Chapter 1
Introduction

1.1 Introduction

The State Water Resources Control Board (State Water Board) is considering amendments to the 2006 *Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary* (2006 Bay-Delta Plan). The amendments would establish new flow objectives on the Lower San Joaquin River (LSJR)[1] and its three eastside tributaries[2] for the protection of fish and wildlife beneficial uses, new water quality (salinity) objectives for the protection of agricultural beneficial uses in the southern portion of the Sacramento–San Joaquin Delta (Delta), and a program of implementation to achieve those objectives. The new LSJR flow objectives and southern Delta water quality (SDWQ) objectives and associated program of implementation would replace the existing San Joaquin River (SJR) flow and southern Delta water quality objectives and associated program of implementation in the 2006 Bay-Delta Plan.

The State Water Board is currently conducting a phased evaluation of the 2006 Bay-Delta Plan. Phase I consists of a review and update of the current LSJR flow and southern Delta salinity objectives and associated program of implementation. Phase II consists of review and potential modification to other parts of the 2006 Bay-Delta Plan, including Delta outflows, State Water Project (SWP) and Central Valley Project (CVP) export restrictions, and other requirements in the Bay-Delta to protect fish and wildlife beneficial uses. This substitute environmental document (SED) analyzes environmental impacts associated with Phase I. Environmental impacts associated with Phase II will be evaluated in a separate environmental document. Subsequent Phase III proceedings will consider and assign responsibility for implementing measures to achieve the water quality objectives established in Phase I and Phase II, including changes to water rights or other implementation actions. The State Water Board anticipates preparing an environmental impact report (EIR) to evaluate environmental effects of the changes to water rights that may be required as part of Phase III to implement the amendments to the 2006 Bay-Delta Plan (Phase I and Phase II).

The purpose of this report is to document the State Water Board's analysis of the need for, and effects of, potential changes to the 2006 Bay-Delta Plan to establish new LSJR flow and SDWQ objectives and a program of implementation for those objectives. In addition to other legal requirements, the State Water Board must comply with the requirements of the California Environmental Quality Act (CEQA)[3] when adopting water quality control plans (WQCP). CEQA

[1] The LSJR is that portion of the San Joaquin River between its confluence with the Merced River and downstream to Vernalis, and its three eastside tributaries include the Stanislaus, Tuolumne, and Merced Rivers.

[2] In this document, the terms "three eastside tributaries", "eastside tributaries" and "major SJR tributaries" all refer to the Merced, Tuolumne, and Stanislaus Rivers.

[3] CEQA's basic purposes are to: 1) inform the decision makers and public about the potential significant environmental effects of a proposed project, 2) identify ways that environmental damage may be mitigated, 3) prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternative or mitigation measures when feasible, and 4) disclose to the public why an agency approved a project if significant effects are involved. (Cal. Code Regs., tit. 14, § 15002, subd. (a).) To fulfill these functions, a CEQA review

authorizes the Secretary of the Resources Agency to certify a regulatory program of a State agency as exempt from the requirements for preparing EIRs, negative declarations, and initial studies if certain conditions are met. (Pub. Resources Code, § 21080.5.) The State Water Board's water quality control planning program is a certified regulatory program and thus, a SED may be prepared in lieu of an EIR. (*Ibid*.; Cal. Code Regs., tit. 14, § 15251, subd. (g).) This SED fulfills the requirements of CEQA, and the State Water Board's regulations to analyze the environmental effects of the proposed regulatory activity and other factors (e.g., Pub. Resources Code, § 21159 and Porter-Cologne Water Quality Control Act [Porter-Cologne Act], Wat. Code, § 13000 et seq., and the federal Clean Water Act [CWA] [33 U.SC., §1251 et seq.], as described in Section 1.5, *Regulatory Requirements*). This SED and other information will inform the State Water Board's consideration of the 2006 Bay-Delta Plan amendments described above.[4] This update of the 2006 Bay-Delta Plan, which describes the actions needed to protect the Bay-Delta ecosystem, does not affect the water rights of anyone either within or outside of the Delta. Any changes to water rights that may be needed to implement the plan will be considered in future proceedings.

This chapter presents a description of the plan area; a description of the institutional setting and legal authorities; background of State Water Board actions related to the plan amendment(s); a description of the scope, planning, areas of known controversy, scientific review, relevant legal requirements, and the scope and content of this report; and key principals used to prepare this SED. The purpose and goals of the plan amendments are discussed in detail in Chapter 3, *Alternatives Description*.

1.2 Plan Area

The plan amendments involve changes in flow requirements in the SJR Basin and changes in water quality objectives for the southern Delta (Figure 1-1). These plan amendments could directly affect portions of the SJR Basin and Delta that drain into, divert water from, or otherwise obtain beneficial use (e.g., surface water supplies) from the following water bodies.

- Stanislaus River from and including New Melones Reservoir to the confluence of the LSJR.
- Tuolumne River from and including New Don Pedro Reservoir to the confluence of the LSJR.
- Merced River from and including Lake McClure to the confluence with the LSJR.
- LSJR between the confluence of the Merced River to Vernalis.
- Southern Delta, including the SJR from Vernalis to Brandt Bridge; Middle River from Old River to Victoria Canal; and Old River/Grant Line Canal from the Head of Old River to West Canal.

These portions of the SJR Basin and Delta are referred to as the "plan area" throughout this SED (Figure 1-2). Chapter 2, *Water Resources*, provides a general description of the physical environmental conditions in the plan area and its vicinity. Evaluation of potential impacts of the plan amendments on various environmental resources may require consideration of areas outside of the defined plan area. The SED resource chapters describe such areas as appropriate.

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need not be exhaustive, and CEQA documents need not be perfect. The CEQA documents should be adequate, complete, and represent a good faith effort at full disclosure. (Cal. Code Regs., tit.14, § 15151.)

[4] These plan amendments are the "project" as defined in State CEQA Guidelines, Section 15378.

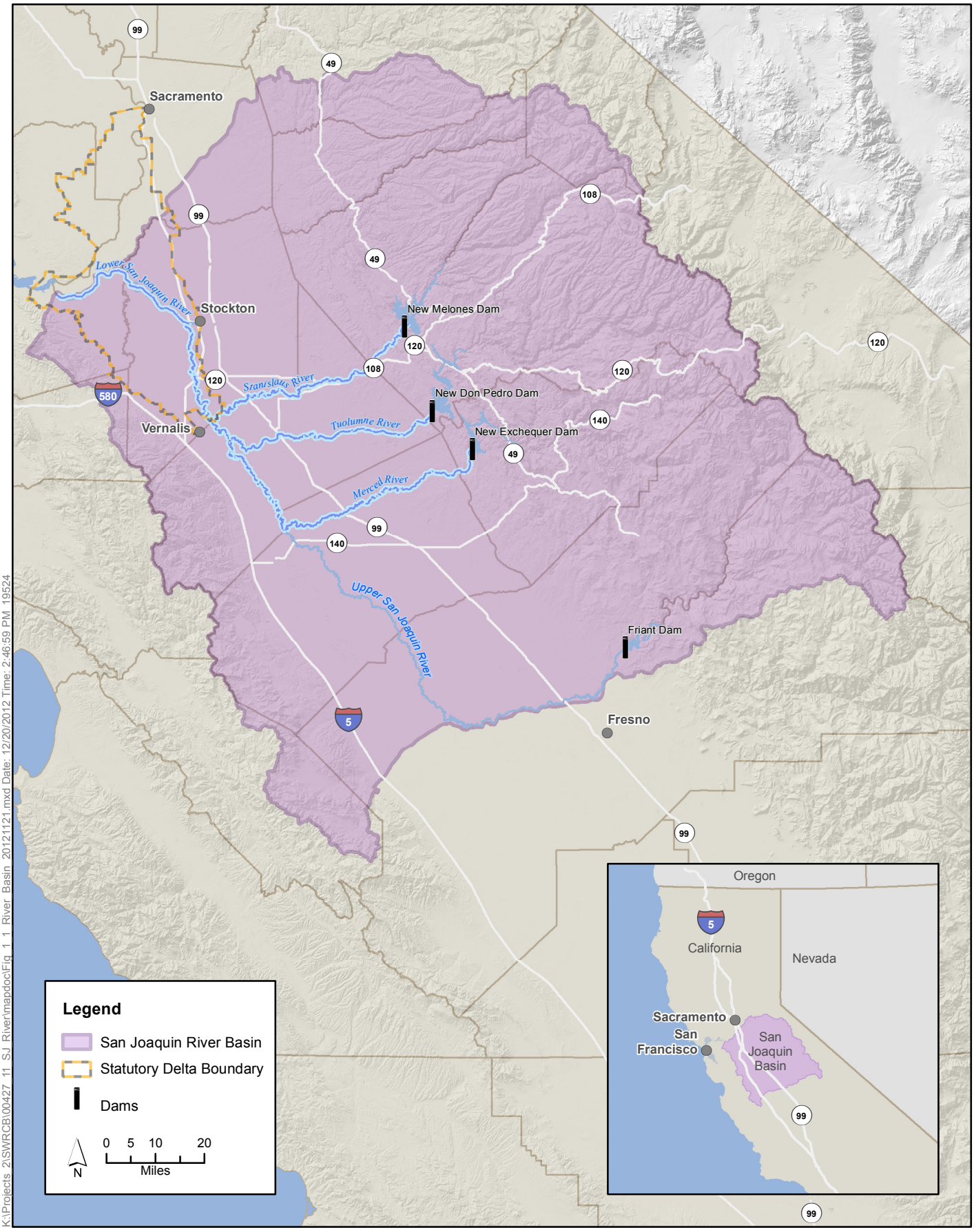

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Figure 1-1
San Joaquin River Basin

