the hearing record shows that water right releases in these reaches during summer months may result in the loss of thermal stratification within deeper pools and can increase both average and daily maximum water temperatures. (FEIR, Vol. III, Appendix D, p. 47; MU-34, p. 3-45.)

In the Refugio and Alisal reaches, during summer months, suitable temperatures may not be maintainable on a reliable basis during most years, even at flows of up to 20 cfs. (FEIR, Vol. II, pp. 4.7-17 to 4.7-18.) In both reaches, flows often become intermittent or non-existent during the summer. (*Id.*, 4.7-17.) However, cool water refuge pools have been observed in both reaches and, notwithstanding the high temperatures in these reaches, steelhead have been consistently observed during summer months under conditions of little or no surface stream flow. (FEIR, Vol. II, p. 2.0-41; MU-34, pp. xiv, 3-138, 5-22.) These thermal refuges play an important role during periods of warm temperatures for steelhead/rainbow trout rearing and may help mitigate increased temperature effects. (FEIR, Vol. II, p. 4.7-50; *id.*, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-31; MU-34, p. 3-80.) Additional study may be necessary to ensure that additional flows do not impact thermal refugia by the loss of thermal stratification, but the evidence is currently inconclusive that increased summer releases negatively impact steelhead. Finally, Alternative 5C would implement the increased Table 2 Flows only in wet and above normal years when temperature control might be possible during summer months, further minimizing the potential effects on temperature of increased summer releases. (FEIR, Vol. II, pp. 4.7-17.)

Dissolved Oxygen

Evidence related to the effects of higher flows on dissolved oxygen levels indicates that higher flows may benefit dissolved oxygen levels. Monitoring data presented in the FEIR indicates that dissolved oxygen levels decrease with distance downstream of the Highway 154 Reach. (FEIR, Vol. II, p. 4.7-9.) Santa Ynez River flows provided by Order WR 89-18 releases in 1996 had positive effects on dissolved oxygen levels. The flows provided by Order WR 89-18 releases were sufficient to remove much of the algae from pool habitats and to create sufficient turbulence and mixing to sustain higher dissolved oxygen concentrations (7 mg/l) during the critical morning hours at all of the flows tested. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-33.) On July 16, 1996, prior to initiation of releases, early morning dissolved oxygen concentrations were over 8 mg/l in the Long Pool and at mile 3.4, but were 0.2 - 4.4 mg/l in shallow pools 3.4 to 13.9 miles

downstream of Bradbury Dam.⁴⁵ (*Ibid.*) On August 2, 1996, after Order WR 89-18 releases had begun, the accumulated filamentous algal mats had been removed and early morning dissolved oxygen levels exceeded 7.45 mg/l at all sites 3.4 to 13.9 miles downstream of Bradbury Dam. (*Ibid.*)

Substrate

The Draft IFIM was used to provide an index of spawning habitat under two situations: existing substrate and improved substrate, which adds suitably sized gravel to the river. According to the Draft IFIM, with the existing substrates, 100 cfs is the optimum spawning flow. (R.T., November 12, 2003, p. 814:7-814:9.) However, with improved substrate, the optimum spawning flow is reduced to 48 cfs. (*Id.*, p. 814:10-814:12.) Mr. Keegan testified that adding additional spawning substrates would be needed to provide optimal spawning habitat with Table 2 Flows. (*Id.*, p. 814:13-814:18.) However, the necessity of additional gravel substrates was disputed in the 1999 Biological Assessment. The 1999 Biological Assessment concluded that because of high flow events in 1995 and 1998 in the Highway 154 and Refugio reaches, additional gravels were moved into the areas from Hilton Creek and other tributaries to the extent that gravel availability is no longer an issue. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, pp. 2-19, 2-21.)

Estimated Increases in Habitat Based on SYRTAC Study

Notwithstanding the issues concerning the reliability of the IFIM study that formed the basis of the Table 2 Flows and the factors that could potentially limit habitat, which were discussed above in section 5.3.3.2.2, Evaluation of Alternative 5C, evidence in the hearing record demonstrates that those flows would increase available steelhead habitat. (MU-226B, p. A-1.) Estimates of additional habitat provided in the Highway 154, Refugio, and Alisal reaches resulting from Table 2 Flows are not included in the hearing record. Therefore, State Water Board staff analyzed evidence in the hearing record to create simple and conservative estimates of the juvenile rearing and spawning habitat gains from Table 2 Flows when compared to the maximum Table 1 Flows as required by the 2000

⁴⁵ In general, dissolved oxygen concentrations less than 5 mg/l are considered unsuitable for most fish species, including both rainbow trout and steelhead (FEIR, Vol. III, Appendix C, p. 2-31.)

Biological Opinion/Alternative 3C in those three river reaches. The source material for this analysis was fully vetted through cross-examination and rebuttal during the evidentiary hearing.

To estimate the additional spawning and juvenile rearing habitat created by Table 2 Flows, State Water Board staff chose the maximum Table 1 flow rate requirement of 10 cfs as the baseline for comparison. This is a conservative baseline because this flow rate is only required in the Highway 154 reach and only when certain conditions are met. To estimate increased juvenile rearing habitat, State Water Board staff chose a flow rate of 20 cfs, the minimum Table 2 flow rate above 10 cfs. This is conservative as well because Table 2 requires flow rates at or above 20 cfs in approximately four months of the year, from February 15 until mid-June. Juvenile steelhead rear throughout the entire year and fry rear in the Santa Ynez River system from April through approximately August, so increased flow, notwithstanding the potential temperature issue discussed earlier, will increase steelhead rearing habitat. (FEIR, Vol. II, p. 4.7-45; MU-226B, p. A-1.) To estimate increased spawning habitat resulting from Table 2 flow requirements, State Water Board staff evaluated a flow rate of 50 cfs,⁴⁶ based on evidence in the record. Staff used 50 cfs as the comparison flow because 48 cfs is required from February 15 to April 14 per Table 2 as defined in the FEIR and the record provides top width measurements above 5 cfs in increments of 5. (See FEIR, Vol. II, pp. 3.0-19 to 3.0-20; MU-226B, p. A-1.) The steelhead spawning season is typically between February and April in the Santa Ynez River. (FEIR, Vol. II, p. 4.7-44; SWRCB-5, pp. 4-32 to 4-33.) The comparison resulted in an estimated minimum of four percent additional juvenile rearing habitat and 21 percent additional spawning habitat gained in the Highway 154, Refugio, and Alisal reaches.

To estimate the additional acreage of juvenile rearing habitat gained from Table 2 flow requirements compared to 2000 Biological Opinion/Alternative 3C flow requirements, State Water Board staff used the average top width of each rearing habitat type at 10 and

⁴⁶ The 48 cfs flow rate requirement in Table 2 was rounded to 50 cfs to calculate increased spawning habitat because it was the closest available flow rate with corresponding top width measurements. (MU-226B, p. A-1.)

20 cfs multiplied by the length of habitat in each of the three river reaches directly below Bradbury Dam. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 4-5.) Top width is not a complete description of habitat, but it provides an index of the amount of habitat available. (*Id.*, p. 2-35.) The primary rearing areas for juvenile steelhead are runs, pools, and glides. (MU-224, p. 3; CT-30, p 5.) Therefore, in each reach, the average distance of top width in feet for runs, pools, and glides at a flow rate of 10 cfs and 20 cfs, respectively, was multiplied by the length of habitat in feet. The March 1999 SYRTAC Report, (MU-226B, p. A-1) provided top width measurement data and the April 1999 Biological Assessment, (FEIR, Vol. III, Appendix C, 1999 Biological Assessment p. 2-20) provided the habitat length measurement data. To convert the calculated habitat into acres, State Water Board staff divided the total amount of habitat in square feet by 43,560 square feet per acre.⁴⁷ The calculation and estimated increase in steelhead rearing habitat as a result of the increased Table 2 Flows is shown in Table B– Juvenile Steelhead Rearing Habitat Improvements.

Here is an example of the calculations in Table B. At 10 cfs the average top width for runs and pools (juvenile rearing habitat) is 70 and 226 feet, respectively, in the Highway 154 Reach. The length of the run habitat is 468 feet and pool habitat is 12,481 feet. As shown in Table B, multiplying the top width (feet) and length (feet) for each habitat type, adding the results, and dividing by 43,560 square feet per acre equals the total acres of habitat at 10 cfs. The same calculation was performed to determine the amount of rearing habitat at 20 cfs.

To estimate the additional acreage of spawning habitat gains under Table 2 Flows compared to 2000 Biological Opinion/Alternative 3C flow requirements, State Water Board staff multiplied the average top width of each spawning habitat type at 10 and 50 cfs by the length of habitat in each of the three river reaches directly below Bradbury Dam. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 4-5.) The primary spawning areas for steelhead are riffles and runs. (*Ibid.*) Therefore, in each reach, the top width in feet for riffles and runs at a flow rate of 10 cfs and 50 cfs, respectively, was multiplied by

⁴⁷ One acre = 43,560 square feet.

the length of habitat in feet and then converted into acres. The calculation and estimated increase in steelhead spawning habitat is shown in Table C– Steelhead Spawning Habitat Improvements.

Table B – Steelhead Juvenile Rearing Habitat Improvements

<u>Highway 154 Reach</u>				
Flow (cfs)	Top width(feet) ⁴⁸ x length(feet) ⁴⁹			Total acres of habitat
	Runs	Pools	Glides	
10	70 x 468	226 x 12481	not sampled	65.5 acres
20	77 x 468	236 x 12481	not sampled	68.4 acres
Estimate of habitat gained by increased flows.	2.9 acres (4%) habitat			
<u>Refugio Reach</u>				
Flow (cfs)	Top width(feet) x length(feet)			Total acres of habitat
	Runs	Pools	Glides	
10	30 x 2800	89 x 2937	59 x 1494	10.0 acres
20	33 x 2800	94 x 2937	62 x 1494	10.6 acres
Estimate of habitat gained by increased flows.	0.6 acres (6%) habitat			
<u>Alisal Reach</u>				
Flow (cfs)	Top width(feet) x length(feet)			Total acres of habitat
	Runs	Pools	Glides	
10	30 x 4184	37 x 1346	52 x 3859	8.6 acres
20	35 x 4184	49 x 1346	56 x 3859	9.8 acres
Estimate of habitat gained by increased flows.	1.2 acres (14%) habitat			

⁴⁸ MU-226B, Appendix A, p. A-1 - top width measurements.

⁴⁹ FEIR, Vol. III, Appendix C, p. 2-20 – habitat length measurements.

Table C– Steelhead Spawning Habitat Improvements

<u>Highway 154 Reach</u>			
Flow (cfs)	Top width(feet) ⁵⁰ x length(feet) ⁵¹		Total acres of habitat
	Riffles	Runs	
10	69 x 3088	70 x 468	5.6 acres
50	83 x 3088	81 x 468	6.8 acres
Estimate of habitat gained by increased flows.	1.2 acres (21%) habitat		
<u>Refugio Reach</u>			
Flow (cfs)	Top width(feet) x length(feet)		Total acres of habitat
	Riffles	Runs	
10	51 x 1543	30 x 2800	3.7 acres
50	63 x 1543	37 x 2800	4.6 acres
Estimate of habitat gained by increased flows.	0.9 acres (24%) habitat		
<u>Alisal Reach</u>			
Flow (cfs)	Top width(feet) x length(feet)		Total acres of habitat
	Riffles	Runs	
10	45 x 4991	30 x 4184	8 acres
50	59 x 4991	35 x 4184	10 acres
Estimate of habitat gained by increased flows.	2 acres (25%) habitat		

In addition to the juvenile rearing and spawning habitat increases of Table 2 Flows, flows that more closely resemble natural conditions have also been shown to provide better quality habitat. Populations of steelhead respond to variable hydrologic conditions with a boom-bust cycle, with abundance increasing during and following wet years when migration, spawning, and rearing habitat expands and contracting during dry years when habitat contracts. (FEIR Vol. II, p. 2.0-29.) The steelhead community could be improved by providing more water during the wet, boom cycle which more closely reflects natural flow patterns and creates more favorable conditions for steelhead. (CT-74, pp. 6, 12-13.) Also, as CalTrout opined, the higher flows under Alternative 5C could provide better protection for steelhead by allowing the non-native predatory fish to spread out within the

⁵⁰ MU-226B, Appendix A, p. A-1 - top width measurements.

⁵¹ FEIR, Vol. III, Appendix C, p. 2-20 –habitat length measurements.

River and not be concentrated in pools with steelhead. (EDC 09/28/07 RDEIR Comment Letter.)

5.3.3.3 Water Supply Impacts of Alternatives 3C and 5C

The FEIR includes an analysis of the potential water supply impacts of the various alternatives, including 3C and 5C. (FEIR, Vol. II, pp. 4.3-1 to 4.3-30.) To determine whether the alternatives would have water supply impacts, the FEIR compared the Member Units' projected demand for water to their water supplies from all sources, including the Cachuma Project, the SWP, other surface water sources, groundwater, and recycled water. For purposes of the analysis, Cachuma Project deliveries were estimated based on SYRHM simulations for the period from 1918 to 1993. As explained in the FEIR, the principal value of the modeled output is as a tool for comparison of the alternatives, not forecasting actual drought supplies with complete accuracy. (*Id.*, p. 4.3-14.)

The analysis in the FEIR indicates that none of the alternatives would have an appreciable effect on the Member Units' water supply during wet or normal hydrologic conditions, but some of the alternatives, including Alternative 5C, could exacerbate water supply shortages during critically dry years or periods. (FEIR, Vol. II, pp. 4.3-14 to 4.3-15.) Table 4-17 of the FEIR (Member Units' Supply and Demand During Critical Drought Year (1951)) summarizes potential water supply shortages during a critically dry year, and Table 4-25a (Member Units' Supply and Demand During 3-Year Critical Drought Period (1949-1951)) summarizes potential water supply shortages during a critically dry three-year period. (*Id.*, pp. 4.3-18, 4.3-25.) As shown in those tables, the data indicate that the Member Units' water supply shortage during a critically dry year or period would be essentially the same under baseline conditions and 2000 Biological Opinion/Alternative 3C because the increased releases for fishery resources under 2000 Biological Opinion/Alternative 3C are offset by the 3.0-foot surcharge. (*Id.*, pp. 4.3-15, 4.3-18, 4.3-25.) Under both baseline conditions and Alternative 3C, the Member Units' could experience a shortage of approximately 13,000 af in a critically dry year, and approximately 28,500 af in a critically dry three-year period. (*Id.*, pp. 4.3-18, 4.3-25.)

Under Alternative 5C, the Member Units' water supply shortage in a critically dry year under the forecasted 2020/2030 demand period⁵² was projected in the FEIR to increase by 1,511 af, or approximately four percent of the total water supply, relative to 2000 Biological Opinion/Alternative 3C. (FEIR, Vol. II, p. 4.3-18.) During a three-year critical drought period, the Member Units' water supply shortage was projected in the FEIR to increase by 3,881 af compared to 2000 Biological Opinion/Alternative 3C, or approximately three percent of the total water supply, under the forecasted 2020/2030 demand period.

One of the key hearing issues was what water conservation measures could be implemented to minimize any water supply impacts of any measures that may be necessary to protect public trust resources. The FEIR includes a general discussion regarding implementation of water conservation measures by the Member Units. (FEIR, Vol. II, pp. 4.3-36 to 4.3-37.) The discussion concludes that even though the Member Units already have implemented conservation measures, it may be possible to implement additional drought contingency measures identified as part of the Member Units' urban water management plans to mitigate for a temporary water supply shortage in a critical drought year or period under Alternative 5C. Although the FEIR identified the potential to mitigate for the water supply impacts of Alternative 5C by implementing drought contingency measures, the FEIR did not quantify the amount of water that could be conserved, or conclude that implementation of drought contingency measures would be adequate to fully compensate for the potential water supply shortages under Alternative 5C.

CalTrout presented testimony and other evidence that the FEIR overestimated water supply impacts and failed to consider feasible conservation measures. Ms. Heather Cooley, Co-Director of the Water Program at the Pacific Institute and an expert witness for CalTrout, testified that the water demand projections used in the FEIR are based on outdated estimates and ignore more recent water demand projections included in the

⁵² 2020/2030 water demand means demand within the ten-year period 2020 to 2030. Water demand projections for MWD are for the year 2030; projections for SYRWCD, ID No. 1 are for the year 2025; and projections for GWD, City of Santa Barbara, and CVWD are for the year 2020. (CT-101, p. 3.)

Member Units' 2010 Urban Water Management Plans. (CT-101, p.1.) Ms. Cooley also argued that the demand projections in the FEIR fail to integrate mandated water conservation efficiency improvements, particularly a requirement to reduce per capita demand statewide by 20 percent by 2020. (R.T., March 29, 2012, pp. 83:14-84:24.)

Ms. Cooley argued further that the FEIR failed to consider:

- 1) The Member Units' ability to reduce urban demand by at least 5,000-7,000 af through cost-effective conservation;
- 2) The availability of alternative supplies, such as rainwater and recycled water; and
- 3) The potential for reducing agricultural water demand.

(CT-101; R.T., March 29, 2012, pp. 87:14-92:25.)

Ms. Cooley clarified on cross-examination that she had not conducted any studies specific to the Cachuma service area and that she did not have any specific knowledge of agricultural conservation practices or infrastructure in that area. (R.T., March 29, 2012, p. 119:10-119:18.)

Cal-Trout also provided written testimony authored by Dana Haasz and Peter Gleick, of the Pacific Institute, which provided analysis concluding that "the contractors can reduce their take of water from the Santa Ynez River without a loss of service or quality of life." (CT-50, p. 1.) According to the authors of the analysis, "[s]ubstantial water can be freed up for environmental purposes and future expected growth simply by applying existing efficiency technologies and well-understood policies to conserve water, in a cost-effective manner." (*Ibid.*) The analysis concludes that impacts to water supplies caused by alternatives that involve greater releases of water than proposed in the EIR "can also be mitigated." They estimate that "between about 5,000 and 7,000 [afa] of water can be cost-effectively conserved by programs to implement the conservation measures described in this report" and that "demand can be reduced so that the impacts of a critical dry year are considerably less severe." (*Id.*, p. 16.)

To rebut Ms. Cooley's testimony, the Member Units presented testimony and other evidence that the demand projections in the FEIR were accurate. (R.T., March 29, 2012,

pp. 128:9 to 129:16, 132:2 to 134:22.) They also testified that the demand projections take into account both plans to implement additional conservation measures to reduce per capita demand and the availability of alternative water supplies. (*Id.*, pp. 129:17 to 131:13, 133:2 to 133:22.) In addition, witnesses for the Member Units testified that per capita use within the Member Units' service areas is already well below the statewide average, and that the Member Units do not have the ability to conserve a significant amount of water by implementing additional urban water conservation measures, or by improving agricultural efficiency. (*Id.*, pp. 124:21 to 126:22, 129:7 to 131:13, 134:10-134:22, 142:8 to 150:6.)

Based on the evidence submitted by the Member Units, the FEIR's analysis of the water supply impacts of the alternatives appears to provide a reasonable upper limit estimate of the potential water supply impacts of the alternatives. In addition, Ms. Cooley's assertion that the Member Units could conserve an additional 5,000-7,000 afa of water is not consistent with the testimony submitted by Member Unit witness, Ms. Kate Rees. (MU-209; MU-238.) Ms. Rees addressed the Member Units' historical implementation of water conservation programs and practices. (MU-209.) According to the written testimony, the Member Units, all of whom are signatories to the California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California have implemented water conservation programs and practices for more than 30 years.⁵³ (*Id.*, p. 2.)

In 1995, when the Cachuma Project Water Supply Contract was renewed, Reclamation determined that all of the Member Units must implement Water Conservation Plans that meet or exceed federal standards. The City of Santa Barbara and the GWD, who together hold entitlement to approximately 70 percent of the Cachuma Project yield, have the most comprehensive water conservation programs in place among the Cachuma Member Units. (MU-209, pp. 1-2.) All other Member Units actively participate in the Santa Barbara County Water Agency's Regional Water Efficiency Program, which implements several

⁵³ As signatories to the CUWCC Memorandum of Understanding, each of the Member Units has established a water conservation program to implement the CUWCC best management practices.

water conservation best management practices on a regional level. (*Ibid.*) In conjunction with Reclamation, the Member Units ensure that they continue to meet or exceed all federal standards, including those developed in cooperation with the CUWCC.⁵⁴ (*Id.*, p. 3.) The evidence submitted by the Member Units concludes that the Member Units “have achieved a significant level of conservation within their service areas, and they are committed through both voluntary and mandatory requirements to continue this commitment into the future...”⁵⁵ (*Id.*, pp.21-22; MU-238.) Moreover, even assuming that Ms. Cooley’s testimony was correct, the conclusion that Alternative 5C could exacerbate water supply shortages in critically dry years would not change. Even so, additional water conservation efforts by the Member Units may be necessary to minimize water supply impacts in critically dry years as well as meet existing or future water conservation requirements.⁵⁶

According to Ms. Cooley, the Member Units’ projected demand should be reduced by 3,500 to 4,900 af. (CT-101, p. 3.) Based on the FEIR’s 2020/2030 demand period projections, Table 4-17 of the FEIR indicates that the Member Units’ potential water supply shortage in a critically dry year would be 12,922 af under baseline conditions, and 14,520 af under Alternative 5C. (FEIR, Vol. II, p. 4.3-18.) Even if projected demand for the period 2020/2030 was reduced by 4,900 af, a shortage of 8,022 af would remain under baseline conditions (12,922 - 4,900 = 8,022), and a shortage of 9,620 would remain under Alternative 5C (14,520 – 4,900 = 9,620).⁵⁷ Even assuming that demand could be further

⁵⁴ The Member Units’ demand management measures currently used generally conform to descriptions developed through the CUWCC, and include: Residential Water Surveys; Residential. Plumbing Retrofits; Water Audits and Repair; Meters; Landscape Conservation; Washing Machine Rebates; Public Information; School Education; Conservation for Commercial, Industrial and Institutional Users; Conservation Pricing; Conservation Coordinator; Water Waste Prohibition; and Ultra-Low Flow Toilet Replacement. (MU-209, pp. 8-10.)

