

Final Supplemental Environmental Assessment

Interim Flows Project – Water Year 2012



Table of Contents

1.0	Introduction and Statement of Purpose and Need.....	1-1
1.1	Introduction.....	1-1
1.2	Purpose and Need for the Proposed Action.....	1-2
1.2.1	Project Background	1-2
1.2.2	Statement of Purpose and Need for Proposed Action	1-5
1.3	Need for a Supplemental EA.....	1-5
1.3.1	Environmental Review Background	1-5
1.3.2	Statement of Purpose and Need for this Supplemental EA.....	1-7
1.4	Study Area.....	1-8
1.5	Document Organization	1-11
2.0	Description of Alternatives.....	2-1
2.1	No-Action Alternative	2-1
2.2	Proposed Action	2-2
2.2.1	Interim Flow Releases Under the Proposed Action	2-2
2.2.2	Recapture and Recirculation	2-7
2.2.3	Settlement Flow Schedules	2-13
2.2.4	Flow Considerations by Reach.....	2-17
2.2.5	Additional Implementation Considerations.....	2-18
2.2.6	Environmental Commitments.....	2-22
2.2.7	Public Draft 2010 Annual Technical Report.....	2-32
2.2.8	WY 2011 Interim Flows Monitoring.....	2-33
2.2.9	Restoration Administrator 2011 Spring Interim Flow Program Real-Time Management Recommendations	2-41
2.3	Relationship to Related Projects	2-43
3.0	Affected Environment and Environmental Consequences	3-1
3.1	Changes to the Affected Environment.....	3-1
3.1.1	Biological Resources – Terrestrial Resources.....	3-7
3.1.2	Biological Resources – Fish	3-7
3.1.3	Hydrology and Water Quality	3-7

3.2	Environmental Consequences Analysis	3-8
3.2.1	Resource Topics Not Requiring Further Evaluation.....	3-8
3.2.2	Resource Topics Potentially Affected by the Proposed Action.....	3-12
3.2.3	Mandatory Findings of Significance.....	3-18
3.2.4	Indian Trust Assets	3-21
3.2.5	Socioeconomic Effects and Environmental Justice	3-21
3.2.6	Mitigation Measures	3-21
4.0	Consultation and Coordination.....	4-1
4.1	Consultation and Coordination for WY 2010 Final EA/IS.....	4-1
4.2	Consultation and Coordination for WY 2011 Draft and Final Supplemental EA	4-1
4.3	Current Steps in the NEPA Review Process	4-2
5.0	List of Preparers	5-1
	United States Department of the Interior, Bureau of Reclamation Mid-Pacific Regional Office	5-1
6.0	Literature Cited	6-1

Appendices

Appendix A –	Water Year 2010 Interim Flows Project - Final Environmental Assessment and Finding of No Significant Impact/Initial Study and Mitigated Negative Declaration
Appendix B –	Draft and Final Supplemental Environmental Assessments for the WY 2011 Interim Flows Project and Finding of No Significant Impact
Appendix C –	Restoration Administrator 2011 Spring Interim Flow Program Real-Time Management Recommendations
Appendix D –	Steelhead Monitoring Plan
Appendix E –	2009-2013 Interim Flow Release Program, Water Quality Monitoring Plan
Appendix F –	2010 Annual Technical Report
Appendix G –	Seepage Monitoring and Management Plan
Appendix H –	Mendota Pool Water Quality Response Plan
Appendix I –	Draft San Joaquin River Underseepage Limiting Capacity Analysis
Appendix J –	Draft Restoration Flow Guidelines, February 2011
Appendix K –	Responses to Comments Received on the Draft Supplemental WY 2012 Interim Flows EA