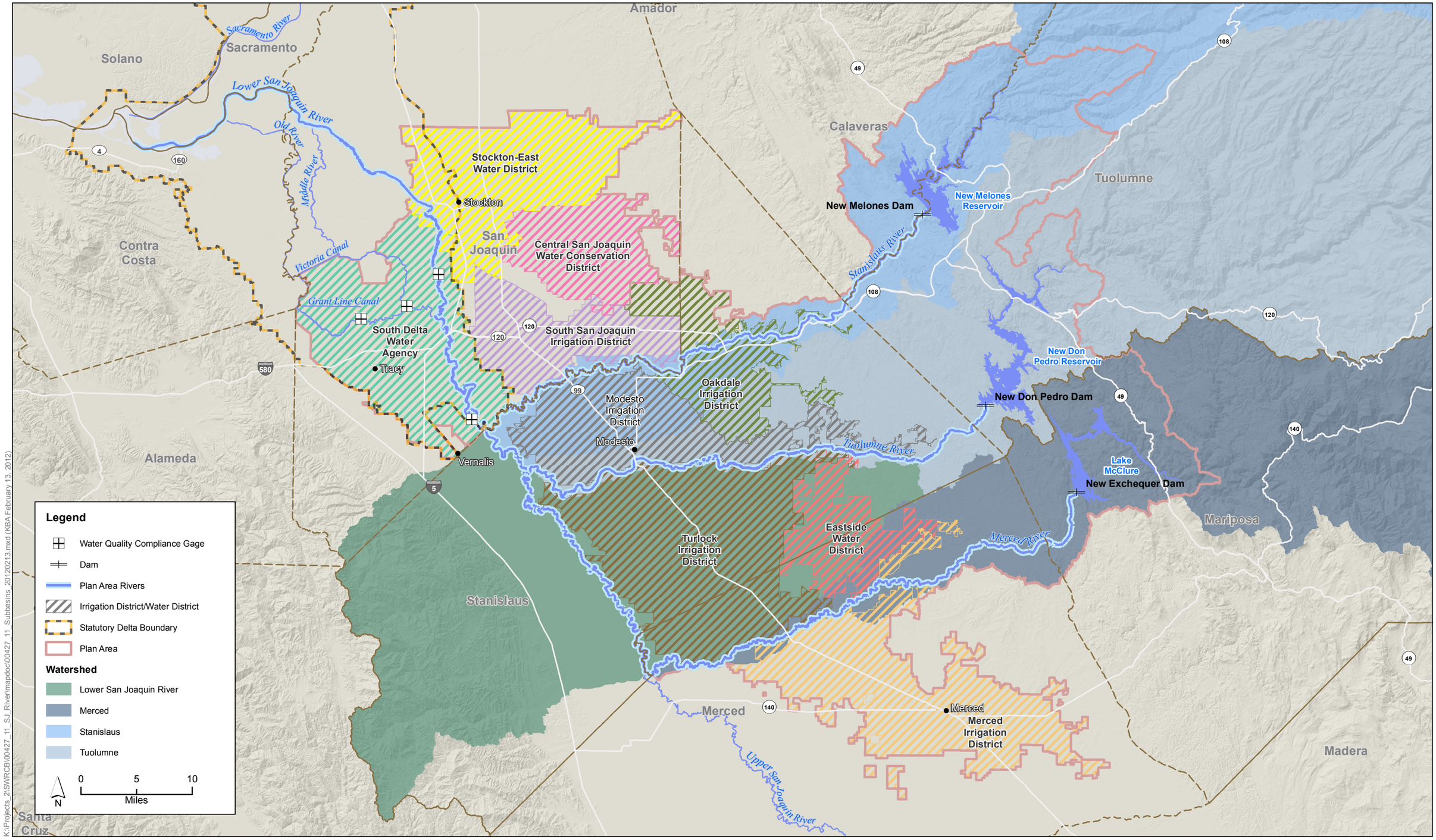

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Figure 1-2
Plan Area

1.3 State Water Board Authorities

The State Water Board was formed in 1967 when the State Water Rights Board and the State Water Quality Control Board were merged by the Legislature, based on the realization that decisions affecting water quality and water rights are inseparable. The State Water Board is composed of five full-time appointees of the governor. Under its dual legal authority, the State Water Board allocates rights to the use of surface water and, together with the nine regional water quality control boards (Regional Water Boards), takes actions to ensure the highest reasonable quality for waters of the state through administration of the Porter-Cologne Act and portions of the CWA.

1.3.1 Porter-Cologne Act

The Porter-Cologne Act is the basic water quality control law for California. The Porter-Cologne Act is administered by the State Water Board and the Regional Water Boards, which have the primary responsibility for coordination and control of water quality in the state. The Regional Water Boards also implement portions of the CWA.

The Regional Water Boards are authorized to adopt WQCPs to protect water quality in the state. (Wat. Code, §§ 13170, 13240 et seq.). The State Water Board has authority over waters for which water quality standards are required by the CWA. (Wat. Code, § 13170.) A WQCP adopted by the State Water Board supersedes a Regional Water Board's WQCP for the same waters to the extent that there is any conflict (Wat. Code, § 13170).

A WQCP establishes the beneficial uses of a water body, specifies numeric or narrative water quality objectives to protect those beneficial uses, and includes a program of implementation for achieving the objectives. (Wat. Code, § 13050, subd. (j).) Water quality objectives usually are implemented through water quality actions, such as waste discharge requirements, or as conditions of water right permits or licenses.

The portions of the WQCPs that fall under the jurisdiction of the federal CWA require approval by the U.S. Environmental Protection Agency (USEPA). When approved by the USEPA, the water quality objectives and beneficial use designations become water quality standards under the federal CWA.

WQCPs are periodically reviewed and amended to protect water quality. After a WQCP is adopted, the Water Code and the CWA require, respectively, a periodic and a triennial review of water quality objectives or standards under Water Code Sections 13170 and 13240 and under Section 303(c)(1) of the CWA (33 U.S.C., § 1313(c)(1)). As explained herein, compliance with CEQA and the preparation of environmental documentation is required as part of the WQCP amendment process.

1.3.2 Water Rights

California has established a water right system that allows for the orderly allocation and use of its water supply. The State Water Board is charged with administering the state's water right system. The State Water Board's water right authority has been the principal authority used to implement the 2006 Bay-Delta Plan in the past because the flow and salinity objectives have been implemented through flow measures and water project operations that have required changes in water rights. The State Water Board has authority to amend an existing water right by invoking: (1) its reserved jurisdiction over certain permits under Water Code Section 1394; (2) its continuing authority to

prevent the waste, unreasonable use, or unreasonable method of use of water under the California Constitution, Article X, Section 2; or (3) its continuing authority to protect public trust uses of water.

California law recognizes several types of rights to surface water, of which riparian and appropriative rights are the most common. A riparian right exists by reason of ownership of land abutting a stream or other body of water. The right allows a water user to divert from the natural flow of a stream for use on land within the watershed of the source. Seasonal storage of water is not allowed under a riparian right. With certain limited exceptions, riparian water users have first priority to the use of the natural flow in a river. Water remaining after riparian users have taken their share is available to appropriators. With certain limited exceptions, a record of diversion and water use under a riparian claim, called a Statement of Water Diversion and Use, must be filed with the State Water Board. (Wat. Code, § 5100 et seq.)

Appropriative rights carry a priority relative to other appropriative rights. The water user who is first in time is entitled to the full quantity of water specified under the right before junior appropriators may exercise their rights. Appropriative water rights fall into two general categories: pre-1914 appropriative water rights and post-1914 appropriative water rights. No permit or license is necessary to divert water under claim of pre-1914 appropriative right; however, a Statement of Water Diversion and Use (a record of water use under claim of pre-1914 appropriative right) must be filed with the State Water Board. Since 1914, appropriative rights have been obtained by receiving a permit or license from the State Water Board or its predecessor agencies. All new appropriators must file an application with the State Water Board and obtain a permit before diverting water. In granting permits, the State Water Board determines whether the water will be put to beneficial use, how much water may be taken, when and where it can be taken, and whether it is necessary to impose conditions to protect the environment, the public trust, and prior rights. If the water is diverted and used in accordance with the terms of the permit, a license eventually will be issued confirming the extent of the appropriative right.

1.4 State Water Board Actions

The 2006 Bay-Delta Plan is a WQCP established and periodically reviewed and modified by the State Water Board in accordance with applicable law. The current 2006 Bay-Delta Plan was adopted by the State Water Board by Resolution No. 2006-0098 on December 13, 2006. The 2006 Bay-Delta Plan identified a number of emerging issues that required additional review and water quality control planning. Two of the emerging issues identified for further evaluation and prioritization were SJR flows and southern Delta salinity (State Water Board 2006), which are the focus of this SED. The State Water Board again identified these issues for further review in the *2009 Staff Report on the Periodic Review of the 2006 Bay-Delta Plan*, adopted by Resolution No. 2009-0065 on August 4, 2009. As discussed above, other portions of the 2006 Bay-Delta Plan will be reviewed and updated as part of Phase II of the 2006 Bay-Delta Plan review.

In July of 2008, the State Water Board adopted the *Strategic Workplan for Activities in the San Francisco Bay/Sacramento–San Joaquin Delta Estuary* and committed to begin the process to review and potentially amend the SJR flow and southern Delta salinity objectives and associated program of implementation included in the 2006 Bay-Delta Plan. The State Water Board began the amendment process in February of 2009 by issuing a notice of preparation (NOP) of environmental documentation and scheduling a scoping meeting in March of 2009 pursuant to the provisions of CEQA. In April of 2011, the State Water Board issued a revised NOP and notice of an additional

scoping meeting for June of 2011. The State Water Board also held several other public meetings and workshops to receive information and conduct discussions regarding issues related to the plan amendment(s). The State Water Board also provided several additional opportunities for public comment related to aspects of the State Water Board's review. A timeline of these activities is provided below in Section 1.5.2.

The following section describes the State Water Board's past actions and proposed plan amendments related to LSJR flows and southern Delta water quality related litigation associated with flows and water quality, and related planning efforts in the Bay-Delta.

1.4.1 Lower San Joaquin River Flows

Past Flows

Storage reservoirs were constructed in the SJR Basin beginning with Friant Dam (Millerton Lake) in the 1940s. Since that time, native LSJR fish populations, including Chinook salmon and Central Valley steelhead, have declined. The SJR flows at Vernalis and in the three eastside tributaries are generally much lower than the natural peaks in flow that would have occurred in spring and early summer because of reservoir storage and diversions. At the same time, the natural low flow periods of the late summer and early fall have been elevated at times due to agricultural return flows and power generation releases of previously stored water. The flow changes and physical habitat modification activities (e.g., gravel mining) have resulted in poor habitat conditions for native fishes.