⁵⁵ The Water Conservation Bill of 2009 (SBX7-7) provides the regulatory framework to support the statewide reduction in urban per capita water use described in the 20 by 2020 Water Conservation Plan. Consistent with SBX7-7, each water supplier must determine and report its existing baseline water consumption and establish future water use targets in gallons per capita per day; reporting is to begin with 2010 Urban Water Management Plans. (CT-101, pp. 3-4.)

⁵⁶ Discussion related to achieving ‘20 by 2020’ conservation requirements are discussed in extracted portions of 2010 Urban Water Conservation Plans entered into the record by CalTrout for CVWD, GWD and City of Santa Barbara. (CT-104; CT-105; CT-106.)

⁵⁷ Using the worst drought year on record (1951) for purposes of analysis, project yield under baseline operations (Alternative 2) would be 15,906 af, which represents a 38 percent shortage, and under

reduced by conserving an additional 7,000 af, a shortage under baseline conditions and Alternative 5C would remain and may require new sources of water, which could result in significant and unavoidable impacts, but these impacts should be avoided to the extent feasible by implementing conservation measures.

5.3.3.4 Water Supply Impacts of Alternative 3C and 5C with Potential Future Sources of Supply

As discussed in the FEIR, the City of Santa Barbara owns a reverse osmosis desalination plant, the Charles E. Meyer Desalination Facility, which was constructed as an emergency water supply in response to the severe drought lasting from 1986 to 1991. (FEIR, Vol II, pp. 4.3-33 to 4.3-35.) A portion of the reverse osmosis filtration capacity was subsequently sold, leaving a current capacity of 3,125 afa. (See *Id.*, p. 4.3-33.) The plant was later decommissioned after 1991 and has remained in long-term standby mode for reactivation when water demand cannot be met using all other available supplies, including extraordinary water conservation. (FEIR, Vol II, p. 4.3-33.) The City of Santa Barbara has recognized the role of desalination as a vital back-up supply for potential prolonged drought and unforeseen interruption of water supply. (*Ibid.*)

On June 4, 1991, voters elected to make desalination a permanent part of the City of Santa Barbara's water supply portfolio along with surface water from Cachuma and Gibraltar reservoirs, groundwater, State Water Project water, purchased water, recycled water, and conservation. (*Id.*, p. 4.3-8, Table 4-12.) With the approval of the Long Term Water Supply Program on July 5, 1994, the City of Santa Barbara added the desalination facility to its permanent sources of water. (*Id.*, p. 4.3-34.)

The FEIR includes information on water supply impacts to the Member Units in the event that desalination water became available in the future. (FEIR Vol II, p. 4.3-33.) Because the desalination facility was non-operational at the time, the FEIR went on to conservatively evaluate water supply impacts without desalination water as a source for

Alternative 5C would be 14,308 af, which represents 55 percent shortage relative to the desired project yield of 25,714 af. (FEIR, Vol. II, p. 4.3-17.) Assuming for the sake of argument a direct correlation between project yield and project demand, reducing project demand by 4,900 af would still produce significant shortages.

the Member Units. (See *Id.*, pp. 4.3-25, 4.3-26 (Tables 4-25a, 4-25b), pp. 4.3-18, 4.3-20 (Tables 4-17, 4-18).) This was done, in part, in response to objections received from the Member Units in comments submitted on the RDEIR regarding the potential use of the desalination facilities. (See FEIR, Vol. I, p. 2.0-318 [Response 1-20].) There is no evidence in the record as to when, specifically, the desalination plant would be able to resume operation. State Water Board staff revisited the FEIR analysis to examine the potential, hypothetical effects on water supply impacts if the desalination facility resumed operation in the future.

With an additional 3,125 afa of water during the evaluated critical drought year (1951) and three-year drought period (1949-1951), respectively, the City of Santa Barbara's adjusted water supply from sources other than Cachuma Reservoir would be 8,225 af and 25,807 af. Allowing for this adjustment, the Member Units' water supply from sources other than Cachuma Reservoir during a critical drought year (1951) and three-year drought period (1949-1951), respectively, would be 24,060 af and 73,142 af. The following adjusted FEIR Table 4-17 and Table 4-25a include the change in water supply under Alternative 5C if desalination water were available. Under Alternative 5C, the FEIR predicts that 1,598 afa would not be available to the Member Units during a critically dry year. Having an additional 3,125 afa of desalination water available would eliminate the Member Units' water supply impacts, compared to baseline conditions.

**Adjusted Table 4-17 (FEIR p. 4.3-18)
Member Units' Supply and Demand in Critical Drought Year (1951) (afa)**

	Alt 2 (Baseline Conditions under WR 89-18 and WR 94-5)	Alt 3C (Existing Operations under Biological Opinion and Settlement Agreement with 3.0' surcharge)	Alt 3C (Biological Opinion and Settlement Agreement) (with desal) Max. capacity = 3,125 afa.	Alt 5C: "3A2"/ Biological Opinion and 3' surcharge	Alt 5C: "3A2"/ Biological Opinion and 3' surcharge (with desal) Max. capacity = 3,125 afa.
1. Cachuma Project yield in a critical drought year (SYRHM simulation, Appendix F, Technical Memorandum No.5)	15,906	15,819	15,819	14,308	14,308
2. Total supply from sources other than the Cachuma Project (Table 4-18)	20,935	20,935	24,060	20,935	24,060
3. Total supply (line 1 + line 2)	36,841	36,754	39,879	35,243	38,368
4. Year 2010 demand (Table 4-19)	45,676	45,676	45,676	45,676	45,676
5. <i>Surplus(+)</i> or <i>shortage(-)</i> (line 3 – line 4)	-8,835	-8,922	-5,797	-10,433	-7,308
6. Change from Baseline (Alt.2) <i>surplus(+)</i> or <i>shortage(-)</i>	-	-87 (-1%)	+3,038 (+34%)	-1,598 (-18%)	+1,527 (+17%)
7. Year 2020/2030 demand (Table 4-19)	49,763	49,763	49,763	49,763	49,763
8. <i>Shortage (line 3 – line 7)</i>	-12,922	-13,009	-9,884	-14,520	-11,395
9. Difference from Baseline (Alt.2)	-	-87 (-0.7%)	+3,038 (+24%)	-1,598 (-12%)	+1,527 (+12%)

**Table 4-25a (FEIR p. 4.3-25)
Member Units' Supply and Demand During Critical Three-Year Drought Period
(1949–1951) (afa)**

	Alt 2 (Baseline Conditions under WR 89-18 and WR 94-5)	Alt 3C (Existing Operations under Biological Opinion and Settlement Agreement with 3.0' surcharge)	Alt 3C (Biological Opinion and Settlement Agreement) (with desal) Max. capacity = 3,125 afa.	Alt 5C: "3A2"/ Biological Opinion and 3' surcharge	Alt 5C: "3A2"/ Biological Opinion and 3' surcharge (with desal) Max. capacity = 3,125 afa.
1. Cachuma Project yield in a critical drought year (SYRHM simulation, Appendix F, Technical Memorandum No.5)	57,008	57,217	57,217	53,336	53,336
2. Total supply from sources other than the Cachuma Project (Table 4-25b)	63,767	63,767	73,142	63,767	73,142
3. Total supply (line 1 + line 2)	120,775	120,984	130,359	117,103	126,478
4. Year 2009/2010 demand (Table 4-19 * 3)	137,028	137,028	137,028	137,028	137,028
5. <i>Surplus(+)</i> or <i>shortage(-)</i> (line 3 – line 4)	-16,253	-16,044	-6,669	-19,925	-10,550
6. Change from Baseline (Alt.2) <i>surplus(+)</i> or <i>shortage(-)</i>	-	+209 (+1.3%)	+9,584 (+ 59.0%)	-3,672 (-22.6%)	+5,703 (+35%)
7. Year 2020/2030 demand (Table 4-19 * 3)	149,289	149,289	149,289	149,289	149,289
8. <i>Shortage (line 3 – line 7)</i>	-28,514	-28,305	-18,933	-32,186	-22,811
9. Change from Baseline (Alt.2) <i>surplus(+)</i> or <i>shortage(-)</i>	-	+209 (+0.73%)	+9,581 (+33.6%)	-3,672 (-12.8%)	+5,703 (+35%)

As discussed in the FEIR, concerns regarding water quality and power generation effects would be mitigable to less than significant levels. (See FEIR, Vol II, p. 4.3-35.) Water quality impacts of the discharge from the Charles E. Meyer Desalination Facility into the

ocean can be mitigated through compliance with a national pollutant discharge elimination system (NPDES) permit issued by the Regional Water Quality Control Board, Central Coast Region. (*Ibid.*) Power generation concerns regarding electricity demand and carbon footprint can be mitigated by using high-efficiency pumps, motors, and improved filter technology to reduce the plant's overall electrical power demands. (*Ibid.*)

5.3.3.5 Conclusion Regarding the Measures Necessary to Protect Steelhead

Sufficient appropriate habitat must be available and accessible in order to provide appropriate conditions for Santa Ynez River steelhead to be in good condition. A critical limiting factor in providing sufficient habitat is the construction and operation of Bradbury Dam, which limits access to habitat above the dam and limits through flow modifications the amount and quality of habitat below the dam. While implementation of the 2000 Biological Opinion/Alternative 3C has improved conditions to some extent, evidence in the record indicates that implementation of the 2000 Biological Opinion/Alternative 3C is not currently keeping steelhead in good condition and there is significant uncertainty that it will do so in the future. The 2000 Biological Opinion requirements were developed to address the risk of extinction of the fishery and to prevent adverse modifications of designated critical habitat rather than to keep fish in good condition.

As discussed above, keeping fish in good condition will require additional measures beyond what is currently being provided in the Santa Ynez River watershed. Accordingly, this order requires Reclamation to take additional actions to protect steelhead below Bradbury Dam. Specifically, this order requires Reclamation to implement Alternative 5C, which includes the requirements of the 2000 Biological Opinion, including its flows, as well as the higher Table 2 Flows in wet and above normal years. Instream flows required by this order for fish and wildlife conservation are likely to be met through some combination of bypass flows and releases from storage. Accordingly, this order amends the authorized uses for Permits 11308 and 11310 (Applications 11311 and 11322) to expressly include fish and wildlife conservation⁵⁸. Of the 11 tributary improvement projects required by the 2000 Biological Opinion/Alternative 3C, three have been

⁵⁸ The Santa Ynez River, including Lake Cachuma and tributaries (including Hilton Creek), will have a beneficial use designation of Fish and Wildlife Conservation.

completed, two were proposed for removal from the 2000 Biological Opinion, and six road crossing projects on Quiota Creek were in the design stage in December 2011 when the FEIR was completed. (FEIR, Vol. IV, Appendix G, Table 22.) The impacts of the Quiota Creek improvement projects have been evaluated at a programmatic-level under CEQA; however, they have not undergone a project-level review. (*Id.*, Vol. II, pp. 5.0-1 to 5.0-2.) COMB is the appropriate CEQA lead agency to conduct a project-level environmental review of any non-flow habitat enhancement measures that it is funding and implementing. (*Id.*, p. 5.0-1.) This order does not require completion of the tributary improvement projects on Quiota Creek.

In addition, this order requires Reclamation to expeditiously conduct studies on fish passage, instream flow, predators and other species of concern, stream and streamside habitat restoration, and complete a study plan. As discussed above, the evidence in the administrative record supports the finding that implementation of Alternative 5C will benefit the steelhead fishery by providing more habitat than that provided by the 2000 Biological Opinion/Alternative 3C. Maximizing habitat below Bradbury Dam is a necessary first step in trying to achieve good condition of the fishery.

Alternative 5C was developed to limit the water supply impacts from full implementation of Table 2 Flows. Specifically, the higher Table 2 Flows only apply for limited periods in wet and above normal years. Nonetheless, Alternative 5C may have water supply impacts during drought periods that will result in additional costs to the Cachuma Project Member Units and in potential environmental impacts associated with obtaining alternative supplies to compensate for water supply shortages. The State Water Board has considered these impacts carefully but finds that the potential minor reduction in the Member Units' water supplies that may result during drought conditions from implementation of Alternative 5C does not outweigh the potential benefits that may be achieved for the imperiled steelhead fishery in the Santa Ynez River from implementation of Alternative 5C. While the State Water Board acknowledges that additional measures are also needed to prevent extirpation of the steelhead fishery in the Santa Ynez River, the need for additional measures does not negate the need for flow improvements.

Given the likely water supply impacts of Table 2 Flows during drought periods, as well as past multi-year droughts in California and the potential for more frequent and severe drought conditions in the future,⁵⁹ Reclamation shall confer with the Member Units on necessary updates to the safe yield of the Cachuma Project.⁶⁰ The Board acknowledges that there is a need for adaptive implementation and further evaluation of the required flows to maximize protection for fishery resources, due to water temperature concerns, and to avoid water supply impacts where possible. As a result, this order allows for adaptive implementation of the flows and further monitoring, evaluation and reporting of the effects of the flows as well as a study done in accordance with Revised Section 3 of the 2000 Revised Biological Assessment, taking into consideration the 2013 Biological Assessment with any amendments, and the NMFS 2016 Draft Biological Opinion⁶¹ (within a year after the conclusion of the fifth Wet or Above Normal water year.)

Specifically, this order allows for changes to the schedule of the Table 2 Flows to respond to changing conditions in the watershed and real-time information, including information related to passage, temperature, dissolved oxygen, or other important factors. NMFS and CDFW may propose changes to the Table 2 flow schedule that will maximize the benefits of the additional releases to steelhead and other public trust resources while ensuring no water supply impacts in excess of those evaluated in the FEIR under the original schedule. Changes to the Table 2 flow schedule may be made if one or both fisheries agencies (NMFS and CDFW) have agreed to an accounting method with the Member Units and Reclamation that ensures no additional water supply impacts will occur as a result of the changes. This collaborative approach does not require the State Water

⁵⁹ In support of the reference to past multi-year drought in California and the potential for more frequent and severe periods of drought, the State Water Board takes official notice of the Proclamation of a State of Emergency due to drought conditions issued by Governor Edmund G. Brown Jr. on January 17, 2014, and Executive Order B-37-16, issued by the Governor on May 9, 2016, which declares that urban water agencies shall have urban Water Shortage Contingency Plans that include adequate actions to respond to droughts lasting at least five years, as well as more frequent and severe periods of drought. These documents are publicly available on the Office of the Governor's website.

⁶⁰ The safe yield is the amount of water a project can be expected to deliver over a sustained hydrologic period – a period that is long enough to contain wet periods as well as droughts. (FEIR, Vol. II, p.2.0-3.)

⁶¹ NMFS stated that the analyses and conclusions of the most recent 2016 draft biological opinion rely on the best scientific and commercial data available, including the most current scientific studies of Southern California steelhead, which includes the population that occurs in the Santa Ynez River. (NMFS May 28, 2019 Revised Draft Order comment letter, Attachment, p.15.)

Board's approval. However, Reclamation must notify the Board's Executive Director, who may disapprove the changes to the schedule based on information indicating that the change is not warranted. If a Member Unit or Reclamation does not agree to a proposed change to the Table 2 flow schedule, the Executive Director may require the change if the Executive Director determines that the change is warranted and that it will not cause a greater water supply impact than the impact that would occur under the existing schedule. The Executive Director shall comply with the CEQA Guidelines (California Code of Regulations, title 14, division 6, chapter 3, sections 15000–15387) when making this determination.

To safeguard against conditions that could result in adverse impacts to steelhead and other public trust resources as a result of the Table 2 Flows, this order also allows for short-term flow reductions of Table 2 Flows, including short-term reductions down to flow levels required by the 2000 Biological Opinion (Table 1 Flows). Nothing in this order shall be construed to allow the Executive Director to modify Reclamation's requirements under the ESA or the CESA.

This order allows the Director of CDFW or the Chief, Southern California Branch, California Coastal Office of NMFS to direct Reclamation to temporarily reduce or terminate the Table 2 Flows for the remainder of any given water year if the Director or Assistant Regional Administrator determines that the flows are likely to have a detrimental effect on the steelhead fishery due to high temperatures or other factors. This order authorizes the fishery agencies to direct Reclamation to temporarily reduce or terminate the flows due to the time sensitive nature of the releases and the need to react to potential issues as quickly as possible to prevent any detrimental effects to the fishery that could occur because of temperature or other factors. This is intended to be a short-term change, not to exceed the remainder of a given water year. If a situation arises that calls for a temporary reduction or termination of the flows, the Board anticipates that NMFS and/or CDFW will work closely with Reclamation on the timing and amounts of the reductions necessary. Reclamation is required to notify the Executive Director of any direction from NMFS or CDFW to reduce or terminate the Table 2 Flows. The Executive

Director has the authority to disapprove the reduction or termination if the Executive Director disagrees with the determination that the flows will harm the fishery.

5.3.3.6 Additional Studies and Study Plan

In light of the lack of recovery of steelhead and public trust resources in the Santa Ynez River since the 2000 Biological Opinion/Alternative 3C was implemented, the testimony from the fishery agencies identifying additional actions that are needed to protect steelhead, and an incomplete hearing record on those actions, this order requires Reclamation to complete studies sufficient to determine the measures necessary to maintain the steelhead population in good condition. The Board may require Reclamation to implement additional measures needed to keep steelhead in good condition based on the results of those studies, if the Board determines, after providing notice and an opportunity for a hearing to affected parties, that the measures are consistent with the public trust and reasonable use doctrines. (See Cal. Code of Regs., tit. 23, § 780, subd. (a).) There is sufficient information in the record to determine that Table 2 flows are necessary in the interim.

To inform implementation of the higher Table 2 Flows included in Alternative 5C and the various adaptive provisions provided by this order discussed above, as well as potential future changes to Reclamation's water right requirements for the Cachuma Project, this order requires Reclamation to evaluate the following over five wet or above normal water years:

- 1) The effects of Table 2 Flows on steelhead in the river and verification of the amount of additional habitat provided, including habitat below the Alisal Reach;
- 2) The quality of the additional habitat, taking into account temperature, dissolved oxygen, and substrate;
- 3) Any detrimental effects, demonstrated by clear, scientific evidence, to steelhead in the river caused by the additional flows, such as increased temperature; and
- 4) Whether benefits to the steelhead fishery could be maximized through an alternative flow schedule with equivalent or reduced water supply impacts.

This order requires Reclamation to conduct the study in accordance with the requirements and methodologies in Revised Section 3 of the 2000 Biological Assessment taking into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion so comparable data will be available to evaluate the changes resulting from the flow regime. Further, the order requires Reclamation to submit the results of the study within a year after the conclusion of the fifth Wet or Above Normal water year. The order reserves the Board's authority to reduce or modify the Table 2 flow requirements if the results of the study demonstrate that the additional releases do not benefit the steelhead fishery or if greater than expected water supply impacts occur.

In addition to the requirement to study the Table 2 Flows, this order requires Reclamation to conduct studies to determine other measures that could be implemented to keep the steelhead fishery in good condition using current scientific information on southern California steelhead recovery such as NMFS' 2012 Final Southern California Steelhead Recovery Plan, 2013 Biological Assessment with any amendments, and 2016 Draft Biological Opinion and to provide reports to the Board and fisheries agencies following completion of those studies. Specifically, this order requires Reclamation to evaluate: opportunities to provide passage of steelhead above and below Bradbury Dam; instream flow measures for the protection of steelhead and other native aquatic species in the Santa Ynez River; measures to reduce impacts of predation and other species on steelhead and other native aquatic species; and improvements to or restoration of stream and streamside habitat to benefit steelhead and other native aquatic species. In each study, Reclamation is required to evaluate the extent to which the measures could benefit the steelhead and other public trust resources, technical and regulatory feasibility, costs, and any potential water supply or environmental impacts. This order requires Reclamation to submit a report to the Executive Director after the completion of each study that describes the study and its results. Reclamation must also submit a summary report one year after completion of all required studies identifying specific measures that Reclamation will implement or that could be implemented to achieve good condition of the steelhead population in the Santa Ynez River.

This order requires Reclamation to prepare an overall study plan for the studies described above, including the sequence in which Reclamation proposes to complete the studies and deadlines for submitting reports that describe the studies and their results. For all draft and final plans, studies, and reports, Reclamation is required to consult with CDFW and NMFS. Each of the studies is described in more detail below.

Passage Study

During the hearing, the fisheries agencies presented substantial evidence regarding the importance of passage around Bradbury Dam to the recovery of the steelhead population. Steelhead evolved having access to the Santa Ynez River headwaters above Bradbury Dam. (R.T., October 23, 2003, p. 548:13-548:14.) Historically, steelhead used the mainstem of the Santa Ynez River as a migration corridor to reach the tributaries above Bradbury Dam to spawn and rear in the summer. (*Id.*, p. 548:20-548:24.) As stated earlier, upstream of Bradbury Dam, there are 248 miles of habitat in the tributaries, and 43 miles of habitat in the river main-stem. (NOAA-7A, NOAA-7B, NOAA-7C.) Historically, steelhead over-summered in these upper reaches, where water temperature and dissolved oxygen levels are consistently more favorable, when water temperatures in the mainstem became unfavorable or flow was nonexistent. (R.T. October 23, 2003, pp. 583:24 to 584:10; FEIR, Vol. II, p. 4.7-22.) After construction of Bradbury Dam all of this favorable upstream habitat was blocked. Experts from the fishery agencies testified that the lower Santa Ynez River will not support a robust population of steelhead and that passage to these upstream reaches is necessary for recovery of the steelhead population. (DFG-4, p. 7; R.T., March 30, 2012, p. 18:1-18:8; R.T., October 23, 2003, p. 554:7-554:13; R.T., November 12, 2003, p. 748:3-748:11.) Based on this evidence, this order requires Reclamation to study, as expeditiously as possible, the feasibility of providing passage upstream and downstream of Bradbury Dam. The study is required to conform to the *Santa Ynez River Fish Passage Feasibility Analysis* submitted by NMFS (on February 16, 2004) and CDFW (February 17, 2004) unless variations are approved by the Deputy Director.