Tables

Table 2-1. Example Estimated Regulated Nonflood Flows from Friant Dam Under the Proposed Action in a Wet Year ¹	2-3
Table 2-2. Example Change in Estimated Regulated Nonflood Flows Under the Proposed Action from No-Action Alternative in Wet Years ¹	2-4
Table 2-3. Maximum Interim Flow Release from Friant Dam Under the Proposed Action ..	2-6
Table 2-4. Overview of the Recapture Locations under the Proposed Project	2-9
Table 2-5. Estimated Maximum Water Available for Recapture and Recirculation Under the Proposed Action.....	2-12
Table 2-6. Estimated Water Year 2012 Maximum Interim Flow Capacity by Reach.....	2-13
Table 2-7. Restoration Year Types as Defined in Exhibit B of the Settlement	2-14
Table 2-8. Summary of Flow Capacity in Each Reach Where the Outside Ground Elevation is Within One Foot of the In-Channel Capacity Discharge.....	2-20
Table 2-9. Real-Time Monitoring Physical Parameters	2-27
Table 2-10. Real Time Water Quality Monitoring Sites.....	2-28
Table 2-11. Components of the SJRRP Flow-Related Monitoring and Management.....	2-32
Table 3-1. Summary of Changes to the Affected Environment and Environmental Consequences Analyses from the WY 2010 Final EA/IS	3-2

Figures

Figure 1-1. Water Year 2012 Interim Flows Study Area.....	1-9
Figure 1-2. San Joaquin River Reaches and Flood Bypass System in the Restoration Area ..	1-10
Figure 2-1. Restoration Flow Schedules by Restoration Year-Type, as Specified in Exhibit B of the Settlement	2-16
Figure 2-2. Electrical Conductivity of Surface Water at the Chowchilla Bifurcation station, Sack Dam, and the Delta Mendota Canal at Mendota Pool.....	2-34

List of Abbreviations and Acronyms

Act	San Joaquin River Restoration Settlement Act
ATR	Annual Technical Report
BA	Biological Assessment
Banks	Harvey O. Banks Pumping Plant
BNLL	Blunt Nose Leopard Lizard
BO	Biological Opinion
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CVP	Central Valley Project
Delta	Sacramento-San Joaquin Delta
D-1641	Water Rights Decision 1641
DMC	Delta Mendota Canal
DO	Dissolved Oxygen
DPS	Distinct Population Segment
DWR	Department of Water Resources
EA	Environmental Assessment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact
FONNSI	Finding of No New Significant Impact
IS	Initial Study
Jones	C.W. Bill Jones Pumping Plant
MND	Mitigated Negative Declaration
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act

NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NOP	Notice of Preparation
NRDC	Natural Resources Defense Council
NTU	Nephelometric Turbidity Unit
PEIS/R	Program Environmental Impact Statement/Report
RA	Restoration Administrator
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
ROD	Record of Decision
RPA	Reasonable and Prudent Alternative
Settlement	Stipulation of Settlement in <i>NRDC, et al. v. Kirk Rodgers, et al.</i>
SJR	San Joaquin River
SJRRP	San Joaquin River Restoration Program
State	State of California
SMND	Subsequent Mitigated Negative Declaration
SWP	State Water Project
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TAF	Thousand Acre-Feet
µ/L	Micrograms per Liter
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VAMP	Vernalis Adaptive Management Plan
WY	Water Year

1.0 Introduction and Statement of Purpose and Need

1.1 Introduction

The San Joaquin River Restoration Program (SJRRP) was established in late 2006 to implement the Stipulation of Settlement in *NRDC, et al. v. Kirk Rodgers, et al.* (Settlement). As an initial action to guide implementation, the Settlement required that the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), modify releases from Friant Dam beginning in Water Year 2010 (WY 2010 or from October 1, 2009, to September 30, 2010). As described in the Settlement, water releases from Friant Dam prior to release of full Restoration Flows are referred to as Interim Flows. Reclamation, as the lead agency under the National Environmental Policy Act (NEPA), and the California Department of Water Resources (DWR), as the lead agency under the California Environmental Quality Act (CEQA) prepared an Environmental Assessment/Initial Study (EA/IS) to evaluate activities necessary to convey the flows in the San Joaquin River from Friant Dam to the Sacramento-San Joaquin Delta (Delta), and to conduct data collection and monitoring activities during Interim Flow releases during Water Year (WY) 2010. The Draft EA/IS for the WY 2010 Interim Flows Project was made available for public comment on June 3, 2009. Public and agency comments were reviewed and responses to comments were incorporated in the Final EA/IS for the WY 2010 Interim Flows Project. Reclamation approved the Finding of No Significant Impact (FONSI) and DWR adopted the Mitigated Negative Declaration (MND) on September 25, 2009. A Draft Supplemental EA for WY 2011 Interim Flows was prepared and made available for public comment and review on June 11, 2010 with the comment period ending on July 23, 2010. The Final Supplemental EA for WY 2011 Interim Flows and signed Finding of No Significant Impact was issued on September 21, 2010.