The State Water Board first established the flow objectives for the SJR at Vernalis in the 1995 Bay-Delta Plan to protect fish and wildlife beneficial uses from the adverse effects of flow modifications. In the 1995 Bay-Delta Plan, the State Water Board developed SJR flow objectives primarily intended to protect fall-run Chinook salmon and provide incidental benefits to Central Valley steelhead from the three eastside tributaries. The State Water Board set different numeric objectives based on water year type for three time periods: February–June, excluding April 15–May 15 (spring flows); April 15–May 15 (pulse flows); and October (fall flows). The spring flows were intended to provide minimum net downstream freshwater flows in the SJR to address habitat concerns from reduced flows and water quality degradation. The pulse flows were developed to increase the success of Chinook salmon smolt outmigration from the SJR through the Bay-Delta. The fall flows were developed to provide attraction flows for adult salmon returning to the SJR watershed to spawn. The spring flow and pulse flow objectives include two levels for each time period. The trigger for the higher flow is linked to the February–June Delta outflow objectives (X2),[5] which are based on hydrologic conditions in the Sacramento River Basin and the SJR Basin.

During proceedings regarding implementation of the 1995 Bay-Delta Plan, the State Water Board tried an alternative approach to deciding the responsibilities of water right holders by providing them with an opportunity to reach settlement agreements with other water right holders and interested persons who proposed allocations that would responsibly meet the flow-dependent objectives in the 1995 Bay-Delta Plan. The result was the San Joaquin River Agreement (SJRA),

[5] X2 is the location of the 2 parts per thousand salinity contour (isohaline), one meter off the bottom of the estuary measured in kilometers upstream from the Golden Gate Bridge. The abundance of several estuarine species has been correlated with X2. In the 1995 Bay-Delta Plan, an electrical conductivity value of 2.64 millimhos/centimeter (mmhos/cm) is used to represent the X2 location. Note, in this SED, electrical conductivity is generally expressed in deciSiemens per meter (dS/m). The conversion is 1 mmhos/cm = 1 dS/cm.

which proposed an alternate method to meeting the SJR portions of the objectives in the 1995 Bay-Delta Plan. The signatory parties, including the California Resources Agency, the U.S. Department of the Interior (USDOI), San Joaquin River Group, Central Valley Project/State Water Project Export Interests, and two environmental groups, agreed that the San Joaquin River Group Authority (SJRGA) members would meet the experimental flows specified in the Vernalis Adaptive Management Plan (VAMP) in lieu of meeting the spring pulse flow objectives adopted in the 1995 Bay-Delta Plan. In Water Right Decision 1641 (D-1641), revised March 15, 2000, the State Water Board approved the conduct of VAMP for a period of 12 years in lieu of meeting the SJR pulse flow objectives and assigned responsibility to the U.S. Bureau of Reclamation (USBR) for meeting the SJR flow objectives. The State Water Board also approved petitions for water right changes and established the condition for the water rights of various SJRGA members to provide water for VAMP and the October pulse flow objective.

VAMP, which was initiated in 2000 and expired in 2011, was a large-scale, experimental management program that was designed to determine how juvenile fall-run Chinook salmon survival rates change in response to alterations in SJR flows and CVP and SWP exports with the installation of a barrier at the head of Old River (HORB). The VAMP experiment (implemented for a 31-day period during April and May) was designed to assess a combination of flows, varying between 3,200 cubic feet per second (cfs) and 7,000 cfs, and exports varying between 1,500 and 3,000 cfs. Information from the VAMP experiment was intended to inform potential changes to the SJR flow objectives.

In the 2006 Bay-Delta Plan, the flow objectives were not modified, but the program of implementation was changed to allow for the ongoing staged implementation of the pulse flow objectives through VAMP. In addition, as discussed above, SJR flows were identified as an emerging issue requiring additional review and water quality control planning to address ongoing population declines of salmonids, despite implementation of VAMP, which have been largely attributed to inadequate flow conditions. Along with these population declines, the expiration of the SJRA and VAMP also prompted review of the SJR flow objectives.

Other flow requirements for the SJR, including Endangered Species Act (ESA) biological opinion requirements and Federal Energy Regulatory Commission (FERC) licensing requirements are described in Chapter 2, *Water Resources*, and Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*.

Proposed Amendments

The existing LSJR flow objectives identified in the 2006 Bay-Delta Plan would be amended to protect the beneficial uses of fish and wildlife. The alternatives evaluated in this SED include a narrative objective to establish flow sufficient to support and maintain the natural production of fish populations in the plan area that mimic the natural hydrograph with respect to relative magnitude, duration, timing, and spatial extent of flows. As part of the program of implementation the narrative flow objectives are applied as percentages of unimpaired flow in order to achieve protection of beneficial uses. The alternatives include the following.

- LSJR Alternative 1, which is the No Project Alternative, would continue the flow requirements as described by the 2006 Bay-Delta Plan and implemented through D-1641.
- LSJR Alternative 2 would establish 20 percent unimpaired flow equally on the three eastside tributaries.

- LSJR Alternative 3 would establish 40 percent of the unimpaired flow equally on the three eastside tributaries.
- LSJR Alternative 4 would establish 60 percent unimpaired flow equally on the three eastside tributaries.

The program of implementation for all LSJR alternatives also includes: water rights actions; modification to the FERC hydropower licensing process; adaptive management of flows February–June; and, special studies, reporting, and monitoring. As noted at the beginning of this document, the State Water Board's Phase III would specifically identify the water rights that could be modified as a result of adopting and applying the program of implementation for the LSJR flow objectives analyzed in this SED as part of Phase I. Details of these four LSJR alternatives are provided in Chapter 3, *Alternatives Description*, and the language of the amended WQCP is included in Appendix K, *Revised Water Quality Control Plan.*

The Preferred LSJR Alternative was identified after evaluating analyses contained in this SED. Accordingly, the evaluation of the preferred alternative is included in Chapter 20, *Preferred LSJR Alternative and SDWQ Alternative*. Proposed amendments to the 2006 Bay-Delta Plan are identified in Appendix K. The Preferred LSJR Alternative falls within the range of alternatives analyzed in this SED.

1.4.2 Southern Delta Water Quality

Past Water Quality Objectives

Elevated salinity in the southern Delta is caused by various factors, including low flows; salts imported to the SJR Basin in irrigation water; municipal discharges; subsurface accretions from groundwater; tidal actions; diversions of water by the CVP, SWP, and local water users; channel capacity; and discharges from land-derived salts, primarily from agricultural drainage. Salinity in the southern Delta is also affected by evapoconcentration of salts due to local agricultural operations, and, to a lesser extent, by local municipal wastewater treatment plant discharges. Poor flow or circulation patterns in the southern Delta waterways also cause localized increases in salinity concentrations.

The State Water Board established the current southern Delta salinity/electrical conductivity (EC)[6] objectives for the protection of agricultural beneficial uses in the 1978 Delta Plan. The 1978 Delta Plan includes salinity objectives for the protection of agriculture in the southern Delta at four compliance locations including: the SJR at Vernalis, the SJR at Brandt Bridge, Old River near Middle River, and Old River at Tracy Road Bridge. The approach used in developing the objectives involved an initial determination of the water quality needs of significant crops grown in the area, the predominant soil type, and local irrigation practices. In addition, the extent to which these water quality needs would be satisfied under "without project" (without the CVP and SWP) conditions was also considered. The State Water Board based the southern Delta EC objectives on the calculated maximum salinity of applied water (assuming no precipitation) that sustains 100 percent yields of

[6] EC is electrical conductivity, which is generally expressed in deciSiemens per meter (dS/m) in this chapter and document. Measuring EC assesses salinity, which is the concentration of dissolved salts (often expressed in parts per thousand or parts per million). Because salinity refers to salt concentration in the water, whereas EC values are the result of one measurement technique to assess salinity, both "EC" and the more general term "salinity" are used in this chapter.

two important salt-sensitive crops grown in the southern Delta (beans and alfalfa) in conditions typical of the southern Delta (surface irrigation of mineral soils) per the *University of California Guidelines and Irrigation and Drainage Paper 29: Water Quality for Agriculture of the Food and Agriculture Organization of the United Nations* (State Water Board 1978, page VI-16 – VI-19). The State Water Board set an objective of 0.7 dS/m during the summer irrigation season (April 1–August 31) based on the salt sensitivity and growing season of beans and an objective of 1.0 dS/m during the winter irrigation season (September 1–March 31) based on the growing season and salt sensitivity of alfalfa during the seedling stage. In the 1978 Delta Plan, the State Water Board found that the most practical solution for long-term protection of southern Delta agriculture was construction of physical facilities to provide adequate circulation and substitute supplies.

The State Water Board delayed implementation of the southern Delta salinity objectives pending negotiations by the Department of Water Resources (DWR), USBR, and the South Delta Water Agency (SDWA) concerning construction of physical facilities to protect agriculture in the southern Delta (permanent barriers or other devices). Because the negotiations were never completed, the 1991 Bay-Delta Plan provided for a staged implementation of the objectives. The 1991 Bay-Delta Plan called for implementation of the objectives at Vernalis and Brandt Bridge by 1994 and implementation of the objectives at the two Old River sites by 1996 unless a three-party agreement was reached between DWR, USBR, and SDWA. In the 1995 Bay-Delta Plan, the State Water Board further delayed implementation of the EC objectives for the two Old River sites until December 31, 1997.

In D-1641, the State Water Board authorized a staged implementation of the southern Delta EC objectives. Pursuant to D-1641, USBR was required to meet the Vernalis EC objectives using any measures available. DWR and USBR also were required to meet an EC objective of 1.0 dS/m at Brandt Bridge on the SJR, Old River near Middle River, and Old River at Tracy Road Bridge (the interior southern Delta stations) March–September until April 1, 2005. As of April 1, 2005, D-1641 required that DWR and USBR, through their water right permits and license, meet an EC objective of 0.7 dS/m April–August at the interior southern Delta stations unless permanent barriers were constructed or equivalent measures were implemented to protect southern Delta agriculture along with an operations plan. As discussed below in Section 1.4.3, *Related Litigation*, the appellate court reviewing D-1641 struck down the provision allowing 1.0 EC to be met if such measures were taken. Accordingly, the objectives in the 2006 Bay-Delta Plan are in effect.

Since 1991, DWR has installed temporary rock barriers in the southern Delta at three locations to improve water levels, circulation patterns, and water quality in the southern Delta for local agricultural diversion.[7] DWR and USBR were planning to construct permanent physical facilities in the form of permanent operable gates (known as the South Delta Improvements Program) that would have provided better compliance with the objectives. However, the facilities have not been constructed to date, and their construction is unlikely due to endangered species concerns.