Instream Flow Study

Passage alone may not address all of the impacts of the construction and operations of Bradbury Dam. In addition, the habitat below Bradbury Dam will need to be improved to the extent feasible, particularly given that the degree to which passage will be possible is not certain. IFIM analysis is a standard method for determining instream flow needs for fish and wildlife. (R.T., November 13, 2003, p. 921:2-921:6.) As mentioned previously, DWR completed a draft IFIM for the Santa Ynez River in 1989. However, that study may not be representative of the channel conditions that currently exist (*id.*, p. 960:6-960:9; CT-37) and the recommendations of the 1989 draft IFIM are uncertain since it was never finalized. Additionally, an IFIM study is not specifically intended to address aspects of river flow which are pertinent to anadromous fish. As noted in NMFS December 8, 2016 comment letter, an IFIM deals primarily with water conditions important to sustaining an existing standing crop of fish residing in a river or stream, but does not specifically address the flows necessary to induce or facilitate migration of fish, either from or to the ocean. This aspect of a flow regime is particularly important for highly migratory fish species such as steelhead. Specially, IFIM analyses do not promote the elements of the natural flow regime which are important to maintaining native species, including steelhead, life history diversity and habitat conditions under which these species have evolved. (NMFS, December 8, 2016 comment letter, p. 15.)

For these reasons, this order directs Reclamation to further study what flows and other non-flow measures are necessary to restore and maintain the steelhead population in good condition at the individual, population, and community level. The study must evaluate steelhead life history and habitat requirements including channel morphology and water quality issues, including but not limited to sediment transport, temperature, and dissolved oxygen conditions. (See generally R.T., November 12, 2003, pp. 655:7-658:3.)

Studies to Evaluate the Effects of Predation and Other Nonnative Species

Ms. Baldrige testified that native fish populations such as steelhead may never be in good condition at the community level in the Santa Ynez River due to predation by invasive fish species and the favorable habitat conditions for these invasive species in

the Santa Ynez River. (R.T., October 22, 2003, p. 447:12-447:17.) In addition to nonnatives, Ms. Baldrige also testified that native beaver and their dams may create impediments to fish passage. (MU-226, p. 6.) To further evaluate these issues and potential methods to address them, this order requires Reclamation to study the effects of predation and other species on steelhead and to evaluate measures that could be implemented to reduce impacts.

Stream and Streamside Habitat Restoration

Reclamation proposed in the 1999 Biological Assessment to implement physical habitat improvement projects, including the removal of fish passage barriers on the tributaries to the Santa Ynez River, to be completed by 2005. Of the 11 tributary improvement projects required by the 2000 Biological Opinion, only three were completed, and two were eliminated. Providing additional improvements in streamside habitat such as increasing the amount of riparian vegetation should improve temperature, dissolved oxygen, and food productivity, which in turn may provide significant benefits to steelhead and other public trust resources, particularly in the summer. As stated in section 5.3.3.1.3, this order will not require the completion of the remaining tributary improvement projects on Quiota Creek. However, this order directs Reclamation to conduct a study that evaluates the potential for other stream and streamside restoration and habitat improvements to improve the quantity and quality of steelhead habitat in the lower Santa Ynez watershed.

Study Plan

This order requires Reclamation to prepare a study plan for the studies described above. The study plan must specify the metrics that will be used to define what would constitute good condition of the steelhead fishery in the Santa Ynez River at the population and community levels. Two possible metrics are: population size for each of the different steelhead life stages that would equate to good condition, or the amount of adequate and accessible habitat that would support a steelhead population in good condition. The study plan also must include the sequence in which Reclamation proposes to complete the studies (concurrently or in coordination with other studies) and the proposed deadlines for submitting reports that describe the studies and their results. The study plan must

also take into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion. Upon written agreement by CDFW and NMFS, existing studies may be used to fulfill the requirements in this section. Reclamation is required to submit the study plan to the Deputy Director for review within 180 days from the date of this order. The Deputy Director may direct Reclamation to make any changes to the study plan necessary to ensure a timely and meaningful evaluation of the measures.

5.3.3.7 *Monitoring and Reporting*

This order requires Reclamation to maintain a continuous record of the daily instream flows in the Santa Ynez River at Highway 154 and Alisal Road, or other sites the Deputy Director deems suitable and to make those records available on a publicly assessable website.

This order requires Reclamation to implement the monitoring program described in the 2000 Biological Assessment, taking into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion, to evaluate steelhead and their habitat. And the order also directs Reclamation to consider including additional monitoring aimed at measuring progress toward recovery of California's steelhead populations, such the California Coastal Salmonid Monitoring Plan. Reclamation must implement the monitoring program regardless of which flow requirements are in effect. The Deputy Director may amend the monitoring requirements to require additional monitoring or refine existing requirements.

This order also requires Reclamation to submit annual reports to verify compliance with all permit terms, and to submit annually the document produced in accordance with the terms and conditions that implement Reasonable and Prudent Measure No. 11 of the 2000 Biological Opinion. (FEIR, Vol. III, Appendix D. pp. 75-77.) Furthermore, if Reclamation anticipates a violation or if a violation of any of the terms or conditions in this order has occurred, Reclamation shall provide immediate written notification to the Deputy Director. Finally, within 90 days from the date of this order, Reclamation will be required to submit a plan describing the measures in place or those it will implement with specific time periods that will ensure compliance with the flow requirements. The Deputy

Director may direct Reclamation to make any changes to the plan necessary to ensure compliance.

6.0 PROTECTION OF DOWNSTREAM WATER RIGHTS

One of the primary objectives of this proceeding is to protect senior downstream water rights holders from injury due to:

- 1) Changes in water quality resulting from operation of the Cachuma Project, including water quality effects in the Lompoc Plain Groundwater Basin that impair any senior water right holder's ability to beneficially use water under prior rights; and
- 2) A reduction in the quantity of water available to serve prior rights.

This section will review the Cachuma Project Settlement Agreement, discuss how the settlement agreement applies to key hearing issues, and make findings.

6.1 Cachuma Project Settlement Agreement

Cachuma Project operations caused nearly fifty years of dispute between the Member Units and the downstream parties (the City of Lompoc and SYRWCD). The December 17, 2002 Settlement Agreement between the CCRB; SYRWCD; SYRWCD, ID No. 1; and the City of Lompoc was executed by the parties to resolve all outstanding water rights and water quality issues among them, including key hearing issues 4, 5, and 6. (MU-220; MU-220A.)

The Settlement Agreement includes five basic provisions:

- 1) Downstream water rights releases;
- 2) Modified winter storm operations;⁶²

⁶² During February 1998, the historic operation of Bradbury Dam (Cachuma Reservoir) changed during two large storm events to reduce downstream flow in the Santa Ynez River. The success of that operation in reducing public risk prompted the staff of Santa Barbara County Water Agency to summarize the basis for those operations so that such operations may be repeated as conditions warrant. Risk to the yield of the reservoir was also evaluated since the Cachuma Project was authorized for water conservation and was not formally authorized for flood control purposes and thus has no space dedicated to flood control. (CSB-8, p. 1.) The parties to the Settlement Agreement agreed to Reclamation's

- 3) Resolution of litigation and claims by City of Lompoc;
- 4) Protection of public trust resources;⁶³ and
- 5) Effective date and termination.

Provision 1 is subdivided into six subparagraphs: 1.1, 1.2, 1.3, 1.4, 1.5, and 1.6. Of these five basic provisions, most do not require action by the State Water Board to implement and can be carried out under existing Board orders or under contractual commitments among the parties. Only subparagraphs 1.3 and 1.4 of the Settlement Agreement require action by the State Water Board to fully implement and are discussed in detail below. (MU-220; MU-220A.)

6.2 Key Issue 4 Evaluation

The following discussion evaluates how the Settlement Agreement addresses Key Hearing Issue 4:

Has any senior, legal user of water been injured due to changes in water quality resulting from operation of the Cachuma Project?

The City of Lompoc owns and operates nine domestic water supply wells that are all located within the boundaries of the City of Lompoc and withdraws groundwater from the main zone of the upper aquifer in the eastern portion of the Lompoc Plain Groundwater Basin. The groundwater from the wells is the City of Lompoc's sole source of water provided to approximately 39,000 people within the Santa Ynez River watershed. (Lompoc-1.)

The City of Lompoc has asserted that the historic operations of the Cachuma Project impaired the water quality in the Lompoc Plain Groundwater Basin in such a manner as to injure the city's senior downstream water rights. (Lompoc-1, p. 6.) The City of Lompoc

adoption and continued use of "Modified Winter Storm Operations" as described in technical memoranda cited in the Settlement Agreement, to help protect life and property along the Santa Ynez River downstream of Bradbury Dam. The Modified Winter Storm Operations provide Lompoc and its residents, as well as other entities and individuals downstream of Bradbury Dam, a level of protection and security from major flooding that did not exist before 1998. (Lompoc-1, p. 2; MU-220A, p. 6.)

⁶³ The parties to the Settlement Agreement agreed to mutually support the Terms and Conditions of the NMFS 2000 Biological Opinion and the Fish Management Plan as the preferred operational program for the Cachuma Project to address public trust resource issues. (MU-220A, p. 7.)

has argued that the historical operation of the Cachuma Project increased the salinity of Santa Ynez River stream flows at the Narrows in two significant ways:

- 1) Evaporation from the reservoir surface increases the dissolved solids concentration in the outflow; and
- 2) Deliveries to the South Coast through Tecolote Tunnel and deliveries to SYRWCD, ID No. 1 through the dam's outlet works decrease the average outflow from the reservoir, which increases the relative contribution of tributary inflows between Bradbury Dam and the Narrows to the total flow at the Narrows.

(Lompoc-1, p. 6.)

Modeling conducted by the City of Lompoc's consulting hydrologist, Mr. Tim Durbin, principal groundwater and surface-water hydrologist, showed that historically, the operation of the Cachuma Project significantly reduced the quality of groundwater in the eastern Lompoc Plain Groundwater Basin. The dissolved solids and salinity concentrations of the recharge water in the Lompoc Plain Groundwater Basin are determined primarily by the dissolved solids and salinity concentrations at the Narrows.⁶⁴

(Lompoc-1, p. 6.)

6.2.1 Operation Under the Settlement Agreement

Pursuant to Provision 1 (Subparagraph 1.5 - Deliveries During Releases) of the Settlement Agreement, the parties to the Settlement Agreement agree that deliveries of SWP water characterized by low concentrations of TDS will be scheduled such that deliveries will be maximized during periods of Order WR 89-18 water rights releases, consistent with contractual limitations and the limitations in the 2000 Biological Opinion.⁶⁵ The objective of such co-mingling operations is to lower the TDS of water right releases for the lower Santa Ynez River downstream of Bradbury Dam. (MU-220; MU-220A, pp. 5-6.) This provision is a key component of resolving water quality concerns that the City of Lompoc raised concerning Cachuma Project operations. This provision of the

⁶⁴ Salinity is determined by measuring the ability of water to conduct an electrical current. Salinity is expressed in two different ways, either as electrical conductivity (ECw) or Total Dissolved Solids (TDS).

⁶⁵ The 2000 Biological Opinion limits the amount of SWP water that can be "mixed" to no more than 50 percent of the release. (MU-220, p. 6.) The FEIR summarizes other restrictions related to the delivery of SWP water. (Vol. II., p. 2.0-38.)

Settlement Agreement can be implemented without any modification of existing Board orders. (MU-220, p. 5.)

Modeling conducted by the City of Lompoc's consultants supports the conclusion that under the current operating regime of the 2000 Biological Opinion, which includes the downstream water rights releases as required in Order WR. 89-18 and the commingling of SWP water that is imported by the CCWA, the groundwater quality in the eastern portion of the Lompoc Plain Groundwater Basin will return to a no project condition, and should ensure that the Cachuma Project does not impair the City of Lompoc's senior groundwater rights. (Lompoc-1, p. 7-8.)

6.3 Key Issue 5 Evaluation

The following discussion evaluates how the Settlement Agreement addresses Key Issue 5:

Has operation of the Cachuma Project injured any senior water right holders through reduction in the quantity of water available to serve prior rights and, if so, to what extent?

Surface water supplies potentially available in the Santa Ynez River watershed include the main stem and tributaries of the Santa Ynez River and imported water from Northern California through the SWP. Diversion works constructed on the river (i.e., Juncal Reservoir (Jameson Dam), Gibraltar Dam (Gibraltar Reservoir), and Bradbury Dam (Cachuma Reservoir) were designed to export all or most of the diverted water out of the watershed. Surface water exports have the potential to significantly affect groundwater recharge. For this reason, the State Water Board included conditions in Decision 886, and Orders WR 73-37, WR 78-10 and WR 89-18, to mitigate for the potential impacts of the Cachuma Project on groundwater recharge.

According to expert testimony presented by Mr. Durbin, groundwater flow modeling indicates the historical operation of the Cachuma Reservoir has had little, if any, impact on the groundwater supply within the Lompoc Plain Groundwater Basin. According to Mr. Durbin, the reservoir's operational impact, if any, has been to increase the water supply availability during extended droughts. (Lompoc-3, p. 2.) Mr. Durbin concluded

that, “the continuation of the current operating regime under Order 89-18, including the CCWA’s commingling of water from the SWP, as provided for in the Settlement Agreement, should insure that the Cachuma Project does not impair Lompoc’s senior groundwater rights.” (*Id.*, p. 3.)

6.3.1 Provision 1 – Subparagraph 1.3 - Conjunctive Operation of the BNA

The parties to the Settlement Agreement have agreed to operate the BNA conjunctively with the Lompoc Plain Groundwater Basin. Condition 5 of Reclamation’s Permits for the Cachuma Project requires the BNA to be maintained for the benefit of water users in the Lompoc Plain Groundwater Basin. Pursuant to Condition 5, some of the water stored in Cachuma Reservoir is credited to the BNA and later released and conveyed to the Narrows for purposes of groundwater recharge. Credits to the BNA are based on the difference between actual percolation below the Narrows and the estimated percolation that would have occurred if river flows were not impounded by Cachuma Reservoir. Reclamation calculates monthly “constructive” flows and percolation, and estimates the difference between actual and constructive percolation using two percolation curves. (FEIR, Vol. II, p. 2.0-9.) The two curves reflect different flow-percolation relationships based on groundwater levels in the Lompoc Plain Groundwater Basin. (*Ibid.*) Curve A has been used by Reclamation and provides a higher rate of credit accrual in the BNA than Curve B. (*Ibid.*)

For many years, a disagreement existed between Reclamation, the Member Units, the SYRWCD, and the City of Lompoc, as to the “trigger” or “triggers” to be used to switch from “Curve A” to “Curve B” for purposes of determining BNA credits as provided in Condition 5 of the Cachuma Project Permits. (MU-220, p. 8.) The parties to the Settlement Agreement have agreed that Curve A should be used for purposes of establishing BNA credits rather than Curve B, but that a portion of the BNA credit should be allocated for the Member Units’ use during dry year conditions. (*Id.*, pp. 8-10; MU-220A, p. 5; MU-220E.)

The parties to the Settlement Agreement view this compromise as a mutually beneficial solution. (DOI-5, p. 1; Solvang-1, p. 2; Lompoc-1, p. 2; SYRWCD-2, p. 3.) For the

Lompoc Plain area, credits will continue to be determined based on Curve A and therefore sufficient supplies will be available for downstream users, as compared to the supplies that would be available if Curve B were employed. On the other hand, the Member Units also will be able to accumulate, during high flow years, a portion of the BNA credit for use during very dry years when it is needed most by the Member Units.

Similarly, the record does not contain any evidence that the continued operation of the Cachuma Project in accordance with the Settlement Agreement will result in any significant effect on the Above Narrows Alluvial Groundwater Basin. The Settlement Agreement is supported by the Cities of Solvang, Buellton, and Lompoc, all of which are located within SYRWCD.⁶⁶ (Solvang-1, p. 2; SYRWCD-2.) The SYRWCD “wholeheartedly support[s] the Settlement Agreement as the appropriate means to protect the downstream water rights interests....” (SYRWCD-2, p. 2.) According to testimony by SYRWCD’s witness, Dr. Bruce A. Wales, General Manager, “it is essential that the State Water Board make the relatively minor revisions to WR 89-18 required to provide for downstream water rights releases under WR 89-18 as modified by the Settlement Agreement.” (*Id.* p. 1.) Dr. Wales also stated that the Board of Directors of the SYRWCD and its landowners or residents request that the State Water Board “adopt WR 89-18 as amended by the Settlement Agreement....” (*Id.*, p. 2.)

6.4 Key Issue 6 Evaluation

The following discussion evaluates how the Settlement Agreement addresses Key Issue 6:

Should Reclamation’s water right permits be modified in accordance with the Settlement Agreement Between Cachuma Conservation Release Board, Santa Ynez River Water Conservation District, Santa Ynez River Water Conservation District, Improvement District No. 1, and the City of Lompoc Relating to the Operation of the Cachuma Project? Specifically, should Reclamation’s water right permits be modified in accordance with the two enclosures submitted to the [Board] by Reclamation under cover of letter dated February 26, 2003, entitled “Proposed Modifications to WR 73-37 as amended by WR 89-18 Pertaining to Permits 11308

⁶⁶ Groundwater occurs within the SYRWCD primarily from the younger alluvial deposits of the Santa Ynez River and Lompoc Plain. Groundwater production within the SYRWCD is for domestic, municipal, industrial, and agricultural purposes.

and 11310 (Applications 11331 and 11332)” and “Revised USBR Exhibit 1, February 1, 2003”?

6.4.1 Provision 1 – Subparagraph 1.4 - Technical Amendments to Permits 11308 and 11310

Pursuant to subparagraph 1.4 of the Settlement Agreement, the parties have agreed to support “technical amendments” to Conditions 5 and 6 of the Permits. The technical amendments are set forth in Exhibit C to the Settlement Agreement. (MU-220A, Exhibit C.)

As discussed above, Condition 5 of the Permits establishes the BNA. Condition 5 also establishes the ANA for the benefit of downstream water users between Bradbury Dam and the Lompoc Narrows. Water is credited to the ANA and later released to replenish the groundwater basin in the Above Narrows area. Inflow into Cachuma Reservoir is credited to the ANA when there is no visible flow (live stream) at designated locations in the river from Bradbury Dam to Floradale Avenue in the Lompoc Valley. Condition 6 of the Permits requires Reclamation to conduct field investigations and studies, and install necessary measuring facilities, to determine the amount, timing, and rates of releases of water into the Santa Ynez River below Bradbury Dam that are required pursuant to Condition 5.

For all of the provisions of the Settlement Agreement to become effective, the State Water Board must make the technical amendments to Conditions 5 and 6 of the Permits, in accordance with the Settlement Agreement. (MU-220A, p. 7.) Specifically, the Settlement Agreement provides that subparagraphs 1.2 (Conjunctive Operation with Fish Releases),⁶⁷ 1.3 (Conjunctive Operation of the BNA), and 1.4 (Technical Amendments to WR 89-18) shall not become effective until the State Water Board adopts an order amending the terms and conditions of Reclamation’s Permits confirming that downstream water rights releases will continue to be made consistent with Order WR 89-18, as modified by the technical amendments enumerated in Exhibit C of the agreement, without

⁶⁷ The parties to the Settlement Agreement agreed that downstream water rights releases will be scheduled in a manner to ensure that such water right releases in the future are similar to the historical practices, so that these releases operate conjunctively with the releases required to meet rearing flows described in the 2000 Biological Opinion. (MU-220A, p. 3.)

any material change. (*Ibid.*) In addition, the agreement may be terminated if the State Water Board does not adopt an order amending the terms and conditions of Reclamation's Permits in accordance with the agreement. (*Id.*, pp. 7-8.)

Although Reclamation is not a signatory to the Settlement Agreement, Reclamation supports the agreement, and has agreed to the technical amendments proposed by the parties to the agreement. (DOI-5, p. 11; DOI-10.) By letter dated March 21, 2003, Reclamation submitted two enclosures that set forth proposed modifications to its Permits consistent with the technical amendments proposed by the Settlement Agreement.⁶⁸ (DOI-10; Staff Exhibit 12.) Enclosure 1 is entitled "Proposed Modifications to Order WR 73-37, as amended by Order WR 89-18, Pertaining to Permits 11308 and 11310 (Applications 11331 and 11332)" and Enclosure 2 is entitled "Revised USBR Exhibit 1, February 1, 2003." Enclosure 2 contains technical information incorporated by reference in Conditions 5 and 6 of the Permits.

The technical amendments fall into three general categories, identified in Exhibit C to the Settlement Agreement as Technical Amendment 1, 2, and 3. These changes generally provide for:

- 1) An alternative measurement location for the "live-stream" determination at San Lucas Bridge (Highway 154) for purposes of determining credits to the ANA, in light of fish water releases that have been routinely made and have been present at that location since 1993;
- 2) Implementation of the conjunctive operation of the BNA and the application of Curve A and Curve B in determining BNA credits; and
- 3) Additional measurements to be carried out with respect to deliveries of SWP water.

(MU-220A, Exhibit C.)