The intent of the Interim Flows Project is to allow data to be collected on flows, temperatures, fish needs, seepage losses, and water recirculation, recapture, and reuse. These data will be useful in evaluating channel characteristics and capacity, infiltration losses, levee stability and seepage, water temperature, fish management, and recapture conditions. This Supplemental EA is being prepared to extend the period of modified releases of water from Friant Dam for an additional year (WY 2012 or October 1, 2011 to September 30, 2012) in accordance with the flow schedule in Exhibit B of the Settlement, and in a manner consistent with Federal, State and local laws, and any agreements with downstream agencies, entities, and landowners. The Proposed Action includes continuation of activities necessary to convey the flows in the San Joaquin River from Friant Dam to the Delta, and to continue data collection and monitoring activities during Interim Flow releases consistent with the provisions and conditions described in the WY 2010 Interim Flows Final EA/IS and the Supplemental WY 2011 Interim Flows Final

EA. Authorization for implementing the Settlement, including release of WY 2012 Interim Flows, is provided in the San Joaquin River Restoration Settlement Act (Act) (Public Law 111-11).

Although the WY 2010 Final EA/IS was a joint federal and state environmental document, it has been determined that a Supplemental EA will be prepared to satisfy the requirements of the National Environmental Policy Act (NEPA). DWR did not have the same discretionary action necessary to implement WY 2011 Interim Flow releases as described in the WY 2010 Final EA/IS, and will not have discretionary actions for WY 2012 Interim Flow releases. Therefore, there is not a California Environmental Quality Act (CEQA) review requirement for DWR related to the release of WY 2012 Interim Flows. Reclamation is preparing this Supplemental EA consistent with its lead role in preparing and releasing the Program Environmental Impact Statement/Report (PEIS/R) for the implementation of the Settlement and the San Joaquin River Restoration Settlement Act (Act).

The WY 2011 Interim Flows Project, as approved and authorized, is currently underway. The purpose of this Supplemental EA is to describe and analyze the effects of an additional year of Interim Flows for WY 2012. This document extends the project originally described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EA for the WY 2011 Interim Flows Project for one additional year, but generally does not change other aspects of the project. This Supplemental EA includes a review of the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EA for the WY 2011 Interim Flows Project and synthesizes discussions/results where conditions have not changed, and evaluates potential impacts due to implementation of WY 2012 Interim Flows in consideration of changed conditions or new data/information that have occurred since the approval of the Final Supplemental EA for WY 2011 Interim Flows. The results of this Supplemental EA will provide the basis for determining whether a Finding of No Significant Impact (FONSI) can be issued or if additional environmental review such as an Environmental Impact Statement is required.

Additionally, Reclamation will submit a petition for temporary transfer of water (less than 1 year), pursuant to California Water Code Section 1725 et seq., to address the release and redirection of WY 2012 Interim Flows. In acting on a water right petition, the State Water Resources Control Board (SWRCB) must consider potential impacts to other legal users of the water, and whether there would be any unreasonable effects from the transfer on fish, wildlife, or other instream beneficial uses. This Supplemental EA will be used to support Reclamation's petition to the SWRCB.

1.2 Purpose and Need for the Proposed Action

1.2.1 Project Background

In 1988, a coalition of environmental groups, led by the Natural Resources Defense Council (NRDC), filed a lawsuit challenging renewal of long-term water service contracts between the United States and Central Valley Project (CVP) Friant Division

1 contractors. After more than 18 years of litigation of this lawsuit, known as *NRDC, et al.,*
2 *v. Kirk Rodgers, et al.*, a settlement was reached. On September 13, 2006, the Settling
3 Parties, including NRDC, Friant Water Users Authority, and the U.S. Departments of the
4 Interior and Commerce, agreed on the terms and conditions of the Settlement, which was
5 subsequently approved by the U.S. Eastern District Court of California on October 23,
6 2006.

7
8 The Settlement establishes two primary goals:

- 9 • **Restoration Goal** – To restore and maintain fish populations in “good condition”
10 in the main stem San Joaquin River below Friant Dam to the confluence of the
11 Merced River, including naturally reproducing and self-sustaining populations of
12 salmon and other fish.
- 13 • **Water Management Goal** – To reduce or avoid adverse water supply impacts on
14 all of the Friant Division long-term contractors that may result from the Interim
15 Flows and Restoration Flows provided for in the Settlement.