In 2006 the State Water Board issued a cease and desist order (CDO) against USBR and DWR for threatened violation of the interior southern Delta salinity objectives (WR 2006-0006). In 2010, the State Water Board issued Order WR 2010-0002 modifying Order WR 2006-0006. The modified order includes conditions to be met to protect agricultural beneficial uses in the southern Delta. Pursuant to Condition 5 of Order WR 2010-0002, DWR and USBR are required to continue

[7] DWR is the lead agency pursuant to CEQA and has prepared several environmental documents for construction and operations of the barriers.

implementing temporary barriers in the southern Delta and are required to pursue and implement feasible improvements to the temporary barriers. Pursuant to Condition 7 of Order WR 2010-0002, they are also required to study the feasibility of controlling salinity by implementing measures other than the temporary barriers project.

Since the issuance of the CDO, there have been many instances of exceedance of the EC objective in the southern Delta, in particular at the Old River near Tracy Road Bridge, Station P-12. Typically this exceedance occurs due to dry hydrologic conditions in the Sacramento River and SJR Basins and degradation occurring downstream of Vernalis.

As discussed above, southern Delta salinity was identified as an emerging issue requiring additional review and water quality control planning for objectives protective of agricultural beneficial uses and a program of implementation. The State Water Board again identified these issues for further review in the *2009 Staff Report on the Periodic Review of the 2006 Bay-Delta Plan*.

Proposed Amendments

The existing SDWQ objectives for salinity identified in the 2006 Bay-Delta Plan would be amended to protect agricultural beneficial uses in the southern Delta. The alternatives evaluated in this SED include the following.

- SDWQ Alternative 1, which is the No Project Alternative, would continue the existing salinity objectives as 1.0 dS/m September through March and 0.7 dS/m April through August in the southern Delta; continued conditioning of the United States Bureau of Reclamation (USBR) water rights at New Melones Dam to meet the water quality objective for salinity at Vernalis (0.7 dS/m); and, continued use of the temporary agricultural barriers in the southern Delta.
- SDWQ Alternative 2 would establish an annual 1.0 dS/m salinity objective for the southern Delta and include continued conditioning of USBR water rights to meet its current salinity D-1641 compliance requirement at Vernalis; continued use of the temporary agricultural barriers; and various study, planning and monitoring requirements.
- SDWQ Alternative 3 would establish an annual 1.4 dS/m salinity objective for the southern Delta and include continued conditioning of USBR water rights to meet its current salinity D-1641 compliance requirement at Vernalis; continued use of the temporary agricultural barriers; and various study, planning and monitoring requirements.

Details of these three LSJR alternatives are provided in Chapter 3, *Alternatives Description*, and the language of the amended WQCP is included in Appendix K, *Revised Water Quality Control Plan*.

The Preferred SDWQ Alternative was identified after evaluating analyses contained in this SED. Accordingly, the evaluation of the preferred alternative is included in Chapter 20, *Preferred Alternatives*. The Preferred SDWQ Alternative is analyzed in this SED (SDWQ Alternative 2).

1.4.3 Related Litigation

This section discusses litigation related to the establishment and implementation of water quality objectives in the 2006 Bay-Delta Plan and D-1641.

In 2006, the Third District Court of Appeal in *State Water Resources Control Board Cases* (2006) 136 Cal. App.4th 674 issued a decision addressing challenges to the State Water Board's actions in D-1641. In large part, the court upheld D-1641 but concluded that when a WQCP calls for an

objective to be achieved by allocating responsibility to meet that objective in a water right proceeding, the water right decision must fully implement that objective. Accordingly, the court determined that the State Water Board improperly delayed implementation of the Vernalis pulse flow objective in the 1995 Bay-Delta Plan by instead allowing the immediate implementation of an alternate experimental flow regime under VAMP, thus allowing the possibility of a lesser flow than the Vernalis pulse flow objective. The court also found that the State Water Board failed to adequately implement the southern Delta salinity objectives at the three interior Delta locations by delaying implementation of the 0.7 dS/m objective at those locations. The court required a writ of mandate be issued commanding the State Water Board to commence proceedings to either assign responsibility for meeting the Vernalis pulse flow objective and the southern Delta salinity objectives in the 1995 Bay-Delta Plan or to modify those objectives. The State Water Board complied with the writ by amending the 2006 Bay-Delta Plan to allow staged implementation of the Vernalis pulse flow objective (through the target flows in VAMP) and by commencing the current project to evaluate the southern Delta salinity objectives and program of implementation.

Implementation of the southern Delta salinity objectives is at issue in *City of Tracy v. California State Water Resources Control Board* (Sacramento Superior Court Case No. 34-2009-80000392). In this case, the City of Tracy (Tracy) challenged the State Water Board's 2009 decision to remand the National Pollutant Discharge Elimination System permit issued by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) for Tracy's wastewater treatment plant. The State Water Board had partially remanded the permit to the Central Valley Water Board to include more rigorous requirements (including final water quality-based effluent limitations) to implement the southern Delta salinity objectives. In part, Tracy challenged the applicability of the salinity objectives in the underlying Bay-Delta Plan, arguing that they were never properly adopted and that the 2006 amendments did not provide an adequate program of implementation for municipal dischargers. The Central Valley Clean Water Association intervened in the litigation, representing all municipal dischargers in the southern Delta. In 2011, the trial court ruled against the State Water Board and issued a writ ordering the State Water Board to modify the portions of the Tracy order relating to the salinity objectives in the Bay-Delta Plan and requiring the Board to perform several analyses, including consideration of Water Code Section 13241 factors, before enforcing Bay-Delta salinity limits on Delta municipal dischargers. The State Water Board did not appeal.

1.4.4 Related Planning Processes

The following is a summary of significant Delta planning and research activities. The summary is not intended to be comprehensive. However, it does provide an indication of the breadth of the State and federal involvement in the Delta.

Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS)

In 2006, the State Water Board and Central Valley Water Board initiated a stakeholder effort (Central Valley Salinity Alternatives for Long-Term Sustainability, or CV-SALTS) to address salinity problems in the Central Valley and to adopt long-term solutions that will lead to enhanced water quality and economic sustainability.

In July 2008, the Central Valley Salinity Coalition (CVSC) was formed. CVSC represents stakeholder groups working with the Central Valley Water Board in the CV-SALTS effort. Its purpose is to organize, facilitate, and fund efforts needed to fulfill the goals of CV-SALTS. CVSC coordinates the

meetings of the CV-SALTS committees, maintains an independent website, and manages the CV-SALTS-related projects.

Since its inception, CV-SALTS has produced an educational film on the economic impacts of salinity on the Central Valley and the state, developed a strategy and workplan, hired a program manager and policy and technical consultants, conducted a salt and nutrient assessment pilot study, and developed the basis for a GIS framework to manage project data. Currently, stakeholder participants are exploring potential beneficial use and water quality objective changes and implementation alternatives to pursue. Stakeholders have identified and are providing supporting for three projects that could act as examples and provide templates for some of the changes being considered. Near-term projects include developing the first phase of a conceptual model for salt and nitrate conditions in the Central Valley and a comprehensive and robust GIS framework to support the salt management planning effort. The goal is to have a salt-management plan in compliance with the state's recycled water policy by 2014.

Upstream San Joaquin River Salinity Objectives and Total Maximum Daily Load

In D-1641, the State Water Board directed the Central Valley Water Board to adopt water quality objectives for salinity in the LSJR, upstream of Vernalis. Until 2010, Central Valley Regional Water Board staff worked on that effort, which was intended to expand upon the work previously completed in the Vernalis total maximum daily load (TMDL). In May 2010, responsibility for this project was given to CV-SALTS, and the CV-SALTS Lower San Joaquin River Committee was established. The Committee has developed a work plan to evaluate and propose beneficial uses of the river, water quality objectives to protect those beneficial uses and, an implementation plan to achieve those objectives. The Committee has also hired a committee manager charged with oversight of the Committee activities and workplan implementation. The workplan schedule calls for submittal of a basin plan amendment for consideration by the Central Valley Water Board by July 2014.

Central Valley Drinking Water Policy

The 2000 CALFED record of decision (ROD) identified the need for a drinking water policy (Policy) for the Delta and upstream tributaries. In the 2002 Implementation Memorandum of Understanding (MOU) for the CALFED Drinking Water Quality Program, the Central Valley Water Board, in consultation with the Department of Public Health (DPH), the State Water Board, and USEPA, was given primary responsibility for developing the Policy. The Central Valley Drinking Water Policy Workgroup (Workgroup) was formed, comprised of federal and State agencies, drinking water agencies, and wastewater, municipal storm water and agricultural interests. Workgroup members have provided funding as well as received grant funding to conduct technical studies and analytical modeling to support Policy development.

In July 2010, the Central Valley Water Board adopted Resolution No. R5-2010-0079, titled *Establishment of a Drinking Water Policy for the Sacramento–San Joaquin Delta and Upstream Tributaries* (2010 Resolution). The 2010 Resolution documented progress to date, provided direction for future actions, and set deadlines for interim deliverables associated with Policy development by July 2013.

Since the 2010 Resolution, staff has coordinated with the Workgroup to complete the grant-funded technical studies and analytical modeling. Staff is now coordinating the completion of a workgroup

synthesis report of work done since the initiation of the Workgroup to support Policy development. Staff has worked closely with the Workgroup to develop the draft Policy Outline and Workplan/Funding Proposal as required by the 2010 Resolution.

Sacramento-San Joaquin Delta Reform Act and Delta Stewardship Council's Delta Plan

In November 2009, the State of California enacted comprehensive legislation to address the range of challenges facing the Delta, including those involving water supply reliability and ecosystem health. The Delta legislation includes the Sacramento–San Joaquin Delta Reform Act of 2009 (California Water Code 35), which provides for the establishment of an independent state agency, the Delta Stewardship Council (Council), to achieve the coequal goals of ecosystem restoration and a reliable water supply. The Delta Reform Act also imposes requirements on the preparation of the Bay Delta Conservation Plan (BDCP), and allows the BDCP to be incorporated into the Delta Plan if the BDCP is approved by DFG as a natural community conservation plan (NCCP) and if the BDCP is approved as a habitat conservation plan (HCP) pursuant to the ESA.