6.4.1.1 Technical Amendment 1

This amendment sets the measuring location for the "live-stream" determination for the purposes of determining credits to the ANA. Since 1993, Cachuma Reservoir has

⁶⁸ Key hearing issue 6 incorrectly states that the enclosures were submitted by letter dated February 26, 2003.

released water to study and maintain fish habitat in the upper part of the Santa Ynez River downstream of Bradbury Dam. As a result of the releases, live stream flow conditions attributed to regular releases from Bradbury Dam have been created in the Santa Ynez River at San Lucas Bridge (Highway 154 Bridge) and at Floradale Avenue (Lompoc Narrows). (MU-220, p. 11; MU-220A, Exhibit C, pp. 1-3.) Accordingly, Reclamation has been making live-stream observations near the Highway 154 crossing on San Lucas Creek. San Lucas Creek is the main tributary to the Santa Ynez River immediately upstream of the San Lucas Bridge (Highway 154 Crossing) and the parties consider it the appropriate location to make the live-stream observations required by Condition 5. (MU-220, p. 11; MU-220A, Exhibit C, pp. 1-3; see also DOI-10, Enclosure 1, Enclosure 2, Attachment H, p. 2.)

6.4.1.2 Technical Amendment 2

This amendment addresses the implementation of the conjunctive operation of the BNA as described in section 6.3.1, above. The conjunctive operation with the BNA continues the use of Curve A for the purposes of establishing BNA credits, but under certain conditions sets aside a portion of the BNA credits for the Cachuma Member Units to utilize when most needed during dry conditions. (MU-220A, Exhibit C, p. 4; see also DOI-10, Enclosure 1, Enclosure 2, Attachments E & F.)

6.4.1.3 Technical Amendment 3

Since the State Water Board last revised Reclamation's Permits in 1989, additional flow and water quality measurement devices have been installed and maintained by the U.S. Geological Survey. By letter dated March 21, 2003, Reclamation submitted its request to the State Water Board that these additional measurement devices be reflected by updating Condition 6 of its Permits and USBR Exhibit 1. (DOI-10.) Enclosed with Reclamation's letter are the proposed modifications to the terms and conditions in Permits 11308 and 11310, determined by the parties to the Settlement Agreement and agreed to by Reclamation to be necessary to protect water rights on the Santa Ynez River, downstream of Bradbury Dam. These technical amendments, as well as related changes for Technical Amendments 1 and 2, are consistent with those technical amendments set forth at Exhibit C of the Settlement Agreement. (DOI-10, p. 2; MU 220a, sec. 1.4, p. 5;

see Exhibit C, Page 5.) Technical Amendment 3 concerns the measurement of the delivery of SWP water into Cachuma Reservoir. Consistent with the measurements performed for the SWP deliveries, the parties have agreed to, and Reclamation has proposed, two technical amendments to Condition 6 of the Permits. (MU-220A, Exhibit C, p. 5; see also DOI-10, Enclosure 1.)

6.5 Finding Regarding Protection of Downstream Water Rights Pursuant to the Settlement Agreement

The record supports the conclusion that operation of the Cachuma Project in accordance with the Settlement Agreement will protect senior downstream water right holders from injury due to either changes in water quality or a reduction in the quantity of water available to serve prior rights. The Settlement Agreement resolved long-standing water right and water quality issues between the Member Units, SYRWCD, and the City of Lompoc, and is supported by Reclamation. Following review, analysis, discussion, and negotiation, Reclamation and the parties also agree that the State Water Board should adopt the technical amendments described above.

Therefore, the State Water Board finds that Reclamation should operate the Cachuma Project pursuant to the new accounting, monitoring, and operating procedure set forth in the Settlement Agreement, and the Permits should be amended as proposed by Reclamation and agreed to by the parties to the agreement. The Board recognizes, however, that the Settlement Agreement was predicated on the assumption that the terms of the 2000 Biological Opinion/Alternative 3C would be adequate to protect public trust resources. As such, accounting methodologies for the ANA and BNA may need to be adjusted again in light of implementation of the higher fish flows called for by this order.

Condition 7 of the Permits required the Board to commence a hearing by December 1, 2000, concerning proper and adequate releases from Bradbury Dam for downstream use and groundwater recharge. Condition 7 also reserved authority to amend the Permits until long-term permit conditions were set to protect downstream water right holders. This order updates condition 7 to reserve authority to make any changes to the release

requirements for downstream water rights that may be necessary based on any changes to the Settlement Agreement.

7.0 Change Petition

7.1 Evaluation of Change Petition

As described in section 2.3, Reclamation filed a petition to change the place of use and purposes of use for its Permits. The proposed change in the authorized place of use for the Cachuma Project is to make the existing place of use boundary coincident with the Cachuma Project Member Units' water service area boundaries.⁶⁹ (MU-2, p. 1; DOI-1, p. 4.) The Member Units have integrated distribution systems that commingle Cachuma Project water with their other separate water sources. (MU-2, p. 2.) Evidence of intent to serve water to lands presently excluded from the permitted place of use is the Goleta West and Solvang-Santa Ynez Conduits, which are part of the integrated delivery system and part of the original design for the Cachuma Project. (*Ibid.*) Additional evidence includes the area outside the City of Santa Barbara's authorized place of use, which has been part of the City's water service area since the 1910s and 1920s. (*Ibid.*)

Reclamation's petition also seeks to consolidate the purposes of use for its Permits so that both Permits authorize the following purposes of use: irrigation, municipal, industrial, domestic, salinity control, incidental recreation, and stock watering. (DOI-2b; DOI-4, p. 4.) The requested change to the purposes of use is to consolidate the purposes of the two water right permits to make them consistent and uniform with one another. This is an administrative action that will not result in any change to Project operations, nor will it increase the amount of water that can be diverted from the Cachuma Project. (*Ibid.*)

7.2 Evaluation of Protest by City of Lompoc

As discussed under section 6.2, the City of Lompoc owns and operates nine domestic water supply wells that are all located within its service area and withdraws groundwater

⁶⁹ Under this petition, Reclamation sought to increase the place of use under both Permits from a gross area of 175,000 acres. (DOI-2b.) The proposed modified place of use includes an additional 17,506 acres near Santa Barbara and Lake Cachuma.

from the main zone of the upper aquifer in the eastern portion of the Lompoc Plain to serve approximately 39,000 people within the Santa Ynez River watershed. (Lompoc-1.) However, pursuant to the Settlement Agreement's Provision 3 (*Resolution of Litigation and Claims by City of Lompoc*), the City of Lompoc has:

- 1) Waived and forever discharged Reclamation and the parties to the Settlement Agreement from all of its existing financial damage claims relative to impacts of the operation of the Cachuma Project upon the City of Lompoc's water rights and upon water quality in the Lompoc Plain Groundwater Basin, and
- 2) Withdrawn its protest to the Cachuma Project Petition to Change in Place and Purpose of Use in connection with Phase 1 of the Order WR 94-5 water right hearing.

(MU-220A, p.7)

While the Cachuma Project was originally designed and authorized with a safe yield of approximately 32,000 acre-feet per year, that amount has diminished over the many years to approximately 25,700 acre-feet per year due to siltation in the reservoir and use of a longer hydrologic period that incorporates a key drought period, 1946-51. (DOI-1, p. 5; FEIR, Vol. II, p. 2.0-3.) The safe yield is that amount of water that can reasonably and beneficially be used each year by the Member Units and still ensure water is available in drought years. The 1996 Master Contract (Contract No. I75r-1802R) between Santa Barbara County Water Agency and Reclamation is a water service contract that states that "...due to the reduced capacity of Cachuma Reservoir, the sustained annual yield of the Cachuma Project has been reduced to approximately 25,700 acre-feet..." to be delivered to the five Member Units. (DOI-1c, p. 5.) The Cachuma Project provides only about 65 percent of the total water supply of the Member Units, and is not sufficient to meet demand even within the existing place of use. (MU-2, p.1.) The Master Contract states that the parties agree that the Cachuma Project shall continue to be operated to provide for the protection of prior downstream rights holders and public trust resources. (DOI-1, p. 5.) The Member Units submit an annual water schedule to Reclamation for review and approval each year. (*Ibid.*)

The Member Units testified that they contract for a maximum entitlement of water from the Cachuma Project, and no additional or greater amount of water would or can be made

available as a result of a change in the authorized place of use. (MU-2, p. 8.) Member Units' witness Ms. Rees testified that the entire project yield is put to beneficial use within the permitted place of use, and the requested change in place of use is not associated with, and will not create, an increase in yield from the Cachuma Project. Because Project yield is fully subscribed within the existing place of use, incorporating the added area into the permitted place of use results in the same amount of Cachuma Project water being applied to a larger area without any increase in Cachuma Project water demand or decrease in the water available for downstream flows. (MU-2, p. 1.) Member Units' and Reclamation's witnesses testified that no changes in project operations will occur as a result of approving the petitions. (R.T., November 6, 2000, pp. 40:12-40:18, 41:3-41:10, 78:3-78:25; MU-2, p. 8.) The City of Lompoc did not offer any contrary evidence that water deliveries would increase if the petition is approved.

Ms. Rees testified that granting or denying the change petition would have no bearing on the quantity, timing, or rate at which water will be released downstream pursuant to State Water Board orders and the 2000 Biological Opinion. (MU-2, p. 1, 8.) The Cachuma Project Master Contract is subordinate to Orders WR 89-18 and WR 94-5. Thus, the available supply of Cachuma Project water available for diversion to the Member Units is the net amount available after calculating and reserving, as credits in Lake Cachuma, the amount of water required to protect public trust resources and downstream interests as determined by those orders. (*Ibid.*) It is anticipated that flows downstream of the dam may increase as a result of the 2000 Biological Opinion and the Fish Management Plan; however, no reductions in flow are anticipated as a result of the petitions. (R.T., November 6, 2000, pp. 155:4-155:25, 156:1.)

Reclamation's witness, Mr. Michael Jackson, Deputy Area Manager for South Central California Office, explained that Reclamation passes water through the dam to meet its downstream release requirements prior to delivering water to its water supply contractors. Thus, downstream releases are not affected by contract delivery obligations. (R.T., November 6, 2000, pp. 37:9-37:21, 38:2-38:10; DOI-1, p. 5.) Mr. Jackson stated that the downstream release requirements and the contractual deliveries to the water supply contractors would not be modified as a result of approving the petition. For this reason,

the petition would not result in any reduction in river flows. (R.T., November 6, 2000, pp. 37:9-37:21, 38:2-38:10, 40:12-40:25, 41:1; DOI-1, p. 8.) Reclamation's Chief of Operations for the Cachuma Project, Mr. Antonio Buelna, also testified that project operations would not change, there would be no changes to river flow downstream of Bradbury Dam, and reservoir spills would not change, as a result of approving the change petition. (R.T., November 6, 2000, pp. 40:12-40:25, 41:1, 78:20-78:25.)

7.3 Conclusion

The State Water Board finds that there will be no reduction in the flow regime downstream of the dam as a result of approving the change petition. Reclamation and the Member Units have submitted substantial factual evidence that shows that approval of the change petitions will not affect Cachuma Project operations or flows in the Santa Ynez River. No party, including the City of Lompoc, introduced any contrary evidence.

7.4 CEQA Compliance

COMB prepared a Negative Declaration for the petition to add 17,506 acres to the permitted place of use and to consolidate the purposes of use for the Cachuma Project. (Staff Exhibit 3.) The Negative Declaration reflects the fact that the majority of the land annexations described in the petition occurred prior to the effective date of CEQA. The document analyzes whether all of the Cachuma Project water could have been utilized in the permitted place of use, and concludes that all of the project water could have been used in the authorized place of use. No mitigation measures are identified in the Negative Declaration.

COMB adopted the Negative Declaration on November 2, 1998, and filed a Notice of Determination with the State Clearing House. (Staff Exhibit 3.) Pursuant to California Code of Regulations, title 14, section 15096, subdivision (f), the State Water Board has considered the environmental effects of the change petition as shown in the negative declaration.

8.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT FINDINGS

Before approving a project for which an EIR has been prepared, a public agency must make one or more of the following findings for each of the significant effects of the project identified in the EIR:

- 1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the EIR.
- 2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
- 3) Specific economic, legal, social, technological, or other considerations... make infeasible the mitigation measures or project alternatives identified in the EIR.

(Cal. Code Regs., tit. 14, § 15091, subd. (a)(1-3).)

8.1 Findings Regarding Impacts to Water Supply

Under baseline conditions and all of the alternatives analyzed in the FEIR, the Member Units' water supplies would not fully meet projected demand in a critically dry year such as 1951 or during a three-year critical drought period such as 1949-1951. Under Alternative 5C, in a critically dry year, the Member Units' water supply shortage, assuming projected demand in the 2020/2030 period, could increase by 1511 af, relative to 2000 Biological Opinion/Alternative 3C. (FEIR, Vol. II, p. 4.3-18.) During a three-year critical drought period, the Member Units' water supply shortage could increase by 3,881 af relative to 2000 Biological Opinion/Alternative 3C. (*Id.*, p. 4.3-25.)

Potential water supply shortages in dry years or periods under Alternative 5C could require new sources of water, such as groundwater, temporary water transfers, or desalinated water, implemented where feasible, which could result in significant and unavoidable impacts. (FEIR, Vol. II, p.4.3-36.)

Increased groundwater pumping during droughts could have a detrimental effect on groundwater quality by increasing the flux of water from poorer water quality areas in the absence of fresh water recharge. In addition, depending on how long overdraft conditions

persist, wells may go dry or operate with reduced yields and increased pumping lifts. (FEIR, Vol. II, p. 4.3-32.) Additional groundwater pumping in some areas along the coast could cause an increase in saltwater intrusion. An increase in the total concentration of soluble salts in groundwater could reduce agricultural crop yield. (*Ibid.*) It may require expensive treatments, such as reverse osmosis, if the water is used for municipal and industrial purposes. (*Ibid.*) In addition, an increase in the concentration of soluble salts could contribute to the increased production of halogenated (organochlorinated) compounds such as trihalomethanes, which may be carcinogenic. (*Ibid.*)

A second potential new source of supply is a temporary transfer from another SWP contractor. Should the transfer initiate north of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta), some environmental impacts to the Bay-Delta could occur due to pumping extra additional water through the DWR Harvey Banks pumping plant. (FEIR, Vol. II, p. 4.3-32.)

A third potential new source of supply is desalination. There is no evidence in the record indicating whether or when the City of Santa Barbara's desalination facility will become operational. However, section 5.3.3.4, above, indicates that the additional 3,125 afa of projected potential yield of the desalination plant (FEIR, Vol. II, p. 4.3-33), would eliminate the modelled water supply impacts of Alternative 3C and Alternative 5C. (See Adjusted Table 4-17 and Table 4-25a in section 5.3.3.4.)

The desalination process may adversely affect water quality. The desalination process generates significant levels of liquid wastes, including disinfectants (chlorine and biocides), de-fouling agents, and brine effluent. (FEIR, Vol. II, p. 4.3-35.) Solid wastes or toxic metals may also be generated in lesser quantities. Liquid or solid waste may be discharged directly into the ocean, combined with sewage treatment plant wastewater or with power plant cooling water before being discharged into the ocean, or dried and disposed of in landfills. (*Ibid.*) Typically, brine effluent is carried offshore through an outfall pipe and discharged directly into the ocean or estuary from the end of the pipe or through a diffuser that accelerates the diffusion and mixing process. (*Ibid.*)

The desalination process also requires additional power generation, which has environmental consequences. A 3,000 afa seawater desalination plant would require roughly two megawatts of generating capacity continuously. (FEIR, Vol. II, p. 4.3-35.) If the electricity were produced from existing thermal power plants, it could result in impacts to air quality from air emissions and water quality impacts from the cooling system. (*Ibid.*) Much of the electricity used in California is generated through use of fossil fuels. These power plants, operating on natural gas or coal, produce nitrogen oxides (NO_x), particulate matter, reactive organic gases (ROGs), and in some cases, sulfur dioxide (SO₂). (*Ibid.*) Coal-fired generation is almost exclusively out-of-state, and the energy is brought to California through the high voltage transmission system. (*Ibid.*) Coal-fired power plants produce more air pollutant emissions than gas-fired plants, including sulfur, particulates, and carbon dioxide. Assuming that new load from the desalination facility is only met through an efficient natural gas-fired power plant using the best available emissions reduction technology, a 3,000 afa facility using two megawatts of electricity would result in 1,053 pounds of NO_x, 93 pounds of SO₂, 693 pounds of particulate matter less than 10 micrometers in diameter (PM10), 693 pounds of ROG, 2,000 pounds of carbon monoxide, and 2,000 tons of carbon per year. (*Ibid.*) This assumes that the desalination facility operates continuously.

For the foregoing reasons, the State Water Board finds that information on the status of potential new sources of supply would better inform the Board's continuing oversight of the Cachuma Project.

8.1.1 Mitigation Measures for the New Sources of Water

There are several possible sources of new supplies. While, some of these possible sources may not be available at all times, these potential sources of new supply could be implemented when feasible.

Conservation

The Member Units already have implemented conservation measures, but it may be possible to implement additional measures to make up for a temporary water supply shortage in a critical drought year or period. Section 210 of the Reclamation Reform Act

of 1982 (43 U.S.C. § 390jj(b)) requires water districts that have entered into repayment or water service contracts pursuant to federal reclamation law to develop water conservation plans. The 1996 master repayment and water service contract between Reclamation and SBCWA on behalf of the Member Units includes an acknowledgement that SBCWA and the Member Units have developed and are implementing water conservation plans as required by federal law. (DOI-1c, p. 38.) The contract also requires SBCWA to submit to Reclamation any revisions to the conservation plans and to report annually on the status of implementation of the plans. (*Id.*, pp. 38-39.)

As described in the FEIR, the Member Units also have prepared urban water management plans pursuant to the Urban Water Management Planning Act (Wat. Code, §§ 10610-10656). (FEIR, Vol. II, pp. 4.3-36 to 4.3-37.) Among other things, urban water management plans must identify and quantify available water supply sources; quantify past, current, and projected water use; and describe water demand management measures. (Wat. Code, § 10631, subds. (b), (e) & (f).) In addition, urban water management plans must include an urban water shortage contingency analysis. (*Id.*, § 10632.) The analysis must identify actions to be taken in response to water supply shortages, including mandatory prohibitions against specific water use practices, methods to reduce water consumption during the most restrictive stages of a shortage, and penalties or charges for excessive use. (*Id.*, § 10632, subds. (a)(4)-(6).) The FEIR identified implementation of the drought contingency measures identified as part of the Member Units' urban water shortage contingency analyses as a mitigation measure for the water supply related impacts of water shortages under Alternative 5C. (FEIR, Vol. II, p. 4.3-37.)

Surcharges can be imposed by DWR

If a water transfer is initiated north of the Bay-Delta, DWR can mitigate any adverse effects using water surcharges. (FEIR, Vol. II, p. 4.3-33.) These additional water surcharges range from 20 percent to 50 percent of the transferred water, depending on year type and current hydrologic conditions. (*Ibid.*) The water surcharges augment Bay-Delta outflow and serve to combat water quality problems that can occur in the central and south Bay-Delta as pumping is increased to move the transferred water. (*Ibid.*)

New projects, such as transfers, will be studied by the prospective project proponent in compliance with CEQA as necessary once such projects are actually proposed. Some water transfers may require State Water Board approval of a transfer petition. The Board may impose any conditions of approval necessary to ensure that a transfer will not injure third party water right holders or unreasonably affect fish, wildlife, or other instream beneficial uses. (See Wat. Code, § 1725.) Accordingly, the Board can mitigate for the environmental impacts of any transfers that require its approval.

Desalination

The additional power generation associated with desalination could be mitigated in part if the desalination plant is designed so that it can be shut down during peak power demand periods, thereby taking advantage of unused power capacity in off-peak times. (FEIR, Vol. II, p.4.3-35.)

Any potential water quality impacts associated with discharge due to desalination are mitigable to less than significant levels through compliance with a national pollutant discharge elimination system (NPDES) permit issued by the Regional Water Quality Control Board, Central Coast Region (Regional Water Board). The NPDES permit will ensure that the beneficial uses of receiving waters are protected.

No mitigation measures for the potential impacts attributable to groundwater pumping are identified in the FEIR, but local agencies can and should adopt groundwater management plans that limit pumping to the extent necessary to prevent overdraft. Effective January 1, 2015, groundwater resources must be managed in accordance with the Sustainable Groundwater Management Act (SGMA) (Wat. Code, § 10720 et seq.) SGMA prioritizes groundwater basins that are currently overdrafted and sets the following timeline for implementation:

- 1) Local groundwater management agencies must be identified by 2017, (Wat. Code, § 10735.2, subd. (a)(1));
- 2) High and medium priority groundwater basins that are subject to critical conditions of overdraft must have sustainability plans by 2020, (*id.*, §§ 10720.7, subd. (a)(1), 10735.2, subd. (a)(2));

- 3) Other high and medium priority basins must have sustainability plans by 2022, (*id.*, §§ 10720.7, subd. (a)(2), 10735.2, subds. (a)(3)-(4)); and
- 4) All high and medium priority groundwater basins must achieve sustainability within 20 years of plan implementation (*id.*, § 10727.2, subd. (b)(1)).

8.1.2 Findings

Section 15091, subdivision (a)(1) Finding

Pursuant to California Code of Regulations, title 14, section 15091, subdivision (a)(1), the State Water Board finds as follows.

The Board cannot require the Member Units to implement conservation measures pursuant to this order, and Reclamation does not have the ability to implement conservation measures directly. However, the Board has adopted emergency conservation regulations that apply to the Member Units, and could do so again in the future if conditions warrant. (See also generally Wat. Code, § 1058.5.) In addition, Reclamation has the authority to require conservation measures to be implemented pursuant to its contracts. Accordingly, the State Water Board will require Reclamation to require the Member Units to implement the demand management measures identified as part of the urban water shortage contingency analyses contained in the Member Units' urban water management plans. In the event that Reclamation does not succeed in amending its contracts by December 31, 2020, this order reserves authority for the Deputy Director to modify Reclamation's permits to achieve comparable water use reductions to the Member Units' water demand management measures and delegates that authority to the Deputy Director. The fact that the Member Units identified these measures in their plans indicates that they are feasible and that requiring the measures be implemented is reasonable. Moreover, it may not be necessary to amend Reclamation's current contract with SBCWA, which already requires implementation of conservation plans. Presumably, the Member Units' urban water management plans constitute the conservation plans required by the contract.