16 The SJRRP will implement the Settlement and the Act. The “Implementing Agencies”
17 responsible for managing and implementing the SJRRP include the U.S. Department of
18 the Interior, through Reclamation and the U.S. Fish and Wildlife Service (USFWS), the
19 U.S. Department of Commerce through the National Marine Fisheries Service (NMFS),
20 and the State of California (State) Natural Resources Agency through DWR and the
21 California Department of Fish and Game (CDFG). The Settlement also stipulates the
22 appointment of a Restoration Administrator (RA), who is to make recommendations to
23 the U.S. Secretary of the Interior (Secretary), in consultation with a technical advisory
24 committee, to help meet the Restoration Goal.

25
26 The RA also consults with the Technical Advisory Committee on topics including how
27 River Restoration hydrographs are to be implemented; when Buffer Flows (two releases
28 of up to an additional 10 percent of the applicable hydrograph flows) may be needed; and
29 Interim Flows for data collection purposes.

30
31 The Settlement identifies the releases of both Interim Flows and Restoration Flows. The
32 Settlement stipulates the release of Interim Flows beginning no later than October 1,
33 2009, and continuing until full Restoration Flows begin on January 1, 2014, whichever
34 occurs first. The intent of the Interim Flows release is to enable collection of relevant data
35 on flows, temperatures, fish needs, seepage losses, and water recirculation, recapture, and
36 reuse. Full Restoration Flows are described in Exhibit B of the Settlement that was
37 provided as Appendix B of the Final EA/IS for the WY 2010 Interim Flows Project.

38
39 Specific issues related to the overall program objectives that were to be addressed
40 beginning in WY 2010 and will be continued into WY 2012, are identified as problem
41 statements or monitoring recommendations in the 2010 Annual Technical Report for WY
42 2010 Interim Flows, targeted actions in the Fisheries Implementation Plan 2009-2010,
43 actions presented in the Final 2011 Agency Plan, and the Seepage Monitoring and
44 Management Plan. Fishery issues associated with Interim Flows and prioritized for
45 investigations include water quality, water temperature, aquatic habitat, instream fish

1 passage, spawning habitat, and benthic macroinvertebrate communities. The
2 recommendations from these reports are briefly outlined below, and will be relevant to
3 studies performed during WY 2012 Interim Flows:

- 4
- 5 • Juvenile fall-run Chinook experimental survival and migration study to identify
- 6 areas contributing to smolt survival or mortality.
- 7 • Analysis of the Sand Slough Control Structure at the head of Reach 4B, the study
- 8 of downstream sedimentation, and its relation to groundwater elevations on
- 9 adjoining lands.
- 10 • Conduct flow record analysis, travel times, and restriction analyses.
- 11 • Implementation of the Steelhead Monitoring Plan for Interim Flow releases.
- 12 • Continuation and analysis of water temperature data collection.
- 13 • Identify a relationship between San Joaquin River flow and groundwater levels to
- 14 help guide Restoration Flow releases in managing the potential for adverse
- 15 effects, including seepage and channel capacity limitations.
- 16 • Identify San Joaquin River hydraulics, including channel geometry, sediment
- 17 mobilization thresholds and rates, and flow routing, sufficient to preserve flow
- 18 conveyance.
- 19 • Conduct a benthic macroinvertebrate assessment and hyporheic pot studies to
- 20 establish baseline measures to estimate the effect of Restoration Flows and other
- 21 SJRRP actions on the ecological integrity and water quality conditions, as
- 22 indicated by changes in assemblages in the Restoration Area.
- 23 • Identify and prioritize fish passage barriers in the Restoration Area.
- 24 • Quantify potential salmon spawning habitat availability.
- 25 • Evaluate adult salmon recruitment and passage.
- 26 • Evaluate smolt survival, outmigrants, and fry production.
- 27 • Determine water quality conditions at potential, spring-run Chinook salmon
- 28 holding pools. Monitor water quality with a focus on selenium, dissolved oxygen
- 29 (DO) levels, and total ammonia, and nitrogen.
- 30 • Document thermal response of upper San Joaquin River Basin water operations in
- 31 conjunction with environmental conditions; evaluate the relationship between
- 32 discharge from Millerton Reservoir and water temperatures in the San Joaquin
- 33 River, including support, development, and calibration of a temperature model to
- 34 simulate the relationships between water management operations and water
- 35 temperatures.