The Council, which became operational on February 3, 2010, was charged with the development and implementation of a legally enforceable, long-term comprehensive management plan for the Sacramento–San Joaquin Delta. The Council is vested with the authority to review actions of State and local agencies and advise on their consistency with the Delta Plan. The Council released an additional draft program EIR (PEIR) volume (covering final draft Delta Plan) for public review and comment in November 2012. The final PEIR (including response to comments on the draft PEIR and on the additional draft PEIR volume) will be considered by the Council for certification; and the final draft Delta Plan will be considered for adoption and use in the final regulatory approval process (including submittal of the final Delta Plan policies to the Office of Administrative Law) in Spring 2013. The Delta Plan policies will become law following the completion of regulatory adoption process by the Office of Administrative Law in Summer 2013.

The draft Delta Plan recommends that the State Water Board develop, implement, and enforce new updated flow objectives for the Delta and the major tributary streams in the Delta watershed. The final draft of the Delta Plan recommends the State Water Board develop flow criteria for high-priority tributaries in the Delta watershed that are necessary to achieve the coequal goals. The State Water Board identified the Merced, Tuolumne, and Stanislaus Rivers as a few of the high priority tributaries.

Bay-Delta Conservation Plan

The BDCP is being developed to provide a regulatory vehicle for project proponents in the Delta to agree to implement a suite of habitat restoration measures, other stressor reduction activities, and water operations criteria in return for regulatory agency approval of the necessary long-term permits for the various projects and water operations (covered activities) to proceed.

The BDCP is being prepared by a group of local water agencies, environmental and conservation organizations, state and federal agencies, and other interest groups, in compliance with ESA and the California Natural Communities Conservation Planning Act (NCCPA). When complete, the BDCP will provide the basis for the issuance of endangered species permits for the operation of the state and federal water projects. The plan would be implemented over the next 50 years.

Grasslands Bypass Project

The Grassland Bypass Project (Grassland Project) is operated by USBR and the San Luis and Delta-Mendota Water Authority (Authority). The Use Agreement between USBR and the Authority specifies the conditions for use of the San Luis Drain for the Grassland Project and further specifies the maximum monthly and annual loads of salt that can be discharged. The Grassland Project prevents discharge of subsurface agricultural drainage water into wildlife refuges and wetlands in central California. The drainage water is conveyed through a segment of the San Luis Drain to Mud Slough, a tributary of the SJR. The Grassland Project improves water quality in the wildlife refuges and wetlands, sustains the productivity of 97,000 acres of farmland, and fosters cooperation between area farmers and regulatory agencies in drainage management reduction of selenium and salt loading. Data from the Grassland Project's monitoring program are collected and reviewed by staff from the U.S. Fish and Wildlife Service (USFWS), USEPA, Central Valley Water Board, and California Department of Fish and Game (DFG). The data are published by the San Francisco Estuary Institute.

U.S. Fish and Wildlife Service Anadromous Fish Restoration Program (AFRP)

Section 3406(b)(1) of the Central Valley Project Improvement Act (CVPIA) directs the Secretary of the Interior to develop and implement a program that makes all reasonable efforts to at least double natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis. The major resulting program is known as the Anadromous Fish Restoration Program (AFRP). Since 1995, the AFRP has helped implement over 195 projects to restore natural production of anadromous fish.

The Final Restoration Plan, adopted on January 9, 2001, is a programmatic-level description of the AFRP, and is used to guide AFRP's long-term development. The Restoration Plan presents the goal, objectives, and strategies of the AFRP; describes how the AFRP identified and prioritized reasonable actions and evaluations; lists those actions and evaluations; and notes those actions and evaluations that are already underway or that may be implemented in the near future.

The AFRP uses all the authority and resources provided by the CVPIA to restore anadromous fish and relies heavily on local involvement and partnerships with property owners, watershed workgroups, public and private organizations, county and local governments, and State and federal agencies. The AFRP coordinates restoration efforts with those by other groups, such as the DFG.

To date, DFG has prepared environmental assessments (EA) for the purpose of evaluating alternatives associated with improvement projects under the authority of the CVPIA 's AFRP and concludes a Finding of No Significant Impact for projects in the lower Calaveras, Merced, lower Mokelumne, Stanislaus, and Tuolumne Rivers consistent with recommendations in the Final Restoration Plan of the AFRP.

Department of Fish Game Ecosystem Restoration Program (ERP)

As part of the CALFED ROD, CALFED program implementation was broken into two stages, Stage 1 (2000–2007) and Stage 2 (2008–2030), to allow reevaluation of its preferred (through-Delta) conveyance alternative after Stage 1.

The draft ERP Conservation Strategy was released by DFG in 2011 (DFG 2011) to update the CALFED ERP plans from 2000. DFG collaborates with its federal fish agency partners, USFWS and

National Marine Fisheries Service (NMFS), to implement the ERP, including providing grants for Delta and Suisun Marsh restoration research and implementation.

DFG's Ecosystem Restoration Program Conservation Strategy for Restoration of the Sacramento–San Joaquin Delta Ecological Management Zone and the Sacramento and San Joaquin Valley Regions describes Stage 2 restoration of the Sacramento–San Joaquin Delta Ecological Management Zone (EMZ) and the Sacramento Valley and San Joaquin Valley Regions (CALFED 2000). It responds to analysis of Stage 1 research, restoration, and monitoring activities that determined the CALFED through-Delta conveyance alternative has not achieved sufficient progress in sustaining viable populations of endangered and threatened aquatic species.

San Joaquin River Restoration Program (SJRRP)

The San Joaquin River Restoration Program (SJRRP) is a comprehensive long-term effort to restore water flows to the San Joaquin River from Friant Dam to the confluence of the Merced River, restoring a self-sustaining Chinook salmon population in the river while reducing or avoiding adverse water supply impacts from restoration flows. USFWS is the lead federal agency on the restoration goal and fish reintroduction. The Sacramento Fish and Wildlife Office is the lead of the compliance, permitting and terrestrial restoration.

The SJRRP is a direct result of a settlement reached in September 2006 on an 18-year lawsuit to provide sufficient fish habitat in the SJR below Friant Dam by the USDOI, the Natural Resources Defense Council (NRDC), and the Friant Water Users Authority (FWUA). The settlement received federal court approval in October 2006. Federal legislation was passed in March 2009 authorizing federal agencies to implement the settlement. The settlement established two primary goals: (1) A restoration goal to restore and maintain fish populations in "good condition" in the main stem of the SJR below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish; and (2) a water management goal to reduce or avoid adverse water supply impacts on all of the Friant Division long-term contractors that may result from the interim flows and restoration flows provided for in the settlement.

Restoring continuous flows to the approximately 60 miles of dry river are being established in a phased manner. Planning, design work, and environmental reviews began upon reaching an agreement. Interim flows for experimental purposes began in the fall of 2009, with gradual increased flows over the past several years. Salmon will be reintroduced no later than December 31, 2012 in the upper reaches, and full restoration flows will begin no later than January 2014. The settlement will continue to be in effect until 2026, with the U.S. District Court retaining jurisdiction to resolve disputes and enforce the settlement. After 2026, the court, in conjunction with the State Water Resources Control Board, would consider any requests by the parties for changes to the restoration program.

The geographic area for the SJRRP includes California's Central Valley from the Delta to the base of the Tehachapi Mountains south of Bakersfield. The river restoration area is 153 miles long and reaches from Friant Dam to where it joins the Merced River. The SJRRP will also evaluate the Eastside and Mariposa bypasses for flows and fish passage.

The SJRRP released a draft program EIS/EIR (PEIS/PEIR) in April 2011. This document evaluates the potential environmental impacts of proposed alternatives that were developed to achieve the restoration and water management goals of the settlement. USBR and the DWR released a final PEIS/PEIR in July 2012. The joint document describes the direct, indirect and cumulative impacts of

implementing the settlement in *NRDC, et al., v. Rodgers, et al.,* that resolved more than 18 years of litigation related to USBR's operation of Friant Dam and established the SJRRP. The final EIS/EIR identifies Alternative C1 from the Draft PEIS/PEIR as the preferred alternative. Alternative C1 includes the use of the river channel and bypass system to convey restoration flows and allows for recapture of these flows in the Delta at existing facilities upstream of the Delta and at new facilities that may be constructed in the future. The SJRRP is being implemented by USBR, DWR, USFWS, NMFS, and DFG.

Temperance Flat Reservoir (Upper San Joaquin River Basin Storage Investigation Plan)

The Upper San Joaquin River Basin Storage Investigation (USJRBSI) is a joint feasibility study by USDOI, USBR, and DWR. The USJRBSI is one of five surface water storage studies recommended in the CALFED Bay-Delta Program (CALFED) ROD of August 2000. The purpose of the USJRBSI is to determine opportunities to develop water supplies to improve water supply reliability and flexibility of the water management system for agricultural, urban, and environmental uses, and enhance SJR water temperature and flow conditions to support anadromous fish restoration efforts. The ROD indicated that the Investigation should consider enlarging Friant Dam or developing an equivalent storage program to meet Investigation objectives.

San Joaquin County Multi-Species Habitat Conservation and Open Space Plan

The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (San Joaquin County HCP) was permitted in 2000 and administered by the San Joaquin Council of Governments. This 50-year plan addresses 97 special-status plant, fish and wildlife species in 52 vegetative communities scattered throughout almost all of San Joaquin County (over 900,000 acres), which includes a substantial fraction of the Delta. The plan participants are San Joaquin County and all seven cities in the county: Stockton, Lodi, Manteca, Tracy, Ripon, Escalon, and Lathrop. Activities covered under the plan include urban development, mining, expansion of existing urban boundaries, nonagricultural activities occurring outside of urban boundaries, levee maintenance undertaken by the San Joaquin Area Flood Control Agency, transportation projects, school expansions, nonfederal flood control projects, new parks and trails, maintenance of existing facilities for nonfederal irrigation district projects, utility installation, maintenance activities, managing preserves, and similar public agency projects.

U.S. Fish and Wildlife Service Delta Native Fishes Recovery Plan

This Delta Native Fishes Recovery Plan is intended to fulfill one of the primary purposes under Section 2 of the ESA of 1973—to provide a means for the conservation of ecosystems upon which endangered and threatened species depend. Accordingly, the purpose and scope of this recovery plan is to outline a strategy for the conservation and restoration of Delta native fishes through the development of recovery measures that address the unique biological capabilities and needs of the species and the specific threats to their existence. Therefore, the basic strategy for recovery is to manage the estuary in such a way that it is better habitat for aquatic life in general and for the fish species of concern in particular. Species addressed in this plan include: delta smelt, longfin smelt, and Sacramento splittail, and may also include efforts to reestablish the extirpated Sacramento perch.