Although implementation of the water demand management measures should serve to reduce the environmental effects of water supply shortages under Alternative 5C, it is possible that the effects will not be avoided altogether or reduced to less than significant

levels. Additionally, Reclamation could consider temporary transfers from another SWP contractor and desalination to reduce the environmental effects of water supply shortages under Alternative 5C.

Section 15091(a)(2) Findings

Pursuant to California Code of Regulations, title 14, section 15091, subdivision (a)(2), the State Water Board finds as follows. With respect to temporary transfers initiated north of the Bay-Delta that do not require the Board's approval, surcharges to augment Bay-Delta outflow are within the responsibility and jurisdiction of DWR and not the State Water Board. Such surcharges can and should be adopted by DWR.

The issuance of a NPDES permit for a desalination plant is the responsibility of the Regional Water Board, and review of that action is the responsibility of the State Water Board. The Regional Water Board can and should mitigate the environmental impacts of a desalination plant through the exercise of its NPDES permitting authority, should a desalination plant be proposed. The State Water Board may exercise its oversight authority, if necessary.

With respect to local regulation of groundwater pumping, Reclamation shall require the Member Units to implement the demand management measures identified as part of the urban water shortage contingency analyses contained in the Member Units' urban water management plans. The Deputy Director may modify Reclamation's permits to achieve comparable water use reductions to the Member Units' water demand management measures if Reclamation does not require them.

Section 15091, subdivision (a)(3) Finding

Pursuant to California Code of Regulations, title 14, section 15091, subdivision (a)(3), the State Water Board finds that, to the extent water supply impacts will not be mitigated by the Board, DWR, the Regional Water Board, or local agencies, the FEIR does not identify any additional mitigation measures, and specific economic, legal, social, technological, and other considerations that make the alternatives infeasible. As discussed above, the Board has authority to mitigate for the impacts of any future transfers that are subject to

its jurisdiction, but any such mitigation measures would have to be imposed as conditions of approval of future transfers.

Alternatives 2, 3C, and 4B would avoid the significant and otherwise unavoidable impacts attributable to water supply shortages under Alternative 5C, but those alternatives are infeasible because they do not meet the State Water Board's objective of protecting the Santa Ynez River steelhead and other public trust resources to the extent feasible and in the public interest, consistent with the reasonable use and public trust doctrines. As has been discussed in this order, the Santa Ynez River steelhead fishery is not in good condition.

In addition, Alternative 2, which represents environmental conditions in 2000, is no longer representative of existing conditions due to Reclamation's implementation of operational and other changes since 2000 to comply with the 2000 Biological Opinion, including the 3.0-foot surcharge. Those operational and other changes essentially render Alternative 2 obsolete. Under Alternative 4B, releases from Bradbury Dam to recharge the Lompoc Plain Groundwater Basin would be exchanged for SWP water discharged into the Santa Ynez River in the vicinity of the Lompoc Forebay. The City of Lompoc has taken the position that Alternative 4B is infeasible because city residents have rejected SWP water as a new water supply. (FEIR, Vol. II, p. 3.0-19.)

8.2 Findings Regarding Impacts to Oak Trees

Surcharging Cachuma Reservoir under Alternatives 3C and 5C inundates the oak trees growing at the margins of the reservoir. The oak woodlands at the margins of the reservoir are recognized as a significant plant community by both Santa Barbara County and the State. Surcharge to 3.0 feet was implemented in 2009, therefore, impacts to the oak trees associated with the 3.0-foot surcharge under Alternatives 3C and 5C have already occurred. Of the 3,147 acres of lakeshore margin impacted by the surcharge, approximately 24.1 percent supported oak woodlands. (FEIR, Vol. II, p. 4.8-12.)

The EIR identified the impacts to oak trees under Alternatives 3C and 5C along the margins of Cachuma Reservoir as a significant, unmitigable impact. Reclamation will compensate for the loss of approximately 755 acres of oak woodlands by the

implementation of an integrated Oak Woodland Restoration Plan that at a minimum achieves a 2:1 replacement ratio of each oak lost after 20 years. (FEIR, Vol. II, p. 4.8-12.) When the replacement trees become established and self-sustaining, the loss of oak trees under Alternatives 3C and 5C will be considered a significant but mitigable impact.

8.2.1 Findings

Section 15091(a)(1) Finding

Pursuant to California Code of Regulations, title 14, section 15091, subdivision (a)(1), the State Water Board finds that the long-term impacts to oak trees will be mitigated by requiring Reclamation to implement the Integrated Oak Woodland Restoration Plan as a condition of the Permits.

Section 15091(a)(3) Finding

Pursuant to California Code of Regulations, title 14, section 15091, subdivision (a)(3), the State Water Board finds that specific economic, legal, social, technological, and other considerations make mitigation for the short-term impact to the oak trees during restoration infeasible. The FEIR did not identify any mitigation measures for this impact. The impact would have been avoided under the No Project Alternative, and the impact would have been reduced under Alternatives 3B, 4B, and 5B, which assumed that a 1.8-foot surcharge would be implemented. Those alternatives are infeasible, however, because a 3.0-foot surcharge has already been implemented.

8.3 Findings Regarding Impacts to Cultural Resources

There are at least 18 documented archaeological surveys or excavations within the area surrounding Cachuma Reservoir on file at the Central Coast Information Center housed at the University of California, Santa Barbara. (FEIR, Vol. II, p. 4.11-7.) The EIR found that surcharging Cachuma Reservoir by 1.8 feet under Alternatives 3B and 5B, and 3.0 feet under Alternatives 3C, 4B and 5C, could have a significant but mitigable impact to cultural resources, specifically two archeological sites located along the margins of the reservoir. (FEIR, Vol. II, p. 4.11-15.) The 3.0-foot surcharge to Cachuma Reservoir was completed in 2009, therefore the potential for impacts has already occurred.

The EIR found that the implementation of three mitigation measures would reduce the impacts under Alternatives 3B, 3C, 4B, 5B and 5C to a less than significant level. (FEIR, Vol. II, pp. 4.11-16 to 4.11-17.) The three mitigation measures are:

- 1) Data recovery excavation conducted on a representative sample of the features and artifacts contained within those portions of certain archeological sites impacted by surcharging,
- 2) Implementation by Reclamation of a Memorandum of Agreement regarding additional surcharging, and
- 3) Evaluation by a professional archeologist if unknown archeological materials are identified.

(FEIR, Vol. II, pp. 4.11-16 to 4.11-17.)

8.3.1 Findings

Section 15091(a)(1) Finding

The mitigation measures referenced above were implemented. (FEIR, Vol. II, p. 4.11-17.) Therefore, in accordance with California Code of Regulations, title 14, section 15091, subdivision (a)(1), and with section 21082.3 of the Public Resources Code, the State Water Board finds that mitigation measures have been incorporated into the project that avoided or substantially lessened the significant environmental effect identified in the FEIR.

8.4 Statement of Overriding Considerations

CEQA requires an agency to balance the economic, legal, social, technological, or other benefits of a project against the significant unavoidable environmental impacts when determining whether to approve the project. (Cal. Code Regs., tit. 14, § 15093, subd. (a).) In this case, the benefits of modifying Reclamation's Permits as proposed outweigh the significant unavoidable environmental impacts for the following reasons. There is overwhelming evidence in the record that the steelhead in the Santa Ynez River are not in good condition and that the requirements of the 2000 Biological Opinion, reflected in Alternative 3C, are unlikely to restore the steelhead population to good condition on their own. Evidence in the hearing record clearly indicates that habitat, and, in particular, juvenile rearing habitat, is the primary limiting factor preventing the Santa Ynez River

steelhead fishery from being in good condition. (FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-3; DFG-2, pp. 7-9; CT-90, p. 4, NOAA-2; p. 5, MU-226, p. 6; R.T. October 23, 2003, pp. 506:25-507:20; R.T. November 12, 2003, pp.645:22-646:2.) The record also supports the finding that the Alternative 5C will provide the endangered steelhead with additional habitat, rearing habitat in particular, and should lead to an improvement in the condition of the species. Based on the application of a standard of good condition, this order directs Reclamation to take immediate action, in combination with monitoring plans and long-term studies, to help restore the steelhead population to good condition. Such changes are necessary to protect steelhead as a public trust resource.

This action is consistent with the State Water Board's responsibility to protect public trust resources to the extent feasible. Although all of the efforts to improve water supplies for the Member Units are unclear, there is evidence in the record sufficient to support the possibility that improvements are possible. Therefore, the benefits of Alternative 5C outweigh any significant and unavoidable environmental impacts attributable to water supply shortages that may result from this action. The State Water Board makes this statement of overriding considerations without considering the information presented in section 5.3.3.4.

It is unnecessary to make a statement of overriding considerations with respect to the short-term impact to oak trees due to surcharging Cachuma Reservoir because Reclamation has already implemented the surcharge, and the impacts have occurred irrespective of this order.

8.5 Mitigation, Monitoring, and Reporting Program

When an agency finds that a significant environmental impact of a project will be avoided or substantially lessened, the agency must adopt a program for monitoring or reporting on the changes that the agency has either required in the project or made a condition of approval in order to mitigate the impact. (Cal. Code, Regs., tit. 14, § 15091, subd. (d).)

This order requires Reclamation to amend its water service contract with SBCWA to the extent necessary to require the Member Units to implement the water demand

management measures identified as part of the urban water shortage contingency analysis contained in their urban water management plans.⁷⁰ In the event that Reclamation does not succeed in amending its contract with SBCWA by December 31, 2020, this order reserves authority to amend Permits 11308 and 11310 (Applications 11331 and 11332) in order to achieve comparable water use reductions. Further, this order requires Reclamation to provide annual status updates on conservation efforts and efforts to make new water supplies and conserved water available to the Member Units. This order also requires Reclamation to implement the Oak Woodland Restoration Plan that will achieve a 2:1 replacement ratio 20 years after the first Cachuma surcharge event. The State Water Board will require Reclamation to report to the Deputy Director by December 31 of each year regarding the compliance with all permit terms, including the terms requiring that these mitigation measures be implemented.

9.0 Compliance with State Water Board Order WR 94-5

In Phase 1 of the hearing, the State Water Board received evidence and arguments from the parties on the issue of whether Reclamation adequately complied with Order WR 94-5. In Order WR 94-5, the State Water Board determined that additional information was needed before the State Water Board could take final action addressing the measures needed to protect downstream water rights and public trust resources, including fishery resources. Order WR 94-5 required Reclamation to submit specified documents and information no later than February 1, 2000.

Order WR 94-5 also required the Chief of the Division to determine, by March 1, 2000, what additional environmental documentation, if any, was required by CEQA in

⁷⁰ Reclamation's comment letter on the draft order contends that the State Water Board lacks authority to require Reclamation to amend its water service contract with SBCWA. (U.S. Bureau of Reclamation, December 9, 2016 comment letter, pp. 2-3.) Section 8 of the Reclamation Act of 1902, codified at 43 U.S.C. § 383, requires that "the Secretary of the Interior, in carrying out the provisions of this Act, shall proceed in conformity with" state law "relating to the control, appropriation, use, or distribution of water used in irrigation." (See also *California v. United States* (1978) 438 U.S. 645, 675.) The Board acknowledges Reclamation's discretion when deciding whether to proceed with carrying out the provisions of the Reclamation Act. (See also 43 U.S.C. §§ 373, 373a, 390b.) Once Reclamation has decided to carry them out, Congress has made clear that Reclamation shall do so in conformity with state law. (See also generally Wat. Code, §§ 183, 275, 1051, subd. (c), 1052, subd. (a); 1200–1202, 1250, 1252, 1252.5, 1831, subd. (d)(2).)

connection with the State Water Board's consideration of modifications to Reclamation's Permits to protect downstream water rights and public trust resources. Order WR 94-5 required Reclamation to prepare any such additional environmental documentation and to submit a draft to the Division Chief by July 31, 2000. By letter dated April 23, 1998, the Division Chief directed Reclamation to prepare an administrative draft EIR. Order WR 94-5 required the State Water Board to commence a hearing to determine the releases from Bradbury Dam necessary to satisfy downstream rights by December 1, 2000. The scope of the hearing was to include consideration of the requirements to carry out the Board's continuing authority to protect public trust uses and prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water.

The record supports the finding that Reclamation adequately complied with the submittal requirements. Reclamation did not fully comply with Order WR 94-5 because it did not complete the administrative draft EIR in connection with the State Water Board's consideration of modifications to Reclamation's Permits by the March 1, 2000 deadline established in Order WR 94-5. Enforcement of this requirement is no longer necessary, however, because an administrative draft EIR was completed.

10.0 Conclusion

The hearing record does not support the conclusion that the steelhead fishery in the Santa Ynez River is in good condition within the meaning of the public trust doctrine or as expressed in Fish and Game Code section 5937. The construction and operation of the Cachuma Project has had a substantial impact on the Southern California DPS of steelhead and was a major factor that lead to the DPS being listed as endangered under the federal ESA. The flows required pursuant to the 2000 Biological Opinion for the project and the partial completion of the tributary passage improvements are benefitting the steelhead fishery. However, evidence in the record establishes that steelhead remain in poor condition at the population and community levels despite the fact the 2000 Biological Opinion has been in effect for several years. Moreover, there is no indication

that the condition of the fishery will improve unless additional measures are implemented to increase the amount of suitable habitat available for spawning and rearing.

Scientific knowledge of the biological needs of Santa Ynez River steelhead is currently inadequate for the Board to make a definitive decision on how best to protect Santa Ynez River steelhead. However, the hearing record supports the conclusion that Alternative 5C can provide additional steelhead rearing and spawning habitat which helps address an important limiting factor for steelhead populations in the Santa Ynez River. Therefore, this order requires Reclamation to release additional water to provide higher instream flows in the lower Santa Ynez River during wet and above normal years to increase the amount of steelhead habitat downstream of Bradbury Dam. Although the higher flow requirement may reduce stored water for human use in critically dry years or periods, the Member Units' need for the water does not outweigh the need to protect the steelhead fishery by increasing the habitat available below Bradbury Dam.

The Board acknowledges that uncertainty exists concerning the full extent of the benefits of the higher flows under Alternative 5C. Therefore, Reclamation will be required to study the effects of the increased flows on steelhead and verify the utility of the additional amount of habitat created given temperature, dissolved oxygen, and substrate conditions. The Board will reserve authority to reduce or modify the flow requirement if the results of the study demonstrate that the flows do not provide the anticipated benefits to the steelhead fishery, or if greater water supply impacts are discovered. Also, with oversight from the Executive Director, NMFS or CDFW can direct Reclamation to temporarily terminate or reduce the requirement to meet the increased flows to prevent any detrimental effects to the steelhead. Additionally, to maximize benefits to the fishery, an adaptive management approach allows for NMFS, CDFW, Reclamation, and the Member Units to modify the timing of the flows, provided that doing so does not cause any additional water supply impacts above those identified in the FEIR.

To improve the state of knowledge concerning the protection of the steelhead fishery, this order also requires Reclamation to specify one or more metrics that can be used to quantify what would constitute good condition of the fishery at the individual, population,

and community levels. This order requires Reclamation to study the feasibility of additional measures that may be necessary to restore the fishery to good condition, including passage around Bradbury Dam, modified instream flows, and measures to address predators and other species with a potential to negatively affect steelhead. The Board will reserve authority to determine the adequacy of the studies and, after satisfactory completion of the studies, to determine whether any additional measures should be implemented consistent with the Public Trust Doctrine to restore steelhead to good condition. If greater habitat gains can be achieved through improvement projects that result in achieving good condition of the steelhead fishery, the Board may require implementation of these projects in lieu of increased flow requirements.

For the protection of downstream rights, this order amends terms 5 and 6 of Reclamation's Permits, as modified by Order WR 73-37 and amended by Order WR 89-18, in accordance with the technical amendments proposed by the parties to the Settlement Agreement, dated December 17, 2002, and agreed to by Reclamation. The technical amendments generally provide for:

- 1) An alternative measurement location for the "live-stream" determination at San Lucas Bridge (Highway 154) in light of fish water releases that are routinely made and present at that location and have been since 1993;
- 2) Implementation of the conjunctive operation of the BNA, with respect to determining the application of Curve A and Curve B in determining the BNA credits; and
- 3) Recognition of additional measurements to be carried out with respect to water flows and quality.

The Board recognizes that the parties may need to negotiate changes to the Settlement Agreement in light of the releases for steelhead required by this order, and will reserve authority to make any amendments to Reclamation's Permits that may be necessary based on any changes to the agreement.

Finally, this order grants Reclamation's 1983 petition to change the place and purpose of use authorized under its Permits. Accordingly, the Permits will be amended to include within the authorized place of use all lands within the Cachuma Member Units' service

areas, and a net of 40,250 irrigable acres within a gross area of 205,376 acres, as shown on specified maps. The Permits will also be amended to authorize the following purposes of use: "Irrigation, Municipal, Domestic, Industrial, Salinity Control, Incidental Recreation, Stockwatering, and Fish and Wildlife Conservation."

ORDER

Permits 11308 and 11310 shall be replaced with amended permits that contain all current terms and conditions set forth in the original permits, the applicable terms and conditions adopted pursuant to subsequent decisions and orders, and the terms, conditions, and changes specified herein. In addition, the amended permits shall be updated to include current mandatory terms and conditions. Specific term and condition numbers and corresponding references to those specific terms and conditions may be updated upon issuance of amended permits.

IT IS HEREBY ORDERED that the United States Bureau of Reclamation's⁷¹ petition to change Permits 11308 and 11310 (Applications 11331 and 11332) is approved.

1. The authorized purpose of use under Permits 11308 and 11310 shall be:

Irrigation, Municipal, Domestic, Industrial, Salinity Control, Incidental Recreation, Stockwatering, and Fish and Wildlife Conservation.

2. The authorized place of use under Permits 11308 and 11310 shall be:

The Santa Ynez River including Lake Cachuma and tributaries (including Hilton Creek) for Fish and Wildlife Conservation. All lands included within existing boundaries (205,376 acres) including the areas of service within the political boundaries of the Cachuma Member Units: the Carpinteria Valley Water District, the City of Santa Barbara, the Goleta Water District, the Montecito Water District, and the Santa Ynez River Water Conservation District, Improvement District No. 1, and a net irrigable acres of 40,250 acres within a gross area of 205,376 acres, as

⁷¹ The term "right holder" in the following permit terms refers to the Permittee, the U.S. Bureau of Reclamation.

shown on maps filed with the State Water Board. Recreational use at Cachuma Reservoir.

IT IS FURTHER ORDERED that Permits 11308 and 11310 shall be amended to reflect the modifications to existing conditions and the addition of new conditions required below, and amended permits shall be issued that are consistent with the current permit template used by the Division of Water Rights.

3. Permits 11308 and 11310 shall be amended to include mandatory permit terms A through Q. Mandatory permit term E shall replace existing permit terms 3 and 11, and mandatory permit term O shall replace existing permit term 4 of Permits 11308 and 11310.
4. Standard permit terms 5F and 5R shall replace existing permit terms 1 and 2 respectively of Permits 11308 and 11310.
5. For the protection of downstream rights, existing permit terms 5 and 6 of Permits 11308 and 11310, as modified by Order WR 73-37 and amended by Order WR 89-18, shall be amended in accordance with the technical amendments proposed by the parties to a settlement agreement dated December 17, 2002, and agreed to by right holder, and attached to and incorporated herein by reference (Appendix 2).

All other sections, paragraphs or subparagraphs of existing permit terms 5 and 6 of Permits 11308 and 11310, as modified by Order WR 73-37 and amended by Order WR 89-18, not specifically amended by the December 17, 2002 agreement or this Order are intended to and shall remain in full force and effect.

6. Existing permit term 7 of Permits 11308 and 11310, as modified by Order WR 73-37 and amended by Order WR 89-18, shall be amended to read as follows:

The State Water Board reserves authority to make any amendments to Permits 11308 and 11310, as may be required concerning proper and adequate releases of water for downstream use, and recharge of groundwater, in satisfaction of downstream rights, based on any changes

to the December 17, 2002 settlement agreement between the Cachuma Conservation Release Board; the Santa Ynez River Water Conservation District, Improvement District No. 1; the Santa Ynez River Water Conservation District; and the City of Lompoc, following notice and opportunity for hearing.

7. Existing Permit terms 9, 10, 12, and 13 of Permits 11308 and 11310, shall remain unchanged.
8. Right holder is on notice that when the State Water Board determines that any person is violating, or threatening to violate, any term or condition of a right, the State Water Board may issue an order to that person to cease and desist from that violation. (Wat. Code, § 1831.) Civil liability may be imposed administratively by the State Water Board pursuant to Wat. Code, § 1055, or may be imposed by the superior court. The Attorney General, upon the request of the board, shall petition the superior court to impose, assess, and recover those sums. (Wat. Code, § 1846.)
9. Right holder shall comply with the measuring and monitoring requirements as specified in the terms of this right or any reporting requirements by statute, order, policy, regulation, decision, judgment or probationary designation. The more stringent requirement shall control in each instance where there is a conflict or inconsistency between the requirements. Right holder shall comply with the measuring and monitoring requirements of chapter 2.8, title 23, California Code of Regulations.
10. Right holder shall measure the amount of water beneficially used under this right using devices and/or methods satisfactory to the Deputy Director.

In order to demonstrate compliance with the beneficial use monitoring requirements of this right, right holder shall provide evidence that the devices and/or methods are functioning properly, in a manner satisfactory to the Deputy Director, within thirty days of first use of the device or method, with the reports required by chapter 2.7,

title 23, California Code of Regulations, and whenever requested by the Division of Water Rights.