1.2.2 Statement of Purpose and Need for Proposed Action

NEPA regulations require a statement of “the underlying purpose and need to which the agency is responding in proposing the alternatives, including the Proposed Action” (40 Code of Federal Regulations (CFR) 1502.13).

The purpose of the Proposed Action has not changed from WY 2010 to WY 2011, and from WY 2011 to WY 2012 and is to implement the provisions of Paragraph 15 of the Settlement pertaining to Interim Flows. The need for action is to support collection of relevant data to guide future releases of Interim Flows and Restoration Flows under the SJRRP. The two key objectives of the Proposed Action are as follows:

- Release of Interim Flows according to the Settlement and the Act, as limited by downstream channel capacities, and consistent with Federal, State, and local laws, and any agreements with downstream agencies and entities.
- Collect data to better evaluate flows, temperatures, fish needs, biological effects, and seepage losses, and water recirculation, recapture, and reuse opportunities for future Interim Flows and Restoration Flows.

1.3 Need for a Supplemental EA

1.3.1 Environmental Review Background

On June 3, 2009, Reclamation and DWR released the Draft EA/IS for the WY 2010 Interim Flows Project for public review and comment. The Draft EA/IS (State Clearinghouse #2009061019) identified two alternatives: the No-Action Alternative and the Proposed Action. On September 25, 2009, Reclamation signed the FONSI and DWR signed the MND for the Proposed Action identified in the WY 2010 Final EA/IS. On June 11, 2010, Reclamation released the Draft Supplemental EA for the WY 2011 Interim Flows Project. The Final Supplemental EA and FONSI for the WY 2011 Interim Flows Project was released on September 21, 2010.

Interim Flow releases from Friant Dam began at 350 cubic feet per second (cfs) on October 1, 2009. Interim flow releases were increased to 700 cfs on November 1, 2009, and then reduced back to 350 cfs on November 11, 2009. Interim Flows during this period reached downstream of Sack Dam (River Mile 182). Friant Dam releases were decreased from 350 cfs back to riparian demand (approximately 120 cfs) on November 21, 2009. Interim Flow releases resumed on February 1, 2010 at 350 cfs. On March 1, 2010, Interim Flows increased to 500 cfs and were further increased to 800 cfs on March 16, 2010. The next scheduled Interim Flow increase was to occur on March 25, 2010. However, on March 25, 2010, Reclamation determined that the surface and groundwater system had not yet stabilized and delayed the flow increase to March 29, 2010. Reclamation increased Interim Flow releases from Friant Dam to 1,100 cfs on March 29, 2010, followed by an increase on April 12, 2010, to 1,500 cfs. Subsequent changes in releases, ranging from 1,100 cfs to 1,350 cfs were made between April 13 and May 1, 2010, to achieve a 700 cfs flow downstream of Sack Dam. On May 1, 2010, the Interim Flow release was increased from 1,350 cfs to 1,550 cfs, in order to provide 1,400

1 cfs at Gravelly Ford. On March 21, 2011 Interim Flow releases from Friant Dam ceased
2 when reservoir storage and inflow predictions resulted in the need to release flood flows
3 from Millerton Lake Reservoir. On July 16, 2011 Interim Flow releases from Friant Dam
4 began at 350 cfs. As of the date of the release of this Supplemental EA for the WY 2012
5 Interim Flows Project, Interim Flows remain at 350 cfs.
6

7 During fall WY 2011 Interim Flows, releases past Sack Dam were held at 80 cfs and then
8 subsequently reduced to 50 cfs to address downstream seepage concerns from
9 neighboring landowners. From February 1 through March 21, 2011, flows past Sack
10 Dam were held at or below 50 cfs due to groundwater elevation constraints in Reach 4.
11 This did not result in hydrologic connectivity of the upper reaches of the San Joaquin
12 River above the Merced River with the lower reaches below the Merced River. On
13 March 21, 2011 Interim Flow releases from Friant Dam ceased when reservoir storage
14 and inflow predictions resulted in the need to release flood flows from Millerton Lake
15 Reservoir. As of the date of the release of this Supplemental EA for the WY 2012
16 Interim Flows Project, flood flow releases are still continuing and will likely continue for
17 an additional undetermined time frame based on reservoir inflow predictions.
18