Clean Water Act Section 401 Water Quality Certifications of Federal Energy Regulatory Commission (FERC) Hydroelectric Projects in Delta Watershed

Section 401 of the CWA states the following.

> Any applicant for a Federal license of permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate . . . that any discharge will comply with the applicable provisions of sections 1311, 1312, 1313, 1316, and 1317 of this title.

Renewal of the FERC license for a hydroelectric project is a federal action that requires water quality certification. (33 U.S.C., § 1341.) Before FERC can issue a new license for the project, a Section 401 water quality certification issued by the State Water Board or a waiver of Section 401 authority is required.

The State Water Board needs sufficient information to show that operation of the project under a new FERC license is consistent with both water quality objectives and the protection of the beneficial uses designated in the WQCP for the Sacramento and SJR Basins, and those designated in the 2006 Bay-Delta Plan.

The State Water Board is designated as the state water pollution control agency for all purposes stated in the CWA (33 U.S.C., § 1251, et seq.). (Wat. Code, § 13160.) The State Water Board is authorized to provide water quality certification under Section 401 of the CWA and to exercise any powers delegated to the state by the CWA. *(Ibid.)* Water Code Section 13383 authorizes the State Water Board to establish monitoring and reporting "for any person who discharges, or proposes to discharge, to navigable waters" pursuant to the authority defined under Section 13160.

Elements of the LSJR flow objectives may be implemented through conditions in water quality certifications. Delta watershed FERC projects currently undergoing water quality certification include: Merced River (New Exchequer), License expiration February 28, 2014, 103 megawatts; Tuolumne River (New Don Pedro), License expiration April 30, 2016, 168 megawatts.

Federal Energy Regulatory Commission Relicensing Proceedings on the Merced

Merced Irrigation District (Merced ID) owns and operates the Merced River Hydroelectric Project (Merced Project), FERC Project No. 2179, located on the Merced River that is comprised of McSwain Dam (River Mile [RM] 561), which impounds McSwain Reservoir, and New Exchequer Dam (RM 62), which impounds Lake McClure. Merced ID also owns and operates Crocker-Huffman Diversion Dam (RM 52) situated downstream of Pacific Gas and Electric Company's (PG&E) Merced Falls Dam (RM 55), a run-of-the-river hydroelectric power generation facility located immediately downstream of McSwain Dam. The Merced Project is currently undergoing relicensing with FERC. The current license expires on February 28, 2014.

On April 26, 2011, the State Water Board issued a Notice of Public Workshop to receive information relating to technical studies called for in Investigation Order WR 2011-003-EXEC (Order) issued to Merced Irrigation District (Merced ID) regarding its Merced River Hydroelectric Project. The State Water Board later issued a revised notice that rescheduled the workshop to August 3, 2011. Merced ID submitted study plans and data collection proposals that met the intent of the Order. Merced ID informed staff that it would no longer need the workshop, and due to the progress made to obtain the information requested in the Order, the State Water Board concurred.

Federal Energy Regulatory Commission Ruling on Tuolumne River (Project No 2299-065)

The State Water Board is currently following FERC's Integrated Licensing Process for the Tuolumne River. The current license expires on April 30, 2016. Modesto and Turlock Irrigation Districts plan on filing their application for a new license on or before April 30, 2014. In the Integrated Licensing Process, the State Water Board is currently engaged in the first season of studies and study review. New instream flow requirements as part of the new license will be based upon these studies.

The 1995 New Don Pedro Settlement Agreement contains instream flow requirements on the Tuolumne River for the anadromous fishery downstream from the project. NMFS, USFWS, and DFG, as well as several nongovernmental organizations, have sought to modify the requirements to provide flow and related conditions they believe are necessary to protect threatened Central Valley steelhead and Chinook salmon Essential Fish Habitat (EFH). The FERC ruling could result in increased flow releases from New Don Pedro Reservoir that would increase flows in the SJR downstream from its confluence with Tuolumne River, and thus could affect flow conditions within the SJR. In such an event, USBR would work with the fish agencies to evaluate resulting changes in flows to ensure that listed species are not adversely affected by the proposed action.

Department of Water Resources Temporary Barriers Project (TBP)

The South Delta Temporary Barriers Project (TBP) began as a test project in 1991. The project consists of four rock barriers across southern Delta channels. Three barriers are installed during the growing season to provide adequate water levels and water quality in the southern Delta for local agricultural diversions. The fourth barrier is to improve conditions for salmon migrating on the SJR. This barrier may be installed in the spring to prevent salmon migrating down the river from straying into the southern Delta where they can be entrained in the SWP and CVP pumping facilities. It is also installed in the fall, if needed, to improve flows for salmon migrating up the SJR to spawn.

The Interagency Ecological Program (IEP)

The Interagency Ecological Program (IEP) provides ecological information and scientific leadership for use in management of the San Francisco estuary. The IEP seeks to describe the status and trends of aquatic ecological factors of interest in the estuary; develop an understanding of environmental factors that influence observed aquatic ecological status and trends; use knowledge of the above information in a collaboration process to support natural resource planning, management, and regulatory activities in the estuary; continually reassess and enhance long-term monitoring and research activities that demonstrate scientific excellence; and provide scientific information about the estuary that is accurate, accessible, reliable, and timely.

The IEP Newsletter is a quarterly publication that provides IEP program and science highlights as well as in-depth articles on important scientific topics for resource managers, scientists, and the public. The spring issue of the IEP Newsletter provides an annual overview of important results from all IEP monitoring programs and associated studies.

To date, IEP is soliciting study concepts to advance the understanding of environmental drivers and ecological processes that control the population dynamics and resilience of native and introduced fish species of the San Francisco estuary.

Delta Smelt Refuge Population

DWR is working with USFWS and the University of California, Davis (UCD) through USFWS's Delta Smelt Captive Propagation Work Group to establish a permanent smelt refugia that would ensure the conservation of the genetic diversity of delta smelt. The refugia would provide the brood stock for a conservation hatchery if and when the State and federal fishery agencies decide it is needed to supplement the remaining wild population of delta smelt or to restock the Delta if the wild population is extirpated (as was done with the California condor). This facility is using wild-born smelt collected in 2006 as its initial founding stock.

The University of California, Davis Delta Smelt Culture Facility

UCD and the State, working with federal agencies, will upgrade and continue operation of a delta smelt culture laboratory located at the SWP Banks Pumping Plant in the Delta. UCD rears and provides over 20,000 juvenile and adult fish annually to researchers carrying out elements of the Pelagic Organism Decline Program investigation and evaluating ways to improve the performance of existing and new fish screening facilities. These research fish are the progeny of wild fish collected in the Delta in 2006, and with the curtailment of the collection of wild fish due to the declining population, they are now the only source of live research fish. Research is also conducted at the UCD fish culture facility on the physical and biological requirements of delta smelt.

1.5 Regulatory Requirements

This SED fulfills the State Water Board's regulations for the preparation of an SED and requirements of CEQA to analyze the environmental effects of a proposed regulatory activity and its alternatives. The State Water Board has a certified regulatory program, which is exempt from CEQA, but is subject to the substantive requirements of CEQA and California Code of Regulations, Title 23, Section 3777(a), which requires a written report that includes a description of the proposed activity, an analysis of reasonable alternatives, and an identification of mitigation measures to minimize any significant adverse environmental impacts. Furthermore, a certified regulatory program is subject to CEQA's policy of avoiding significant adverse effects on the environment, where feasible (see Section 1.10 of this SED). (Cal. Code Regs., tit. 14, § 15250.) Section 3777(a) also requires the State Water Board to complete an environmental checklist as part of its SED. This checklist is provided in Appendix B, *State Water Board's Environmental Checklist,* of this document. The State Water Board has adopted regulations governing exempt regulatory programs that establish procedural requirements and identify the information that must be contained in the State Water Board's SED. (Cal. Code Regs., tit. 23, §§ 3775–3781.)

In addition, the State Water Board must fulfill substantive obligations when adopting performance standards, as described in Public Resources Code Section 21159.[8] Section 21159 provides that an agency shall perform, at the time of the adoption of a rule or regulation requiring the installation of pollution control equipment, or a performance standard or treatment requirement, an environmental analysis of the reasonably foreseeable methods of compliance. The statute further requires that the environmental analysis, at a minimum, include all of the following.

[8]The SED regulations (Cal. Code Regs., tit. 23, § 3777) were written to comply with Public Resources Code Section 21159.

(1) An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.

(2) An analysis of reasonably foreseeable feasible mitigation measures to lessen the adverse environmental impacts.

(3) An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation that would have less significant impacts. (Pub. Resources Code, § 21159(a).)

Section 21159(c) requires that the environmental analysis take into account a reasonable range of the following.

(1) Environmental, economic, and technical factors.

(2) Population and geographic areas.

(3) Specific sites.

Public Resources Code Section 21159(d) specifically states that the public agency is not required to conduct a "project level analysis." Instead, any project level analysis will be performed by the agencies that are carrying out specific actions to implement the 2006 Bay-Delta Plan. Accordingly, the environmental impacts associated with project-level actions will necessarily depend upon the compliance strategy selected by a particular entity or required by the State Water Board in a subsequent proceeding.

This SED identifies the reasonably foreseeable environmental impacts of the reasonably foreseeable methods of compliance (Pub. Resources Code, § 21159(a)(1).) based on information developed before, during, and after the CEQA scoping process. This analysis is a program level (i.e., macroscopic) analysis. CEQA requires the State Water Board to conduct a program level analysis of environmental impacts. (Pub. Resources Code, § 21159(d).) Similarly, the CEQA SED does not engage in speculation or conjecture (Pub. Resources Code, § 21159(a).) When the CEQA analysis identifies a potentially significant environmental impact, the accompanying analysis identifies reasonably foreseeable feasible mitigation measures. (Pub. Resources Code, § 21159(a)(2).)

In addition to CEQA's requirements, the State Water Board's amendments to the 2006 Bay-Delta Plan must be prepared in accordance with applicable water quality planning provisions of the Porter-Cologne Act, Water Code Section 13000 et seq., and the CWA (33 U.SC., §1251 et seq.). Section 13241 of the Porter-Cologne Act identifies certain factors that must be evaluated when establishing water quality objectives. Some of these factors are: (1) past, present, and probably future beneficial uses of water; (2) environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto; (3) water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area; (4) economic considerations; (5) the need for developing housing within the region; and (6) the need to develop and use recycled water. This SED evaluates these factors with respect to the LSJR flow objectives and SDWQ objectives.