11. Right holder shall comply with the reporting requirements of chapter 2.7, title 23, California Code of Regulations. Right holder shall promptly submit any reports, data, or other information that may reasonably be required by the State Water Board, including but not limited to documentation of water diversion and beneficial use under this right.
12. Urban water suppliers must comply with the Urban Water Management Planning Act (Wat. Code, § 10610 et seq.) An “urban water supplier” means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. This term will be implemented in conjunction with term 34.
13. Agricultural water users and suppliers must comply with the Agricultural Water Management Planning Act (Act) (Water Code, § 10800 et seq.). Agricultural water users applying for a permit from the State Water Board are required to develop and implement water conservation plans in accordance with the Act. An “agricultural water supplier” means a supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. An agricultural water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers.
14. No water shall be diverted or used under this right for commercial and applicable personal medical use cannabis cultivation unless the water right holder is in compliance with all applicable conditions, including the numeric and narrative instream flow requirements, of the current version of the State Water Board’s Cannabis Cultivation Policy – Principles and Guidelines for Cannabis Cultivation.

IT IS FURTHER ORDERED that for the protection of fish and other public trust resources in the Santa Ynez River and to prevent the waste and unreasonable use of water, Permits 11308 and 11310 are amended to include the following new conditions, as set forth below:

15. Except as otherwise provided in this term and in term 16 below, right holder shall operate and maintain the Cachuma Project and implement conservation measures including but not limited to those described in Revised Section 3 (Proposed Project) of the Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River, June 2000, taking into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion, and right holder shall comply with all of the Reasonable and Prudent Measures 5 and 7 through 13, set forth at page 68, and the Terms and Conditions, set forth at pages 70–78, in the National Marine Fisheries Service’s (NMFS) Biological Opinion: U.S. Bureau of Reclamation operation and maintenance of the Cachuma Project on the Lower Santa Ynez River in Santa Barbara County, California, September 2000 (2000 Biological Opinion). Right holder shall notify the State Water Board’s Executive Director (Executive Director) within 30 days of the issuance of a new Biological Opinion. To prevent any conflicting requirements upon issuance of any new Biological Opinion, the Executive Director may modify this term upon request of right holder after receiving the approval of NMFS. Any modification to this term shall be made in accordance with section 780 of title 23 of the California Code of Regulations.
 - a. For the protection of fish and other public trust resources in the Santa Ynez River below Bradbury Dam, right holder shall release or bypass water to maintain the following Mainstem Rearing instream flows in the Santa Ynez River, as set forth below, at all times.

Table 1 Flows
Mainstem Rearing Flows

Reservoir Spill ^a (af)	Lake Storage ^b (af)	Flow (cfs) Requirements at:		
		<i>Highway 154</i>	<i>Alisal Road</i>	<i>Stilling Basin & Long Pool</i>
≥ 20,000	NA	10	1.5 ^c	-
< 20,000	≥ 120,000	5	1.5 ^d	-
	≥ 30,000 and < 120,000	2.5	1.5 ^d	-
	< 30,000	-	-	30 af/mo ^e

NA - not applicable

^aReservoir spill is calculated cumulatively over the course of the water year (FEIR, Vol. IV, Appendix F, Draft Technical Memorandum No. 5, p. 6), which begins October 1 (FEIR, Vol. IV, Appendix F, Draft Technical Memorandum No. 5, p. 8).

^bLake storage is measured on the first day of each month. (FEIR, Vol. IV, Appendix E, Technical Memorandum No. 1, p. 5.)

^cThe specified flow applies only when *Oncorhynchus mykiss* are present.

^dThe specified flow applies only if there was reservoir spill greater than or equal to 20,000 af in the prior water year and *Oncorhynchus mykiss* are present in the Alisal Reach.

^eWhen there is less than 30,000 af of total water stored in the reservoir, regardless of origin, right holder shall provide periodic releases of 30 af per month to refresh the Stilling Basin and Long Pool directly downstream of the dam to provide for *Oncorhynchus mykiss* rearing in these areas. Less than 30 af per month may be released upon determination by the fishery agencies and the State Water Board that less water is necessary to refresh the Stilling Basin and Long Pool directly downstream of the dam for *Oncorhynchus mykiss* in these areas.

- b. Notwithstanding the foregoing, right holder is not required to implement any of the tributary passage impediment and barrier fixes described in Revised Section 3 (Proposed Project) of the Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River, June 2000.
 - c. Right holder shall proceed with rescue efforts within a period necessary to prevent steelhead mortality following any flow interruption of the Hilton Creek Watering System. Right holder shall post all flow interruptions of the Hilton Creek Watering System and rescue efforts on a publicly accessible website.
16. Right holder shall release or bypass water to meet the Table 2 Flows, set forth below, at all times during Wet and Above Normal water year types.

- a. For purposes of this term, water year types shall be classified in accordance with the following index:

Cachuma Reservoir Inflow Index for Water Year Classification

Water Year Classification (Oct. 1 – Sep. 30)	Index (Cachuma Reservoir Inflow) (af)
Wet	> 117,842
Above Normal	≤ 117,842 > 33,707
Below Normal	≤ 33,707 > 15,366
Dry	≤ 15,366 > 4,550
Critical	≤ 4,550

- b. Table 2 Flows are triggered when the cumulative Cachuma inflow (beginning October 1 of each year) of 33,307 af is first reached during a water year. Cumulative Cachuma inflow starts at zero at the beginning of every water year.

Table 2 Flows
(Wet and Above Normal Water Year Types)

Minimum Flow Requirement*	Period of Flow	Purpose of Flow
48 cfs	02/15 to 04/14	Spawning
20 cfs	04/15 to 06/01	Incubation and Rearing
25 cfs	06/02 to 06/09	Emigration
Ramp to 10 cfs by 06/30		
10 cfs	06/30 to 10/01	Rearing and Resident Fish Maintenance
5 cfs	10/01 to 02/15	Resident Fish

*The above flows shall be maintained at both San Lucas and Alisal bridges. These flows may be met with both natural stream flow and releases from Bradbury Dam.

- c. During any given water year, Table 2 Flows may be reduced or terminated for a period not to exceed the remainder of the water year if CDFW or NMFS determines that the flows are likely to harm the fishery. Right holder shall temporarily reduce or stop releases to meet the Table 2 Flows if and as directed by the Director of CDFW or the Assistant Regional Administrator for Protected Resources in the Southwest Region of the NMFS. Within three business days of receiving direction from CDFW or NMFS to temporarily reduce or stop releases to meet the Table 2 Flows, right holder shall notify the Executive Director and provide all relevant supporting information. The Executive Director may disapprove the direction to reduce or terminate the flows if the Executive Director disagrees with the determination that Table 2 Flows would harm the fishery, after which the Executive Director will confer with NMFS and CDFW. Right holder shall make available on a publicly accessible website the determination by CDFW and NMFS that flows will be modified, including information regarding the reason the flows are likely to harm the steelhead, any new regimes that are implemented, and the expected duration of the modification. In exercising authority under this paragraph, the Executive Director shall not reduce any water releases other than releases to meet Table 2 Flow requirements.
- d. Right holder shall implement a change to the schedule of the Table 2 Flows as directed by CDFW or NMFS, if CDFW or NMFS, right holder, and the Member Units have agreed to an accounting method that ensures that the change will not cause a greater water supply impact than the impact that would occur if water were released to meet the Table 2 Flows in accordance with the existing schedule. Within five business days of reaching an agreement that allows for the Table 2 Flow schedule to be changed, right holder shall notify and submit the agreement to the Executive Director, who may disapprove any changes to the schedule. Any change to the schedule of Table 2 Flows shall comply with the requirements of the California

Environmental Quality Act Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000–15387).

- e. If CDFW or NMFS directs a change to the schedule of Table 2 Flows pursuant to paragraph (16b) above, but right holder and the Member Units do not agree to the change consistent with paragraph (16d), CDFW or NMFS may request the Executive Director to require the change, and the Executive Director may require right holder to implement the change, provided that the Executive Director determines that the change will not cause a greater water supply impact than the impact that would occur if water were released in order to meet the Table 2 Flows in accordance with the existing schedule.
 - f. Within one year of the adoption of this Order, right holder shall confer with the Member Units to analyze reducing the safe yield of the Cachuma Project to prevent the loss of beneficial uses of the project during severe shortages. In determining the project’s safe yield, right holder and Member Units shall consider the increased flow requirements (Table 2 Flows) in wet and above normal water years, past multi-year droughts, and the potential for more frequent and severe periods of drought in the future. Consideration shall also be given to revision of the assumptions used in prior determinations of the “operational yield” of the project. Within 18 months of the adoption of this Order, right holder shall advise the Executive Director in writing of any current or planned reduction to the Cachuma Project’s safe yield.
17. For all draft and final plans, studies, and reports required by this Order, right holder shall consult with CDFW and NMFS. Consultation shall include, but need not be limited to, the following:
- (1) Within 30-business days of adoption of this Order, right holder shall contact and schedule ongoing and regular consultation meetings with CDFW and NMFS. Right holder, NMFS, and CDFW shall develop and identify study and plan components during their consultation meetings.

- (2) Upon completion of any study plan component, whether draft or final, right holder shall transmit the components to CDFW and NMFS.
 - (3) Right holder shall provide CDFW and NMFS with at least 30-business days to comment on the documents prior to submittal to the Deputy Director. This 30-business day comment period shall apply to all draft, final, or revised submissions to the Deputy Director.
 - (4) Right holder shall include any comments submitted by CDFW or NMFS in any submission to the Deputy Director, shall explain how the comments were addressed, and shall explain right holder's reasons for not incorporating changes based on comments from CDFW or NMFS, if applicable.
 - (5) In addition to the regular ongoing meetings, right holder shall hold an annual meeting with CDFW and NMFS during each year that studies described in this Order are being conducted. The annual meeting will be held in July, unless a different date is mutually agreed upon in writing. At the annual meeting, right holder must present data collected in the previous year and report progress on each study identified in the approved study plan and compliance with this Order.
18. Within 90 days from the date of this Order, right holder shall submit to the Deputy Director for approval, a plan, describing the measures in place or that will be implemented to ensure compliance with terms 15 and 16. If the plan includes future measures, a schedule for implementation of those measures must also be provided. The Deputy Director may direct right holder to make any changes to the plan reasonably necessary to ensure compliance.
19. Right holder shall conduct a study that evaluates the effectiveness of the Table 2 Flows at protecting public trust resources as evaluated over five Wet or Above Normal water year types. Right holder shall complete, submit, and post a report on the results of the study within a year after the conclusion of the fifth Wet or Above Normal water year unless the Executive Director approves a time extension. This

study shall be conducted in a manner that provides comparable data to the current monitoring data required by term 26. At a minimum the study must evaluate:

- (1) The effects of Table 2 flows on steelhead in the river and quantification of the amount of additional habitat provided, including habitat below the Alisal Reach;
 - (2) The quality and suitability of the additional habitat, considering temperature, dissolved oxygen, and substrate;
 - (3) Any detrimental effects, demonstrated by clear, scientific evidence, to steelhead in the river caused by the additional flows, such as reduced cold water refugia;
 - (4) Whether benefits to the steelhead fishery could be maximized through an alternative flow schedule with equivalent or reduced water supply impacts; and
 - (5) The extent to which the Table 2 Flows can be conjunctively used to satisfy downstream water rights and whether any adjustments to the “above Narrows” account or the “below Narrows” account are warranted to minimize the effects of release or bypass flow requirements on Cachuma Project yield. In performing this analysis, right holder shall confer with interested parties regarding any adjustments to the above Narrows account and/or the below Narrows account.
20. Right holder shall develop a plan for conducting the studies in term 24 and any other studies that may be necessary to determine the measures necessary to protect the public trust resources of the Santa Ynez River and keep the steelhead fishery in the Santa Ynez River in good condition at the individual, population, and community level. Submittal of the plan for approval by the Deputy Direction is due within 6 months of the date of this Order unless the Deputy Director provides for an extension of this timeframe. The study plan shall identify the proposed deadlines for completing: each of the individual studies, including the sequencing of the studies; draft reports of the findings of the studies for review and comment by CDFW and NMFS; and the final reports of the results. The study plan shall also

include a description of the appropriate metrics to be used to evaluate to what extent a given measure will restore steelhead to good condition.

21. Right holder shall conduct the studies pursuant to the approved study plan described in term 20, including any changes directed by the Deputy Director, including phasing, refinement, or augmentation of studies. The Deputy Director may also require updates and revisions to the study plan on a periodic or as-needed basis as studies are completed or new information becomes available. To the extent possible, studies shall be conducted concurrently and in coordination with any other studies that right holder may be conducting or planning to conduct. Upon written agreement by CDFW and NMFS, the Deputy Director may determine that existing studies fulfill applicable study requirements of this condition.
22. After completing each study, right holder shall submit a report to the Deputy Director, CDFW, and NMFS that describes the study and its results and post the report on a publicly accessible website. Right holder shall also develop and submit a final report within a year after completion that summarizes all of the findings of the above reports and identifies specific measures that could be implemented to achieve good condition of the steelhead population in the Santa Ynez River. Unless the Deputy Director approves a time extension, right holder shall submit the summary report one year after the final study report is submitted.
23. Right holder shall evaluate the following in each study required in term 24:
 - (1) The extent to which the measure could benefit steelhead and other public trust resources;
 - (2) The technical and regulatory feasibility of the measure;
 - (3) The costs of the measure;
 - (4) Any potential impacts of the measure, including potential impacts to water quality, fishery resources, water supplies; and

(5) Any other study-specific criteria indicated below.

24. Right holder shall, at a minimum, conduct the following studies to evaluate measures that may be necessary to keep the steelhead fishery in the Santa Ynez River below Bradbury Dam in good condition at the individual, population, and community level and shall be informed by current scientific information on southern California steelhead recovery, including NMFS' 2012 Final Southern California Steelhead Recovery Plan:

- a. Study and evaluate options for providing steelhead passage of adults and smolts around Bradbury Dam including: fish ladders, locks, elevators, and trap-and-truck operations, including associated collection facilities. The study shall also include, but shall not be limited to, an evaluation of reservoir outlet works, collectors, transport methods, and upstream and downstream release sites. Unless the Deputy Director provides for a variation, the study shall conform to the Santa Ynez River Fish Passage Feasibility Analysis submitted by NMFS (on February 16, 2004) and CDFW (on February 17, 2004) during this proceeding. Right holder shall complete and submit a report on the results of the study to the Deputy Director, CDFW, and NMFS within 24 months from the date of this Order.

- b. Conduct an instream flow study to determine conditions necessary to keep the steelhead in the Santa Ynez River watershed in good condition at the individual, population, and community levels. This study shall include analyses of both flow and non-flow measures that could improve the quantity and quality of steelhead habitat. At a minimum, the study must:
 - (1) Evaluate the flow conditions necessary to protect each stage of the steelhead life cycle and maintain the abundance, productivity, genetic and life history diversity, and spatial structure of the population, including an evaluation of the needed frequency, duration, timing, and rate of change of flows for the protection of steelhead and other native species;

- (2) Assess the flow conditions necessary to ensure hydrologic connectivity and opportunities for movement between the habitats needed by each stage of the steelhead life cycle, including tributary access, and appropriate channel morphology and sediment transfer that will provide sufficient habitat to keep steelhead in good condition;
 - (3) Assess potential instream or streamside habitat restoration measures and the potential effects on quantity and quality of steelhead habitat in relation to flow;
 - (4) Evaluate water quality issues that may impact steelhead including but not limited to elevated temperatures, low dissolved oxygen, and sediment transport and potential measures to address these issues;
 - (5) Evaluate operational changes to Bradbury Dam that could improve steelhead conditions; and
 - (6) Evaluate whether the timing of releases made pursuant to Water Rights Order 89-18 should be revised.
- c. Study and evaluate the effects of predation, particularly by piscivorous (fish-eating) fish, and nonnative species on steelhead in the Santa Ynez River, and measures that could be implemented to reduce the impacts of those species on steelhead in the river. The study shall specifically evaluate the effects of flows, including but not limited to Table 2 Flows, on supporting habitat conditions that reduce predation and the proliferation of nonnative species, as well as reasonable measures to prevent the introduction or reintroduction of invasive species. In addition, the study shall determine the effects of beaver dams on passage opportunities and distribution of steelhead and measures that could be implemented to reduce any impacts on steelhead in the river from beavers.
25. Right holder shall use either a gauge or methodology satisfactory to CDFW and NMFS and approved by the Deputy Director to maintain a continuous record of the

daily instream flows in the Santa Ynez River at Highway 154 and at Alisal Road, or other sites that the Deputy Director deems suitable, sufficient to document compliance with the terms of this permit. The Deputy Director may require revisions to the methodology or frequency of recording upon a showing of good cause and written agreement from CDFW and NMFS. Unless the Deputy Director approves a variation, right holder shall make instream flow records available daily on a publicly accessible website on as close to a real-time basis as feasible.

26. Right holder shall implement the monitoring program described in the 2000 Revised Biological Assessment, taking into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion, with consideration of other existing monitoring programs including the California Coastal Salmonid Monitoring Plan. The Deputy Director may amend the monitoring requirements to require additional monitoring or refine existing requirements.
27. Right holder shall submit a report and all supporting data by December 31 of each year that documents right holder's compliance with all permit terms for the previous water year ending September 30. To document compliance with term 15, right holder shall submit annually to the Deputy Director the document produced in accordance with paragraph (1) of the term and condition that implements Reasonable and Prudent Measure No. 11 of the 2000 Biological Opinion. These reports and all supporting data shall be submitted to the Division of Water Rights in a format designated by the Deputy Director and shall be made readily available on a publicly accessible website. The Deputy Director may amend reporting requirements to determine compliance with all permit terms.
28. The State Water Board reserves authority to modify the terms of this permit as set forth below to the extent necessary and appropriate to implement Water Code section 100 and the public trust doctrine:
 - a. The Executive Director may adjust the Table 2 Flows required by term 16 of this permit.

- b. The State Water Board may require right holder to implement any measures to restore or improve fish passage, control predators and nonnative species, or to improve habitat that may be necessary to keep steelhead in good condition. Any subsequent determination concerning the flows or other measures necessary to protect public trust uses and keep fish in good condition should be made with the benefit of the study of the effects of the Table 2 Flows and the results of the studies required by term 24 and any other information available at the time, and shall be made in accordance with section 780 of title 23 of the California Code of Regulations. Right holder shall implement any changes to flow requirements or other required measures in accordance with any time schedule established by the State Water Board once right holder has obtained any necessary regulatory approvals.
 - c. Upon a showing of good cause by right holder, NMFS, and CDFW, the Executive Director may authorize right holder to implement measures that can achieve and keep steelhead in the Santa Ynez River in good condition instead of meeting some or all of the Table 2 Flows. Prior to implementation, right holder shall obtain NMFS's and CDFW's approvals of final project designs.
29. The State Water Board reserves continuing authority to modify this order for conformity with any future Biological Opinion that may be issued regarding the Santa Ynez River steelhead fishery or any modification to the 2000 Biological Opinion.
30. If right holder anticipates a violation of any of these terms or conditions or if a violation has occurred, right holder shall provide immediate written notification to the Deputy Director and shall make these notifications readily available on a publicly accessible website.
31. The Executive Director and Deputy Director shall comply with the California Environmental Quality Act Guidelines (California Code of Regulations, Title 14,

Division 6, Chapter 3, Sections 15000-15387) when exercising delegated authority under this Order.

32. Nothing in this Order shall be construed to modify or authorize modification of United States Bureau of Reclamation's independent obligations under the federal Endangered Species Act (16 U.S.C. §§ 1531-1544).

IT IS FURTHER ORDERED that Permits 11308 and 11310 are amended to include the following new conditions, as set forth below:

33. Right holder shall implement an Oak Woodland Restoration Plan that will achieve a 2:1 replacement ratio of the oak trees 20 years after the first Cachuma surcharge event.
34. Right holder shall work diligently to revise its April 14, 1996 contract with Santa Barbara County Water Agency to the extent necessary to require the Member Units (the City of Santa Barbara; Goleta Water District; Montecito Water District; Carpinteria Valley Water District; and the Santa Ynez River Water Conservation District, Improvement District No. 1) to implement the water demand management measures identified as part of the urban water shortage contingency analyses contained in their urban water management plans. To the extent authorized by law, right holder shall require the Member Units to implement the measures in accordance with the Member Units' urban water management plans, as they may be amended. Right holder shall submit annual status reports to the Deputy Director describing efforts to negotiate a new contract with Santa Barbara County Water Agency. In the event that right holder does not succeed in revising its contract with Santa Barbara County Water Agency in conformity with this term by December 31, 2020, the Board reserves continuing authority to amend Permits 11308 and 11310 (Applications 11331 and 11332) to achieve water use reductions comparable to the Member Units' water demand management measures and delegates that authority to the Deputy Director.

35. Right holder shall submit annual status reports to the Deputy Director describing efforts to make new water supplies and conserved water available to the Member Units. The report shall include, but need not be limited to, right holder's and the Member Units' activities. The report shall include, but need not be limited to, an update on the operational status and capacity of the City of Santa Barbara's desalination plant and the operational status of any other desalination, recycled water, transfers, demand management, reservoir surcharging, or other new sources of supply for the Member Units that may be proposed in the future. Nothing in this Order shall be construed as an approval or endorsement of any water supply project or source of supply. The Deputy Director may modify this term's water conservation reporting requirements for consistency with water conservation reporting requirements adopted pursuant to a regulation or informational order issued pursuant to section 10609.28 of the Water Code.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a decision duly and regularly adopted at a meeting of the State Water Board held on _____.