This SED also evaluates the LSJR flow objectives and SDWQ objectives in accordance with Section 13141 of the Porter-Cologne Act to the extent applicable. Prior to implementing any agricultural water quality control program, Section 13141 of the Porter-Cologne Act requires preparation of an estimate of the total cost of such a program, together with an identification of potential sources of financing.

1.5.1 Scope of Content and Analysis

This SED has been prepared in accordance with applicable state environmental regulations, policies, and laws to inform state decision makers regarding the potential environmental impacts of the LSJR flow objectives and SDWQ objectives. As an informational document, an SED does not recommend approval or denial of a project. This SED is being provided to the public for review, comment, and participation in the planning process. After public review and comment, a final SED will be prepared. The final SED will include responses to comments on the draft SED received from agencies, organizations, and individuals. It will be distributed to provide the basis for decision making by the CEQA lead agency, the State Water Board.

In developing this SED, the State Water Board considered the nature of the plan amendment(s), comments received in response to the NOP and during public consultation, other public comments and information, and the environmental issues identified in Appendix A of the State Water Board's CEQA regulations (Cal. Code Regs., tit. 23, §§ 3720-3781) and Appendix G of the State CEQA Guidelines. The State Water Board's determination of other impacts that are not potentially significant and that are not addressed in this SED are explained in Appendix B, *State Water Board's Environmental Checklist*. The State Water Board determined that potentially significant impacts on the following resources could occur as a result of the LSJR flow objectives or SDWQ objectives. These effects are further evaluated in this SED.

- Hydrology and Water Quality.
- Flooding, Sediment, and Erosion.
- Aquatic Resources.
- Terrestrial Biological Resources.
- Groundwater Resources.
- Recreational Resources and Visual Quality.
- Agricultural Resources.
- Cultural Resources.
- Energy Resources and Climate Change.

The SED is considered a program document in that it analyzes each resource area in the document at a program level. A program document may be prepared on a series of actions that can be characterized as one large project and related in connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program (State CEQA Guidelines, § 15168(a)(3)). The program-level analysis generally evaluates the broad environmental effects of the LSJR flow objectives and SDWQ objectives. Subsequent activities in the program must be examined in light of the program document to determine whether an additional environmental document must be prepared (State CEQA Guidelines, § 15168(c)). CEQA allows the use of tiering from a program document (State CEQA Guidelines, § 15152(a)). Tiering refers to using the analysis of general matters contained in broader program environmental documents, such as the one prepared for policy statements, with later environmental documents (e.g., EIRs or negative declarations). It allows the use and reference of the general discussion in subsequent EIRs and allows additional project-specific environmental review and documentation if a later activity under a program would have effects that were not examined in the program document (State CEQA

Guidelines, § 15168(c)(1)). It is anticipated that a project EIR would be prepared subsequent to this program document as part of the water rights decision process.

1.5.2 Planning Public Review and CEQA Noticing

The State Water Board considered comments received from regulatory agencies and the public during the scoping and public consultation processes in determining the scope of analysis and content of this SED. Comments received during these processes are posted on the State Water Board's website. Table 1-1 is a timeline of public involvement for the planning process, public workshops for the planning process, and CEQA noticing for the preparation of this SED.

Table 1-1. Timeline of Public Involvement for the Planning Process, Public Workshops, and CEQA Noticing

February 13, 2009	Notice of preparation (NOP) and public notice for the March 30, 2009 scoping meeting for environmental documentation and for the April 22, 2009 public staff workshop regarding the update and implementation of the *Bay-Delta Plan: Southern Delta Salinity and San Joaquin River Flows*.
March 30, 2009	Scoping meeting for environmental documentation for the update and implementation of the *Bay-Delta Plan: Southern Delta Salinity and San Joaquin River Flows*.
April 22, 2009	Public staff workshop concerning potential amendments to the 2006 Bay-Delta Plan relating to southern Delta salinity and SJR flow objectives.
June 19, 2009	Public staff workshop to provide an update regarding development of modeling alternatives and related activities for southern Delta salinity and SJR flow objectives.
August 4, 2009	Resolution 2009-0065. Adoption of the Periodic Review of the 2006 Bay-Delta Plan staff report.
August 13, 2009	Public staff workshop and availability of *Draft Study Report: Crop Salt Tolerance in the Southern Sacramento-San Joaquin River Delta,* by Dr. Glenn J. Hoffman.
November 4, 2009	Public staff workshop to discuss response to comments on salt tolerance of crops in the southern Sacramento–San Joaquin Delta.
January 5, 2010	Release of *Final Study Report: Crop Salt Tolerance in the Southern Sacramento–San Joaquin River Delta*.
March 2-3, 2010	The Vernalis Adaptive Management Program (VAMP) review.
May 11, 2010	Final VAMP report of the 2010 review panel.
October 29, 2010	Notice of public board workshop and availability of *Draft Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, as well as notice to receive comments on the draft technical report and panel participation requests to participate in the January 6 and 7, 2011 public State Water Board workshop.
November 22, 2010	Notice of opportunity for public comment for any additional information related to the SJR flow and southern Delta salinity objectives included in the *2006 Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary*.
January 6-7, 2011	Presentation and discussion of *Draft Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*.
April 1, 2011	Revised NOP and Notice of additional scoping meeting for environmental documentation for the update and implementation of the *Bay-Delta Plan: Southern Delta Salinity and San Joaquin River Flows*.
June 6, 2011	Workshop on the discussion of the clarified scope and content of the environmental information to be included in the State Water Board's environmental document relating to the State Water Board's current review of the 2006 Bay-Delta Plan.
August 12, 2011	Request for scientific peer review of the *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, as well as the study report, *Crop Salt Tolerance in the Southern Sacramento–San Joaquin River Delta*.
November 21, 2011	Web posting of peer reviews of *Technical Report on the on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*.

February 24, 2012 (updated March 5, 2012)	Notice of availability of draft technical appendices to the substitute environmental document (SED) for Phase 1 of the update to the 2006 Bay-Delta Plan. • *Draft Scientific Basis for San Joaquin River Flow and Southern Delta Salinity Objectives* (Scientific Report) (dated February 2012). • *Draft Agricultural Economic Effects of Lower San Joaquin River Flow Alternatives* (Agricultural Economics Report) (Dated February 2012). • *Draft Hydropower and Electric Grid Analysis of Lower San Joaquin River Flow Alternatives* (Hydropower Report) (dated February 2012).
February 2012	Release of *Final Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*.
March 20, 2012	Informational session on the *Agricultural Economics Report* and the *Power Production Report* to provide stakeholders an opportunity to gain a better understanding of these two reports that inform the SED analysis.

1.5.3 Areas of Known Controversy

Lead agencies must identify issues of known controversy that have been raised in the scoping process. The State Water Board considered these issues in the development of the plan amendment(s). The following lists those issues that have been identified by agencies and the public relative to the plan amendment(s) and each of these issues is addressed in this SED.

- Evaluation of a reasonable range of alternatives.
- Physical environmental impacts on agricultural resources associated with a potential reduction of surface water supplies.
- Physical environmental impacts on energy production and generation associated with potential changes to hydropower operation.
- Economic impacts on the agricultural sector and other sectors associated with the potential reduction of surface water supplies.

1.5.4 Scientific Review

The scientific basis of any statewide plan, basin plan, plan amendment, guideline, policy, or regulation must undergo external peer review before adoption by the State Water Board or Regional Water Boards (Health and Saf. Code, § 57004). Accordingly, State Water Board staff submitted a peer review request for the report contained in Appendix C, *Technical Report On The Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*. Appendix C includes draft changes to, and the scientific basis for, the LSJR flow and southern Delta water quality objectives.

The peer reviewers' comments on the technical report were largely favorable. All peer reviewers agreed with the conclusion that under the current altered flow regime, fish and wildlife beneficial uses are being impaired and that a more natural flow pattern would be beneficial to such beneficial uses. The State Water Board will respond to the peer reviewers' comments in a document that will be posted on the State Water Board's website. More information on the peer review process and on the materials submitted for review and received in response can be found at:

http://www.waterboards.ca.gov/water_issues/programs/peer_review/sanjoaquin_river_flow.shtml

1.5.5 Consultation Requirements

Upon completion of this SED, the State Water Board will consult with other public agencies having jurisdiction by law with respect to the plan amendment(s) (Cal. Code Regs., tit. 23, § 3778) and with persons having special expertise with regard to the environmental effects involved in the plan amendment(s). This consultation would occur when this SED, including the State Water Board's Environmental Checklist (Appendix B, *State Water Board's Environmental Checklist*, of this SED) and revised water quality control plan language (Appendix K, *Revised Water Quality Control Plan*, of this SED), are sent out for public comment. Consulting agencies include USBR, NMFS, DWR, DFG, the Central Valley Water Board, and the San Francisco Bay Regional Water Quality Control Board.

Consulting agencies would be involved as key partners in the amended plan's implementation, but the State Water Board is the only public agency with responsibility for approving and implementing the plan. For this reason, there are no responsible agencies as defined in State CEQA Guidelines Section 15381.

The State CEQA Guidelines define a "Trustee Agency" as a state agency that has jurisdiction by law over natural resources affected by a project. Accordingly, DFG is a Trustee Agency for the plan amendments analyzed in this SED (State CEQA Guidelines, § 15386).

1.6 Principles Guiding Preparation of this SED

This SED and the process it follows is functionally equivalent to that of CEQA. Key principles set forth by the State CEQA Guidelines, which guided the preparation of this SED, are discussed below.

1.6.1 Environmental and Non-Environmental Impacts

This SED focuses on the significant environmental impacts and their relevance to the decision-making process for the alternatives. *Environmental impacts*, as defined by CEQA, include physical effects on the environment. The State CEQA Guidelines (§ 15360) define the *environment* as follows:

> The physical conditions which exist within the areas which will be affected by a proposed project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

This definition does not include economic impacts (e.g., changes in property values) or social impacts (e.g., a particular group of persons moving into an area). The State CEQA Guidelines (§ 15131[a]) state, "economic or social effects of a project shall not be treated as significant effects on the environment." However, economic or social effects are relevant to physical effects in two situations. In the first, according to Section 15131(a) of the State CEQA Guidelines, "an EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes to physical changes caused in turn by the economic or social changes." In the second instance, according to Section 15131(b) of the State CEQA Guidelines, "economic or social effects of a project may be used to determine the significance of a physical change caused by a project."