Jeanine Townsend
Clerk to the Board

11.0 APPENDICES

APPENDIX 1 - FIGURES

Figure 1

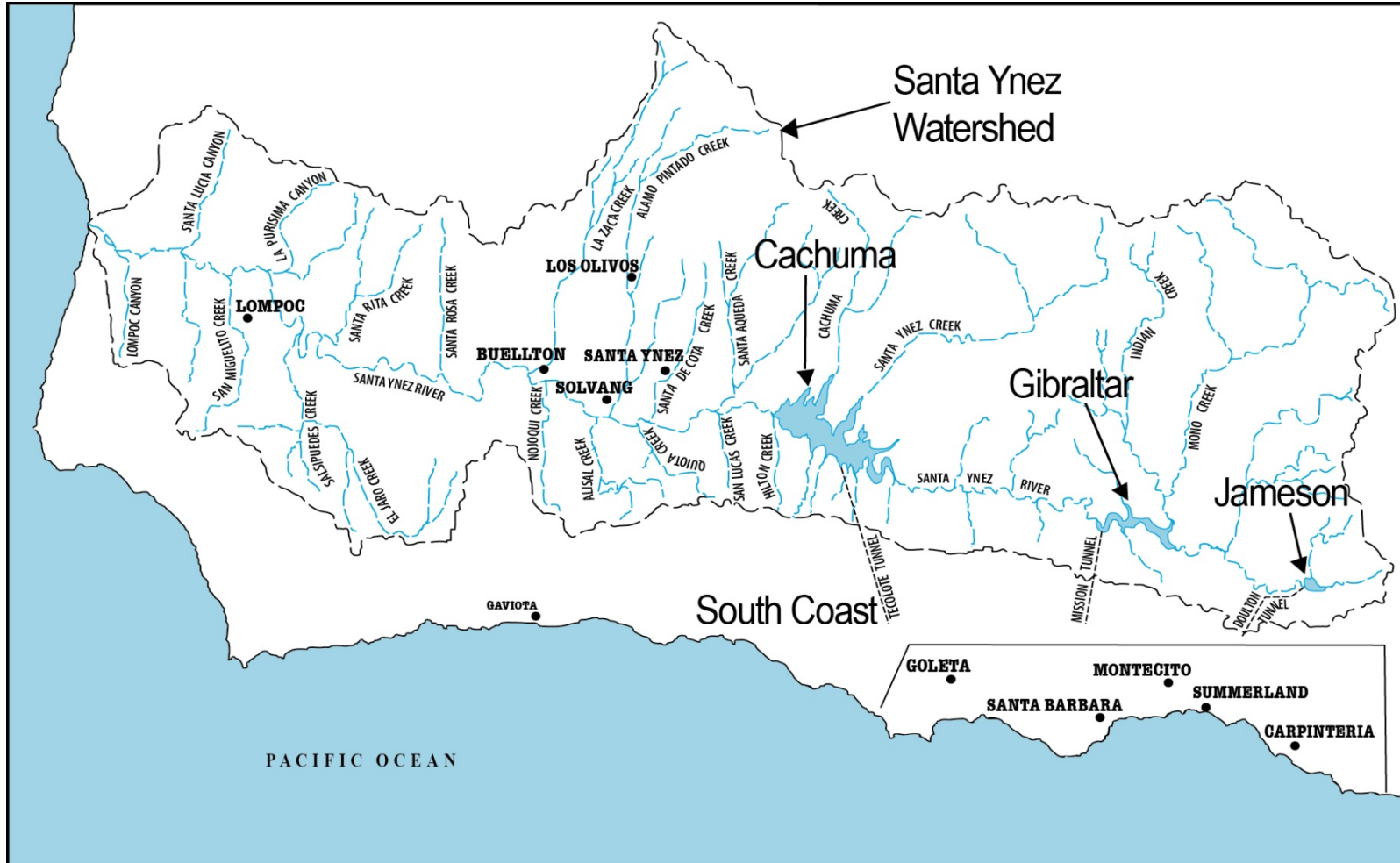


Figure 2

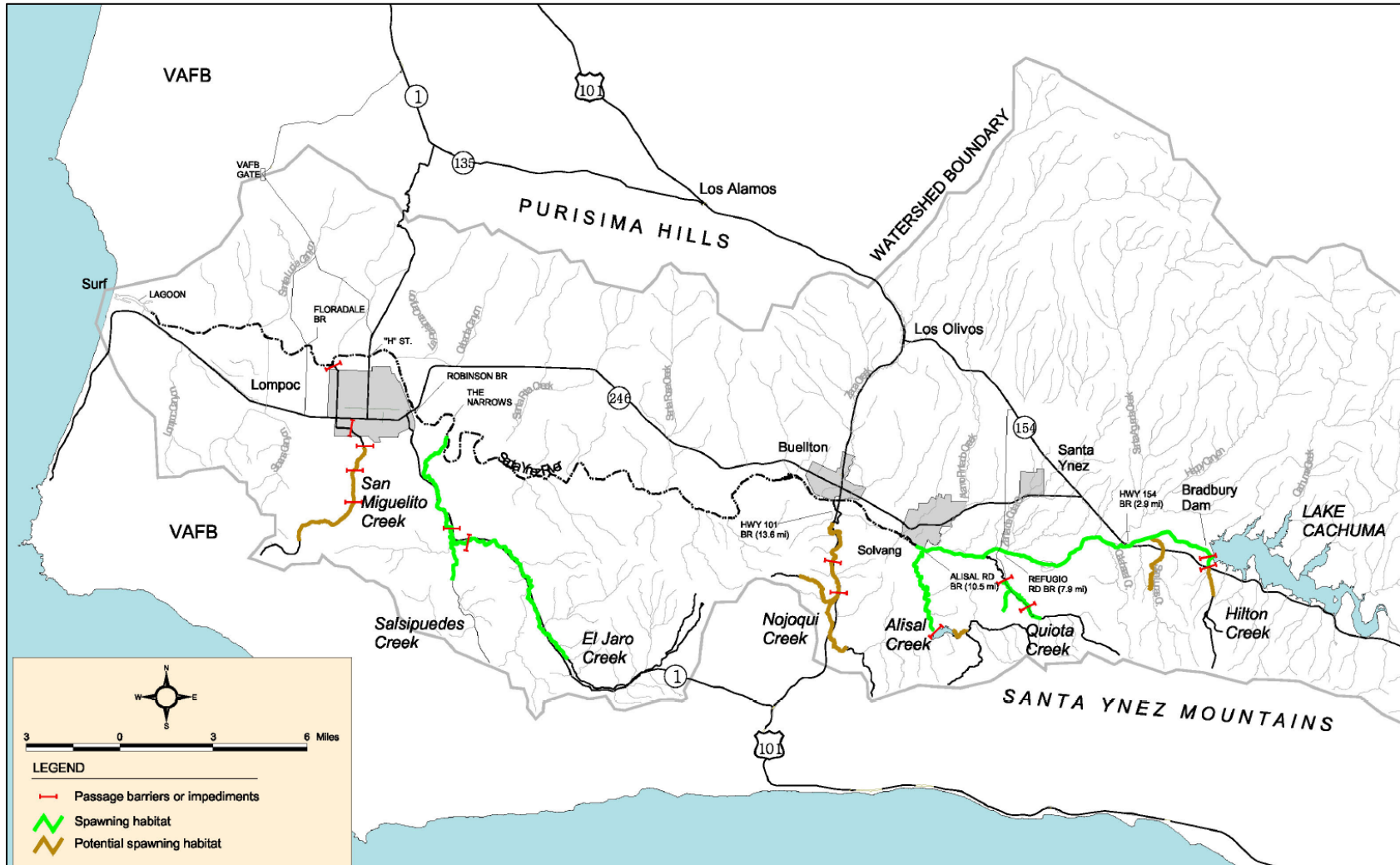


Figure 3

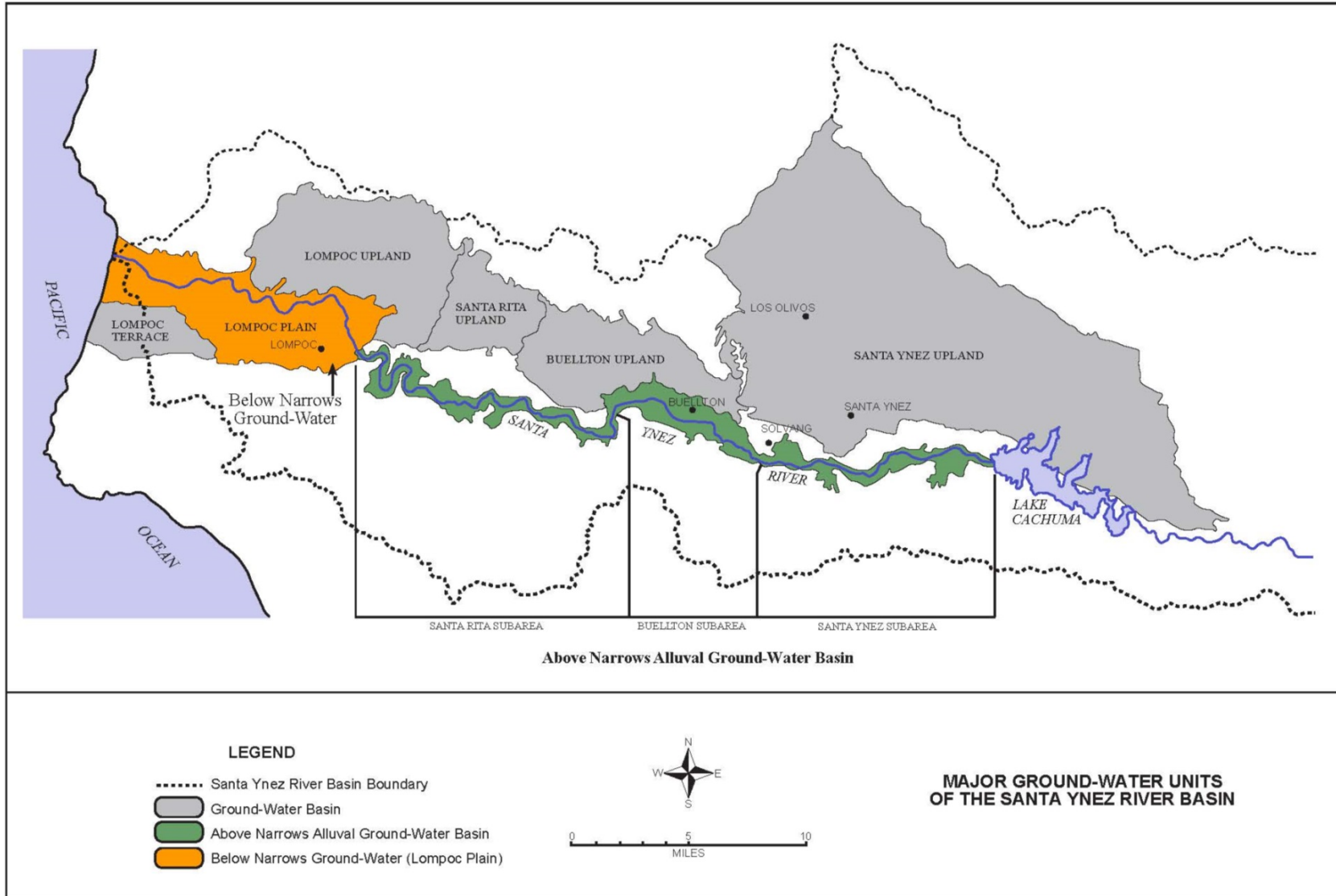
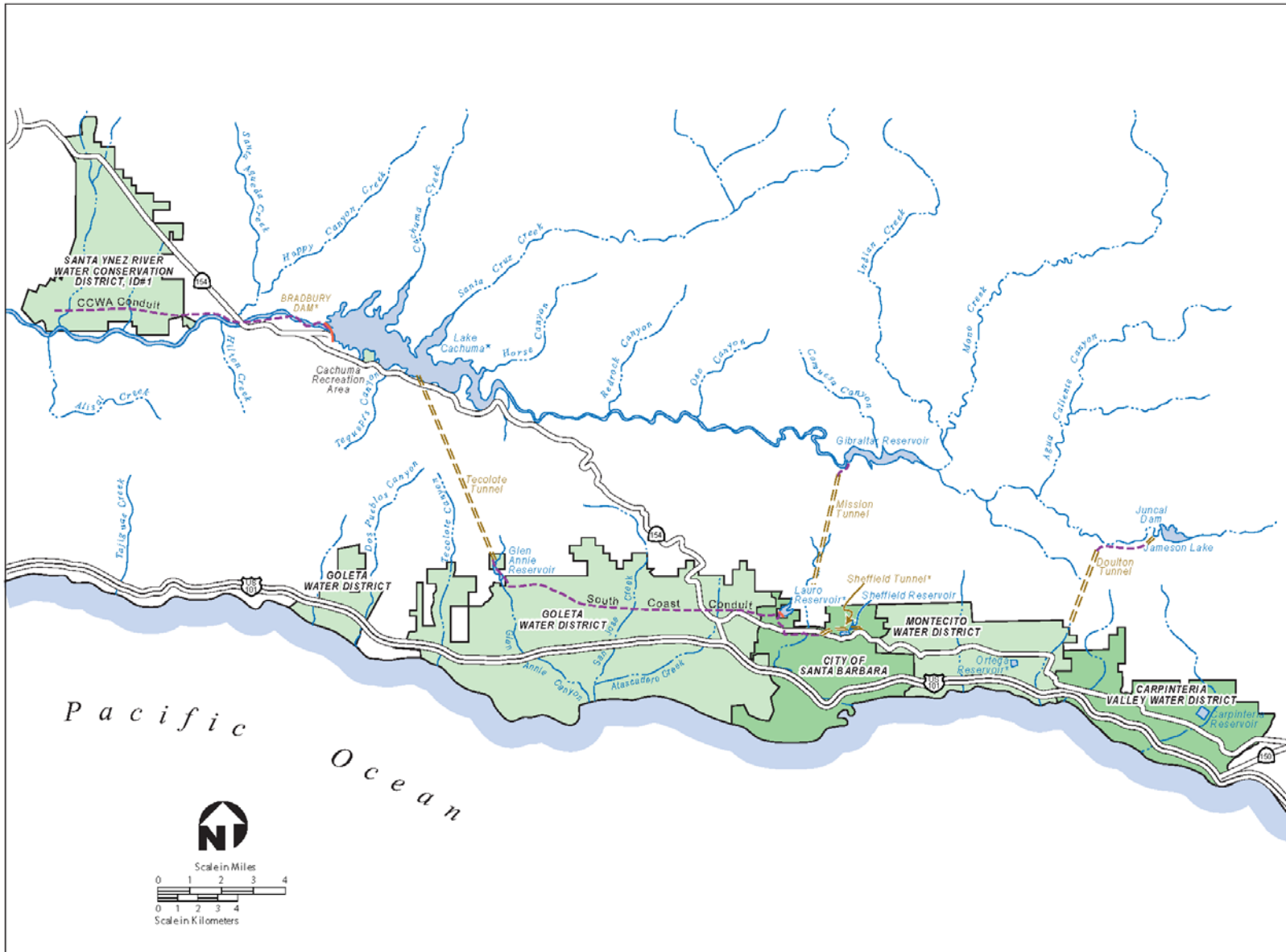


Figure 4



**APPENDIX 2 -
SEPTEMBER 17, 2002
SETTLEMENT AGREEMENT**

**SETTLEMENT AGREEMENT BETWEEN
CACHUMA CONSERVATION RELEASE BOARD,
SANTA YNEZ RIVER WATER CONSERVATION DISTRICT,
SANTA YNEZ RIVER WATER CONSERVATION DISTRICT
IMPROVEMENT DISTRICT NO. 1, AND THE CITY OF LOMPOC,
RELATING TO OPERATION OF THE CACHUMA PROJECT**

This Agreement is entered into this 17th day of December, 2002, by and between , **CACHUMA CONSERVATION RELEASE BOARD (“CCRB”)**, a joint powers agency consisting of the City of Santa Barbara, Montecito Water District, Goleta Water District and Carpinteria Valley Water District (**“CCRB Members”**), **SANTA YNEZ RIVER WATER CONSERVATION DISTRICT**, a California water conservation district (**“Santa Ynez”**), **SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1**, an improvement district of Santa Ynez (**“ID#1”**), and the **CITY OF LOMPOC**, a general law city (**“Lompoc”**).

EXPLANATORY RECITALS:

A. The United States Bureau of Reclamation (“USBR”) has constructed and is operating the Cachuma Project as authorized by the Congress of the United States, including Lake Cachuma impounded behind Bradbury Dam, and operates the Cachuma Project pursuant to permits issued by the State Water Resources Control Board (“State Board”) and, pursuant to permits and orders of the State Board, is required to, among other things, collect certain data, maintain essential records related to project operations, and to make releases below Bradbury Dam for the protection of downstream water rights; and

B. CCRB Members and ID#1 have contracted with USBR through the Santa Barbara County Water Agency for the yield from the Cachuma Project, and are collectively referred to as “Cachuma Member Units”. CCRB is established by that certain “Joint Powers

Agreement Creating Cachuma Conservation-Release Board” dated February 11, 1974, for specific purposes, including to represent the CCRB Members in promoting their common objective to maximize for beneficial use the water supply made available from the Cachuma Project; and

C. Santa Ynez, among other things, acts to represent and protect holders of water rights downstream of Bradbury Dam so that the Cachuma Project does not interfere with downstream water rights nor adversely affect water quality of the Santa Ynez River; and

D. ID#1, located downstream of Bradbury Dam and within Santa Ynez, among other things, acts to help ensure sufficient water is released so as to protect its downstream water rights, and as a Member Unit of the Cachuma Project, seeks to maximize the yield of the Cachuma Project for beneficial use within its boundaries; and

E. Lompoc, located downstream of Bradbury Dam and within Santa Ynez, acts to, among other things, help ensure that sufficient water is released so that the Cachuma Project does not interfere with its downstream water rights nor adversely affect the quality of water recharged from the Santa Ynez River; and

F. In furtherance of Order WR 94-5, by Notice dated September 25, 2000, the State Board noticed hearings concerning “Hearing to Review the US Bureau of Reclamation Water Right Permits 11308 and 11310 (Applications 11331 and 11332) to Determine Whether any Modifications in Permit Terms and Conditions are Necessary to Protect Public Trust Values and Downstream Water Rights on the Santa Ynez River below Bradbury Dam (Cachuma Reservoir) and to Consider Change Petitions for Water Rights Permits 11308 and 11310”; the first phase of which hearing concerning proposed Change in Place and Purpose of Use Petitions was conducted on November 6, 2000; and a second phase of said hearing is anticipated in the Spring of 2003 will consider whether changes in said Permit terms and conditions are necessary

to protect public trust resources and downstream water rights (said hearings herein being collectively referred to as "94-5 Hearings"); and

G. The parties to this Agreement along with others, including the California Department of Fish and Game and the United States Fish and Wildlife Service, have entered into a series of Memoranda of Understanding, the last effective December 1, 2000 ("Fish MOU"), in order to develop a consensus process to address public trust resource issues affected by the Cachuma Project. Further purposes of the Fish MOU are to implement the Lower Santa Ynez River Fish Management Plan ("FMP") and the Terms and Conditions of the United States National Marine Fisheries Service Biological Opinion ("NMFS BO") entitled "U. S. Bureau of Reclamation operation and maintenance of the Cachuma Project on the Santa Ynez River in Santa Barbara County, California", dated September 11, 2000 pursuant to Section 7 of the Endangered Species Act. Among other things, the parties to this Agreement intend by this Agreement to jointly advocate for the State Board to issue orders for the future operation of the Cachuma Project as provided at Paragraph 4 hereof; and

H. It is the desire of the parties to this Agreement to resolve actual and potential disputes which exist among them relative to the obligation of USBR to make releases from Bradbury Dam for protection of downstream water rights such that entering into Phase 2 of the 94-5 Hearings, the parties to this Agreement are in agreement that, subject to potential termination as provided at Paragraph 5 hereof, the downstream water rights holders are protected and that the State Board need not take any additional actions in protection of downstream water rights holders at this time; and

I. The parties to this Agreement, all of which have been involved in the consensus process leading to the Fish MOU to protect public trust resources, desire to coordinate the protection of public trust resources and downstream water right releases so as to provide for

protection of such public trust resources and maximize the beneficial use of water from the Santa Ynez River, all in a manner consistent with the FMP and the Terms and Conditions of the NMFS BO; and

J. In conjunction with the 94-5 Hearings, the State Board is expected to consider and certify an Environmental Impact Report which will consider the environmental effects of any changes in the terms and conditions of the Cachuma Project permits, including certain modified operations set forth in this Agreement.

EXECUTORY AGREEMENTS:

NOW, THEREFORE, in consideration of the above recitals and the mutual promises made herein, the parties to this Agreement agree as follows:

1. Downstream Water Rights Releases

1.1 Support of WR 89-18.

The parties to this Agreement agree that releases pursuant to State Board Order WR 73-37 as modified by WR 89-18 (herein collectively called "WR 89-18") and modified as provided in this Agreement will adequately protect downstream water rights and will not significantly adversely affect water quality otherwise available to downstream water right holders and collectively agree to support WR 89-18 and the modifications as provided in this Agreement before the State Board, as the appropriate mechanism for administering downstream water rights releases. The parties to this Agreement agree to advocate for, to be bound by, to comply with, and not to seek judicial challenge, of a State Board order to operate the Cachuma Project according to WR 89-18, modified as provided in this Agreement.

1.2 Conjunctive Operation with Fish Releases.

For purposes of operating downstream water rights releases in conjunction with releases required under the NMFS BO in a manner to reduce the impacts on

the Cachuma Project water supply, while meeting the target rearing flows required by the NMFS BO, which is an obligation of the Cachuma Project, Santa Ynez shall order downstream water rights releases pursuant to Condition 5 of WR 89-18 (modifying condition No. 5 of Permits 11308 and 11310) consistent with Exhibit "A" hereto.

1.3 Conjunctive Operation of Below Narrows Account.

In order to resolve a dispute which may exist between all or some of the parties to this Agreement as to whether and under what conditions "Curve B" may apply in lieu of "Curve A" insofar as determining Below Narrows Account ("BNA") credits as provided in Paragraph 2.2.1 of Condition 5 of WR 89-18, the parties to this Agreement agree that BNA credits shall be computed as set forth in Exhibit "B" hereto. This arrangement shall include, under circumstances described in Exhibit B, the availability of "Accumulated Drought Water Credits" from the BNA for the benefit of the Cachuma Member Units under conditions therein described.