1.6.2 Impacts Forecasting

In this SED, the State Water Board has made its best effort to predict and evaluate the reasonably foreseeable direct, indirect, and cumulative environmental impacts of the alternatives. CEQA does

not require the State Water Board to engage in speculation about impacts that are not reasonably foreseeable (State CEQA Guidelines, §§ 15144–15145). CEQA does not require a worst-case analysis.

1.6.3 Environmental Thresholds, Substantial Evidence, and Disagreement Among Experts

The threshold of significance for a given environmental effect is the level at which the State Water Board finds an effect of an alternative to be significant. A *threshold of significance* can be defined as a quantitative or qualitative standard, or set of criteria, pursuant to which significance of a given environmental effect may be determined (State CEQA Guidelines, § 15064.7 [a]). The thresholds of significance adopted by the State Water Board in its regulations, in conjunction with those in the State CEQA Guidelines, have been used as the basis of the environmental impact analysis for this SED. Some thresholds or criteria have been adapted to the specific circumstances of the alternatives. The thresholds or criteria for determining the significance of environmental impacts in this SED analysis are described under each resource area in Chapters 5–14 and Chapters 15 and 20.

The identification of impacts as significant or potentially significant is an important function of an SED. The SED must identify reasonable alternatives and feasible mitigation measures to reduce or avoid significant or potentially significant impacts. There may be no feasible mitigation measures for some impacts; therefore, an impact may remain significant and unavoidable. In preparing this document, the State Water Board has based its conclusions about the significance of environmental impacts on identifiable thresholds and has supported these conclusions with substantial evidence.

If it is known that expert opinions differ on an issue concerning the environmental impacts of the alternatives, the main points of disagreement are to be described as required by the State CEQA Guidelines. However, to be adequate under CEQA, this SED need not resolve all such disagreements.

1.6.4 Baseline

As provided by CEQA, the SED must include "a description of the environment in the vicinity of the project area as it exists before the commencement of the project" (State CEQA Guidelines, § 15125; see also, Pub. Resources Code., § 21082; 23 Cal. Code Regs., § 3777). As CEQA directs, the description of the existing conditions is "normally" the baseline against which the environmental impacts of a project and alternative actions are assessed (State CEQA Guidelines, § 15125(a)). The difference between alternatives and the baseline is then compared to a threshold to determine if the difference is significant(State CEQA Guidelines, §§ 15125, 15126, 15126.2). As discussed by the California Courts, CEQA's baseline rule allows for flexibility where quantification of "existing conditions" necessarily requires consideration of possible past or even future environmental conditions, although CEQA directs that the no project alternative should not be used as the baseline unless it is equivalent to existing conditions (see for example, *Communities for a Better Environment v. South Coast Air Quality Management District, et al., 48 Cal.4th 310 (2010); Sunnyvale West Neighborhood Association v. City of Sunnyvale City Council, 190 Cal.App.4th 1351 (2010); Pfeiffer v. City of Sunnyvale City Council, 200 Cal.App. 4th 1552 (2011)).*

1.6.5 Duty to Mitigate

An SED must describe feasible mitigation measures that would avoid or substantially reduce significant environmental impacts (State CEQA Guidelines, § 15126.4(a)). Mitigation measures are not required for effects not found to be significant. Formulation of mitigation measures should not be deferred until some future time, although measures may specify performance measures that would mitigate an adverse effect and can be accomplished in more than one way. Finally, mitigation measures must be enforceable, meaning that the lead agency must ensure that the measures will be imposed through appropriate permit conditions, agreements, or other legally binding instruments. CEQA grants a public agency the authority to use its discretionary powers to mitigate or avoid significant effect on the environment associated when it is feasible to do so (State CEQA Guidelines, § 15040). CEQA, however, does not grant an agency new powers beyond those granted by other laws.

1.6.6 Requirement to Evaluate Alternatives

A range of reasonable alternatives to a proposed project or to the location of a proposed project that could feasibly attain most of the basic objectives of the proposed project, but would avoid or substantially lessen any significant environmental impacts, must be evaluated in the SED (State CEQA Guidelines, § 15126.6). Chapter 3 of this SED, *Alternatives Description*, sets forth the range of reasonable alternatives evaluated for the plan amendments. This SED also describes a No Project Alternative (Chapter 15, *LSJR Alternative 1 and SDWQ Alternative 1 [No Project Alternative]* and Appendix D, *Evaluation of LSJR Alternative 1 and SDWQ Alternative 1 [No Project Alternative]*) and an environmentally superior alternative (Chapter 17, *Summary of Impacts and Comparison of Alternatives*), and the Preferred LSJR and SDWQ Alternatives (Chapter 20, *Preferred LSJR Alternative and SDWQ Alternative*).

An SED is governed by the *rule of reason* that requires the identification of only those alternatives necessary to permit a reasoned choice between the alternatives. An SED need not consider an alternative that would be infeasible. State CEQA Guidelines Section 15126.6 explains that the evaluation of project alternative feasibility can consider site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site. The SED is also not required to evaluate an alternative that has an effect that cannot be reasonably identified or that has remote or speculative implementation and that would not achieve the basic project objectives.

1.7 Availability of SED

The public comment period for the SED is December 31, 2012 through 12noon on March 5, 2013. The SED documents are available for public review during the comment period, on week days (except for State Holidays on January 1, January 21, and February 18, 2013) from 8:30 a.m. to 5:00 p.m. at: Division of Water Rights Records Unit, State Water Resources Control Board, 1001 “I” Street, 2nd Floor, Sacramento, CA 95814.

The SED documents will also be available for public review after January 4, 2013, at the following public libraries in Calaveras, Contra Costa, Mariposa, Merced, Sacramento, San Joaquin, Stanislaus, Tuolumne and Alameda Counties:

- Calaveras County Central Library, 1299 Gold Hunter Rd., San Andreas, CA 95249.
- Pleasant Hill Library, 1750 Oak Park Blvd., Pleasant Hill, CA 94523.
- Mariposa County Library, 4978 10th St., Mariposa, CA 95338.
- Merced County Library, 2100 O St., Merced, CA 95340.
- Sacramento Central Library, 828 "I" St., Sacramento, CA 95814.
- Cesar Chavez Central Library, 605 N. El Dorado St., Stockton, CA 95202.
- Stanislaus County Library, 1500 "I" St., Modesto, CA 95354.
- Tuolumne County Library, 480 Greenley Rd., Sonora, CA 95370.
- Alameda County Main Library, 2400 Stevenson Blvd., Fremont, CA 94538.
- San Francisco County Library Main Branch, 100 Larkin St., San Francisco, CA 94102

A link to electronic copies of the SED documents is available on the State Water Board's website at: http://www.waterboards.ca.gov. Alternatively, for a reasonable cost for copying, you may obtain an electronic copy of the documents on disk by contacting the Division of Water Rights Records Unit at (916) 341-5421 or at dwr@waterboards.ca.gov.

1.8 SED Organization

This SED has been organized to ensure that the reader can easily obtain information about the alternatives and their impacts on environmental resources. Impacts are covered under each of the environmental resource areas in Chapters 5–14 and in Chapters 15 and 20. Detailed technical and additional background information is provided in the appendices. Each of the chapters in this document is briefly described in Table 1-2.

Table 1-2. Organization and Contents of this SED

SED Chapter	Description
Executive Summary	Summarizes the alternatives, potential significant impacts and mitigation measures, public comments and concerns, and unresolved issues and areas of controversy.
Chapter 1 – Introduction	Describes the purpose, need, and objectives of the alternatives; the intended uses of the document; the scope and content of the document; and the organization of the document.
Chapter 2 –Water Resources	Describes the baseline environmental and operational conditions of existing water resources within the geographic range of the alternatives.
Chapter 3 – Alternatives Description	Describes the purpose, need, and objectives of the alternatives, and describes the alternatives evaluated in this document.
Chapter 4 – Introduction to Analysis	Describes the baseline, the scope of analysis and resource chapters, and provides a summary of the different methodologies used in the resource chapters.
Chapters 5–14	Describe, for each environmental resource area, the environmental setting (including the baseline conditions), the regulatory setting, the criteria for judging whether an impact is significant, the impact assessment methodology, the impacts that would result from the alternative(s), and the applicable mitigation measures that would eliminate or reduce significant impacts.
Chapter 15 – LSJR Alternative 1 and SDWQ Alternative 1(No Project Alternative)	Provides an analysis of the LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative).
Chapter 16 – Cumulative Impact Summary, Growth-Inducting Effects and Irreversible Commitment of Resources	Provides a summary of significant cumulative impacts and whether or not each alternative contributes to significant cumulative impacts. Also presents whether or not each alternative would result in growth-inducing impacts. Describes the direct and indirect growth inducting effects of the alternatives and the significant irreversible changes associated with the alternatives.
Chapter 17 – Summary of Impacts and Comparison of Alternatives	Compares the impacts of each alternative and identifies the environmentally superior alternative in accordance with CEQA.
Chapter 18 – Economic Analyses	Provides a discussion of the direct and regional economic costs and benefits associated with the different alternatives.
Chapter 19 – Antidegradation Analysis	Analyzes the State Water Board's Resolution 68-16 (Antidegradation Policy), which protects surface water and groundwater from degradation.
Chapter 20 – Preferred LSJR Alternative and SDWQ Alternative	Describes the preferred LSJR and SDWQ alternatives and their associated impact analyses.
Chapter 21 – List of Preparers	Lists the individuals involved in preparing and reviewing this SED.
Appendices A–L	Presents additional background information, analysis, and technical detail for the resource areas.

1.9 References

California Department of Fish and Game (DFG). 2011. Ecosystem Restoration Program Conservation Strategy for Restoration of the Sacramento-San Joaquin Delta Ecological Management Zone and the Sacramento and San Joaquin Valley Regions. July.

CALFED Bay-Delta Program (CALFED). 2000. Ecosystem Restoration Program Plan Strategic Plan for Ecosystem Restoration. CALFED, Final Programmatic EIS/EIR Technical Appendix. Sacramento, CA.

State Water Resources Control Board (State Water Board). 1978. Water Quality Control Plan for the Sacramento–San Joaquin Delta and Suisun Marsh. August. (page VI-16 – VI-19).

State Water Resources Control Board (State Water Board). 2006. Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary. December 13.