1.4 Technical Amendments to WR 89-18.

In order to accommodate changed circumstances and in furtherance of implementation of paragraphs 1.2 and 1.3 of this Agreement, the parties to this Agreement shall jointly support the technical amendments set forth at Exhibit "C" hereto as modifications to be made to WR 89-18.

1.5 Deliveries During Releases.

The parties to this Agreement will, as provided in Exhibit D, make best efforts to maximize the delivery by the Central Coast Water Authority ("CCWA") of State Water Project (SWP) water with lower concentrations of total dissolved solids ("TDS") into the outlet works at Bradbury Dam during WR 89-18 water rights releases consistent with the NMFS BO. This will be accomplished through the commingling of SWP water with WR 89-18 water rights releases in

the outlet works of Bradbury Dam when downstream water rights releases are being made. Generally, SWP deliveries by CCWA are of lower TDS concentrations compared to water released from Lake Cachuma under WR 89-18. The objective of such commingling operations is to maximize the delivery of SWP Water to lower the TDS in the lower Santa Ynez River and at the Narrows. Such coordinated program shall be carried out as set forth in Exhibit "D" hereto.

1.6 Subsequent Review of Conjunctive Operations.

The conjunctive operation provisions of Paragraph 1.2, 1.3 and 1.5 will be reviewed and evaluated at the end of a ten (10) year period following this Agreement becoming effective and may thereafter be revised upon mutual agreement of Santa Ynez, ID #1, Lompoc and CCRB, with the concurrence of USBR and State Board when applicable. If a party requests a revision of this Agreement following such review, and cannot reach agreement with the other parties within 180 days of the request, the matter will then be submitted to a mediator mutually agreeable to the parties to this Agreement. If after ninety (90) days the mediation effort is unsuccessful or the parties cannot agree on a mediator, any party may then request that the State Board review the matter in the manner provided by law. In order to seek a revision, a party must demonstrate by substantial evidence that the objectives of Paragraph 1.2, 1.3 or 1.5 are not being met.

2. Modified Winter Storm Operations.

The parties to this Agreement support USBR's adoption and continued use of "Modified Winter Storm Operations" as described in USBR Technical Memorandum No. WR-8130-RA-TM-00-2, entitled "Risk Based Evaluation, Modified Storm Operations-Bradbury Dam", dated February, 2000 and the Santa Barbara County Water Agency report entitled "Report of Modified Storm Operations, Bradbury Dam, Cachuma Project, Santa Barbara County, California", dated December 29, 1998.

3. Resolution of Litigation and Claims by City of Lompoc.

3.1 Lompoc hereby waives and forever discharges USBR and the parties to this Agreement from all of its existing financial damage claims relative to impacts of the operation of the Cachuma Project upon Lompoc water rights and upon TDS of water quality in the Lompoc groundwater basin based upon: (a) alleged injury prior to the date of this Agreement, and (b) alleged injury after the date of this Agreement during such times as this Agreement is in effect and during such time as a matter related to Paragraph 1.5 has not been referred to the State Board pursuant to Paragraph 1.6.

3.2 Lompoc hereby withdraws its protest to the Cachuma Project Change in Place and Purpose of Use presented in connection with Phase 1 of the 94-5 hearings.

4. Protection of Public Trust Resources.

The parties to this Agreement will mutually support before the State Board in Phase 2 of the 94-5 Hearings the Terms and Conditions of the NMFS BO and the FMP as the preferred operational program for the Cachuma Project in order to address public trust resource issues.

5. Effective Date and Termination.

5.1 This Agreement shall be deemed effective upon the date first stated above, provided that Paragraphs 1.2, 1.3 and 1.4 shall not become effective until the State Board issues an order or adopts a decision amending the terms and conditions of the USBR's water right permits confirming that downstream water rights releases will continue to be made consistent with WR 89-18, as modified by the technical changes enumerated at Exhibit "C" hereto, without any material change.

5.2 This Agreement shall terminate and shall be of no further force and effect if (i) the State Board, following the completion of the hearing required by Order WR 94-5,

issues an order that does not require that downstream water rights releases continue to be made consistent with WR 89-18, as modified by this Agreement, without any material change, and (ii) within 90 days of finalizing any State Board order under (i), any party provides written notice to the other parties of invoking this Paragraph 5.2.

6. Standard Provisions.

6.1 Notices.

Notices may be given to the parties to this Agreement and interested entities by mailing written notice, with first class postage prepaid, as follows (except as a party may provide written notice to all of the parties to this Agreement of a change of address):

To: United States Bureau of Reclamation
Attention: Regional Water Rights Officer
2800 Cottage Way, Room E-2903, MP440
Sacramento, CA 95825

Cachuma Conservation Release Board
Attention: Manager
3301 Laurel Canyon Road
Santa Barbara, CA 93105

Santa Ynez River Water Conservation District
Attention: General Manager
P. O. Box 719
Santa Ynez, CA 93460-0719

Santa Ynez River Water Conservation District,
Improvement District No. 1
Attention: District Manager
P. O. Box 157
Santa Ynez, CA 93460

City of Lompoc
Attention: City Administrator
City Hall, 100 Civic Center Plaza
Lompoc, CA 93436

6.2 **Headings.**

The titles and headings of this Agreement are for purposes of convenience only, and shall be given no substantive meaning in interpreting this Agreement.

6.3 **Counterparts.**

This Agreement may be executed in counterparts and as so executed shall constitute one agreement which shall be binding on all parties to this Agreement notwithstanding that all parties to this Agreement are not signatory to the original or the same counterpart.

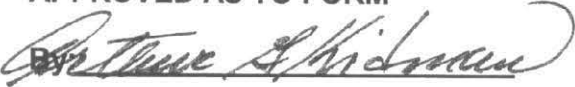
6.4 **California Law Applies.**

This Agreement shall be construed pursuant to the laws of the State of California.

CACHUMA CONSERVATION RELEASE BOARD

By: 

APPROVED AS TO FORM

By: 

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: _____

APPROVED AS TO FORM

By: _____

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1

By: _____

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CACHUMA CONSERVATION RELEASE BOARD

By: _____

APPROVED AS TO FORM

By: _____

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT

By: _____

APPROVED AS TO FORM

By: _____

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1

By: Harley J. Burchard

APPROVED AS TO FORM

By: Gregory H. Wickham

CITY OF LOMPOC

By: _____

APPROVED AS TO FORM

By: _____

APPROVED AS TO FORM

By: _____

APPROVED AS TO FORM

By: *David J. [Signature]*

CITY OF LOMPOC

By: *[Signature]*

Exhibit A

PROCEDURES FOR CONJUNCTIVE OPERATION WITH FISH RELEASES

The purpose of operating the downstream water right releases in conjunction with the fish water releases is to reduce the impacts on the Cachuma Project water supply while meeting the target rearing flows described by the United States National Marine Fisheries Service Biological Opinion (“NMFS BO”).

The downstream water right releases contributing to the conjunctive use operations consist of either releases from the Above Narrows Account or combined releases from the Above and Below Narrows Accounts. To assure that the downstream water right releases in the future (including with the Lake Cachuma surcharge) are similar to the historical practices, the following criteria are adopted:

1. Santa Ynez will cause downstream water right releases to be made that will also meet the target rearing flows in the mainstream of Santa Ynez River as required by the NMFS BO for an average of 65 days per year in years which are Designated for Water Right Releases, as described below in Paragraph 3.
2. The ten-year moving average of 65 days shall be the average of the most recent 10 years Designated for Water Right Releases. For the purpose of calculating the ten-year moving average, the initial year shall start in 1985.
3. For the purpose of the above calculations, all years are “Designated for Water Right Releases” except: (a) a year with a spill from Lake Cachuma exceeding 20,000 acre-feet; (b) a year immediately following the spill year with the spill amount exceeding 100,000 acre-feet; and (c) a year when there is less than 30,000 acre-feet of storage in Lake Cachuma.

4. To the extent water right releases are made in those years that are not Designated for Water Right Releases, then the number of days with water right releases shall be added to the next designated year.
5. In the event the ten-year moving average is calculated to be less than 65 days in a year when the storage in the Lake is less than 100,000 acre-feet (elevation 714.00 feet¹ m.s.l.), additional releases from the Above Narrows Account shall be made to meet the target rearing flows at the Hwy. 154 Bridge for the number of days necessary to raise the calculated ten-year average to 65 days. Such releases shall not be required when the storage in the Lake is more than 100,000 acre-feet (elevation 714.00 feet m.s.l.).
6. In a month when Lake Cachuma inflow is calculated by the USBR to be less than 25 acre-feet and no downstream water right releases are made in that month, releases up to 25 acre-feet from the Above Narrows Account shall be made in the following month to meet the target rearing flows required by the NMFS BO at the Hwy. 154 Bridge or Alisal Bridge, whichever is in effect. Such releases are included in the calculation of the ten-year moving average. Provisions of this paragraph do not apply when the storage in the Lake is less than 30,000 acre-feet.
7. Nothing in this Settlement Agreement or this Exhibit affects or diminishes the provision of Paragraph 1.6 of Condition 5 of SWRCB Order WR 73-37.

¹ Lake Cachuma bathymetric survey of year 2000

Exhibit B

PROCEDURES FOR CONJUNCTIVE OPERATION OF BELOW NARROWS

ACCOUNT

1. With respect to calculation of Below Narrows Account (BNA) credits as provided at Paragraph 2.2 of Condition 5 in WR 89-18, BNA credits shall be computed using the Upper Curve (Curve A) at all times and the credits are accrued to the BNA. (Curve A (Upper Curve) and Curve B (Lower Curve) herein referred to are depicted in USBR Exhibit 1, Attachment E, dated December 1, 1988, referenced in said Paragraph 2.2.)
2. When the accumulated flow at the Narrows at the beginning of a month exceeds 50,000 acre-feet for that Water Year (October 1 through September 30), the use of the Lower Curve (Curve B) is triggered for the purpose herein provided. The difference in the credit amount between the Upper and Lower Curves will be calculated in that month and each subsequent month in that Water Year and is referred to as the "Upper Curve Water" ("UCW").
3. Cachuma Member Units shall accumulate a drought water credit equal to one-half of the UCW, except as provided in Paragraph 6. Such accumulated credits shall be called the Accumulated Drought Water Credit (ADWC) and shall not exceed a total of 3,200 acre-feet.
4. The ADWC shall be reduced proportionately when there is a spill reduction in the Below Narrows Account as provided in Paragraph 2.7 of Condition 5 in WR 89-18.
5. When the storage level in Lake Cachuma is less than 100,000 acre-feet (elevation 714.00 feet¹ m.s.l.), any BNA water in Lake Cachuma up to the ADWC shall be

held and made available to the Cachuma Member Units if and when they so notify USBR while the reservoir remains below the 100,000 acre-feet (elevation 714.00 feet m.s.l.) level for the purpose of reducing Project shortages. To the extent such BNA water is used to reduce Project shortages, the ADWC shall be reduced .

6. If the BNA water in the Lake is less than the ADWC when the storage level in Lake Cachuma is less than 100,000 acre-feet (elevation 714.00 feet m.s.l.), one-half of BNA credits created while the Lake remains below the 100,000 acre-feet (elevation 714.00¹ feet m.s.l.) level shall be held and made available to the Cachuma Member Units up to the ADWC and consistent with the provisions of Paragraph 5.
7. Upon the effective date of Paragraph 1.3 of the Settlement Agreement, an amount equal to 1,500 acre-feet of the BNA water shall be credited to the Cachuma Member Units as the initial ADWC. After the effective date of Paragraph 1.3 of the Settlement Agreement, and prior to the occurrence of the first spill from Lake Cachuma the initial ADWC shall be reduced to the extent UCW is accumulated in the ADWC pursuant to Paragraph 3. In any event, with the occurrence of such first spill after the effective date of Paragraph 1.3 of the Settlement Agreement, the amount remaining in the initial ADWC shall be reduced to zero.
8. The amount of deduction from the BNA for the last five years as set forth in Paragraph 2.2.1 of Condition 5 of WR 89-18 and Attachment F of USBR Exhibit 1 referenced in Paragraph 2.2.1 is deemed to be zero.

¹ Lake Cachuma bathymetric survey of year 2000.

Exhibit C

TECHNICAL AMENDMENTS TO WR 89-18

Explanation of Technical Amendment No. 1

Since 1993, water has been released from Lake Cachuma for the purpose of studying and maintaining fish habitat in the upper part of the Santa Ynez River downstream of Bradbury Dam. As a result of such releases, a flow condition has been created in the Santa Ynez River at the San Lucas Bridge (Highway 154 bridge) and at other downstream locations. In consideration of Paragraph 1.4 of Condition 5 of SWRCB Order WR 89-18 and in consultation with Santa Ynez, the USBR moved the live stream observation in the Santa Ynez River at the San Lucas Bridge (Hwy. 154) to near the Hwy 154 crossing of San Lucas Creek (near Hwy. 154 crossing of the Santa Ynez River) in 1993. San Lucas Creek is the main tributary to the Santa Ynez River immediately upstream of the San Lucas Bridge.

As a result of fish water releases under the United States National Marine Fisheries Service Biological Opinion ("NMFS BO"), the parties have considered the proper application of Paragraph 1.4 of Condition 5 of SWRCB Order WR 89-18. The parties have agreed to the following amendments to WR 89-18:

Technical Amendment No. 1

(1.) Insert the following at the bottom of Paragraph 1.4 of Condition 5 of WR 89-18:

"In addition, fish water released for maintenance of habitat, adaptive management and passage flows in the Santa Ynez River which is in transit between Bradbury Dam and the Narrows shall not be considered to be surface flow of the Santa Ynez River. When such fish water releases are made and flow measured in San Lucas Creek at the Highway 154 crossing

is less than 0.3 cfs, the live stream in the Santa Ynez River at the San Lucas Bridge (river mile 45.7) is deemed to be non-existent."

"When fish water releases are made and there is a visible stream of water flowing on the surface of the Santa Ynez River bed at the San Lucas Bridge (river mile 45.7), at the Mission Bridge near Solvang (river mile 38), at U.S. Highway 101 Bridge near Buellton (river mile 34.31), at the Santa Rosa damsite (river mile 25.3) and at Robinson Bridge near Lompoc (river mile 12.9), the flow measured at the Narrows Gage is adjusted as provided in Attachment H to USBR Exhibit 1, dated December 1, 1988, entitled "Correlation of Flow at Narrows to Live Stream Conditions Between the Narrows and Floradale Avenue" to meet the criteria for a live stream condition.

(2.) Add a third paragraph on Page 1 of said Attachment H to Exhibit 1 of the USBR to provide as follows:

"When fish water releases are made and there is a visible stream of water flowing on the surface of the Santa Ynez River bed at the San Lucas Bridge (river mile 45.7), at the Mission Bridge near Solvang (river mile 38), at U. S. Highway 101 Bridge near Buellton (river mile 34.31), at the Santa Rosa damsite (river mile 25.3) and at Robinson Bridge near Lompoc (river mile 12.9), the flow measured at the Narrows for the current day is reduced by: (i) an amount equal to one half of fish water released from Lake Cachuma during the same day or (ii) the amount of flow measured near the Mission

Bridge (Solvang) during the same day, whichever is less. If the adjusted measured flow at the Narrows for the current day is less than zero, it is deemed to be zero. The adjusted daily flow measured at the Narrows is used as the measured flow at the Narrows for the current day in the attached tabulation. The accumulated daily flows from October 1 through the preceding day measured at the Narrows and the accumulated daily flows for the preceding ten (10) days measured at the Narrows are not adjusted for the fish releases and they are based on measured flows at the Narrows. The adjustment for the fish releases provided in this paragraph is not applicable if there is a spill from Lake Cachuma during the current day.”

(3.) Amend first sentence of item (p) under Condition 6 of WR 89-18 as follows:

“(p) A record of all daily flows and quality (as measured in EC/TDS) passing the Narrows as provided by the United States Geological Survey.”

(4.) Establish a measuring station on San Lucas Creek by adding the following item under Condition 6 of WR 89-18:

“(q) A record of flow in San Lucas Creek at the Highway 154 crossing.”

(5.) Provide daily flows of Santa Ynez River measured near the Mission Bridge (Solvang) by adding the following item under Condition 6 of WR 89-18:

“(r) A record of all daily flows and quality (as measured in EC/TDS) measured near the Mission Bridge (Solvang) as provided by United States Geological Survey.”

Explanation For Technical Amendment No. 2

As described in Paragraph 1.3 of the Settlement Agreement and its Exhibit B, the Conjunctive Operation with the Below Narrows Account is intended to resolve any issue relating to when Curve A or B as described in Paragraph 2.2.1 of Condition 5 in WR 89-18 and Attachment F of USBR Exhibit 1 should be used and the quantity of BNA water to be credited to the Project once a “trigger” for the Lower Curve is established. It is noted that this compromise continues the use of the Upper Curve for purposes of establishing BNA credits, but under certain conditions sets aside a portion of the BNA credits for the Cachuma Member Units to utilize when most needed, that is during dry conditions.

Technical Amendment No. 2

(1) Delete Paragraph 2.2.1 of Condition 5 set forth in WR 89-18 and Attachment F of USBR Exhibit 1 and modify the second paragraph in Attachment E of said USBR Exhibit 1 to provide as follows: “Curve B will not be used for the purpose of calculating the BNA credits”.

(2) Add as Paragraph 2.5.1 of Condition 5

“(2.5.1) Notwithstanding Paragraph 2.5, BNA water in Lake Cachuma up to the Accumulated Drought Water Credit (ADWC) shall be made available to the Cachuma Member Units when and so long as the Lake Cachuma storage level remains below 100,000 acre-feet in accordance with the “Procedures for Conjunctive Operation of Below Narrows Account” depicted on USBR Exhibit _____, dated _____, 2003.”

Explanation of Technical Amendment No. 3.

CCWA delivers SWP water to the South Coast through Lake Cachuma and Tecolote Tunnel.

Consistent with the measurements performed for the SWP deliveries, the following amendments are provided under Condition 6 of WR 89-18.

Technical Amendment No. 3

(1) Amend item (d) under Condition 6 of WR 89-18 as follows:

“(d) Daily inflow to Lake Cachuma, including underground flows, by proper computations of tunnel diversions, reservoir releases, spills, Central Coast Water Authority (CCWA) deliveries into Lake Cachuma, and change in storage.”

(2) Add item under Condition 6 of WR 89-18:

“(s) Continuous records of CCWA deliveries into Lake Cachuma

Exhibit D

PROCEDURES FOR MAXIMIZING DELIVERIES OF CCWA WATER TO LAKE CACHUMA DURING DOWNSTREAM WATER RIGHTS RELEASES

The following procedures will be undertaken:

1. On or about April 10 of each year, Santa Ynez shall provide to the USBR, CCRB, Lompoc and ID#1 a preliminary schedule estimating the number and duration of WR 89-18 water rights releases during the next twelve (12) months and indicating in which months anticipated releases will be made.
2. It is noted that SWP water is delivered to Lake Cachuma from the forebay of the Central Coast Water Authority (CCWA) Santa Ynez Pumping Plant. The pumping plant is equipped with five pumping units; only four units are required to pump the design flow of 22 cfs (5.5 cfs per pump) to Lake Cachuma and one unit is reserved as a standby pump. The present performance of the pumping units (about 7.5 cfs per pump) exceeds the design flow. Variations in the discharge rate from the pumping plant are accommodated through varying the number of pumps in operation.

CCRB Members shall request deliveries through the CCWA to maximize their deliveries of SWP water into Lake Cachuma during those months when water rights releases are scheduled as provided in Paragraph 1 above. This will be accomplished in the following manner: During the periods when downstream water rights releases are made: (i) CCRB Members through CCWA shall request deliveries of an amount of SWP water to the forebay of the Santa Ynez Pumping Plant at flow rates sufficient to ensure that at least two pumping units at the Santa

Ynez Pumping Plant are capable of delivering water to Lake Cachuma; and (ii) ID #1 shall coordinate with CCWA while preserving its scheduled deliveries of SWP water and Cachuma exchange water so as to facilitate the operation of at least two pumping units at the Santa Ynez Pumping Plant, as provided at Subparagraph (i) above.

3. The delivery of CCWA water to Lake Cachuma during downstream water rights releases, as provided for in Paragraphs 1 and 2 above, shall be subject to the following conditions:
 - A. In coordinating deliveries and water rights releases as provided for herein, CCRB Members and ID #1 shall not be required to take actions which are inconsistent with the annual quantities of SWP water and Cachuma exchange water which they otherwise would have ordered.
 - B. To the extent there is a failure in the CCWA delivery system, including the SWP facility, which prevents delivery of SWP water to Lake Cachuma, the coordination of deliveries shall not occur during the affected period and will not be made up in later periods.
 - C. The parties recognize that there is a limitation in the capacity of the CCWA pipeline to deliver SWP water to Lake Cachuma. To the extent the delivery capacity is increased in the future, such increase will enhance the deliveries of SWP water to the South Coast and at the same time should increase the amount of SWP water available for commingling when downstream water rights releases are made. In this regard, if the delivery capacity of the CCWA pipeline to the Santa Ynez Pumping Plant is

increased in the future, more than two pumping units should be available to be utilized during the WR 89-18 releases.

- D. Nothing in this Settlement Agreement or this Exhibit is intended to be inconsistent with the CCWA Water Supply Agreements.
- E. The parties recognize that blending restrictions imposed by the NMFS BO may limit the ability to commingle SWP water with downstream water rights releases.

- 4. The parties agree to periodically review operations under this Exhibit D and, if necessary, CCRB Members and ID#1 will make good faith operational adjustments to maximize SWP water deliveries to Lake Cachuma during WR 89-18 releases, consistent with the purposes of Section 1.5 of the Settlement Agreement and this Exhibit "D."