19 The WY 2012 Interim Flows will be consistent with the Settlement and are guided by
20 Reclamation's determination of water year type. For WY 2012 Interim Flows, all flows
21 will be limited such that adverse impacts to lands from seepage will be avoided or
22 reduced. Reclamation is prepared to reduce flows, when necessary, if information from
23 the groundwater monitoring network or from local landowners indicates that seepage or
24 related impacts may occur.
25

26 The original schedule indicated that Interim Flows from October 1, 2009 through
27 September 30, 2010 would proceed as evaluated in the WY 2010 Final EA/IS, and from
28 October 1, 2010 through September 30, 2011 under the Draft and Final Supplemental
29 EA for the WY 2011 Interim Flows Project. After such time, it was anticipated a Final
30 PEIS/R, Program Biological Assessment, Program Biological Opinion, and the related
31 Record of Decision (ROD) would be issued prior to October 1, 2011. Thus, the
32 environmental compliance and permitting for WY 2012 Interim Flows and beyond would
33 be obtained as part of the PEIS/R ROD and programmatic permitting process. Due to
34 unanticipated schedule changes, it is unlikely that finalization of the PEIS/R, issuance of
35 the ROD, and acquisition of all required permits for post-WY 2011 Interim Flows will
36 occur prior to September 30, 2011. Therefore, it is critical that an alternative
37 environmental review and permitting process be undertaken to allow for an additional
38 year of Interim Flows for WY 2012.
39

40 The Settlement requires a program of Interim Flows to begin no later than October 1,
41 2009 and are to continue until full Restoration Flows begin. The Interim Flows will be
42 used to collect data related to flows, temperatures, fish needs, seepage, recirculation,
43 recapture, and reuse. The Settlement states that if the highest priority channel
44 improvements are not completed as specified in subsequent years so as to allow full
45 Restoration Flows, Interim Flows will continue at timing and magnitude developed for
46 the specific water year type hydrograph, and will not exceed existing channel capacities.

1 Therefore, this Supplemental EA addresses an additional year of Interim Flows for WY
2 2012 (October 1, 2011 through September 30, 2012). The Supplemental EA has been
3 prepared using the existing Water Year 2010 Interim Flows Project - Final Environmental
4 Assessment and Finding of No Significant Impact/Initial Study and Mitigated Negative
5 Declaration and the Draft and Final Supplemental EA for the WY 2011 Interim Flows
6 Project to form the basis of the Supplemental EA and proposed FONSI. Therefore, these
7 documents are incorporated by reference in their entirety into this Supplemental EA.

8 **1.3.2 Statement of Purpose and Need for this Supplemental EA**

9 This document has been prepared to satisfy the NEPA requirements for implementation
10 of the WY 2012 Interim Flows and supporting the permitting effort. The purpose and
11 need for continuation of Interim Flows during WY 2012 is to implement the provisions of
12 Paragraph 15 of the Settlement as authorized and directed in the Act and as described
13 above in Section 1.2.2.
14

1

2 **1.4 Study Area**

3 The study area for this Supplemental EA is the same as that identified in the Final EA/IS
 4 for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the
 5 WY 2011 Interim Flows Project and includes areas that may be affected directly,
 6 indirectly, or cumulatively by the Proposed Action. The study area, shown in Figure 1-1,
 7 has been broadly defined to include the San Joaquin River upstream from Friant Dam, the
 8 Restoration Area, the San Joaquin River from the confluence with the Merced River to
 9 the Delta, the Delta, and portions of the CVP/State Water Project (SWP) water service
 10 areas, including the Friant Division. The Restoration Area, which is the San Joaquin
 11 River from Friant Dam to the confluence of the Merced River, is shown in Figure 1-2.
 12 The San Joaquin River and flood bypasses within the Restoration Area are described as a
 13 series of physically and operationally distinct reaches, as shown in Figure 1-2 and defined
 14 in Table 1-1. Table 1-1 also identifies the river reaches and bypasses included in the
 15 study area for this Supplemental EA.

16

17

18

Table 1-1
San Joaquin River Reaches and Flood Bypasses in the Restoration Area

San Joaquin River Reaches and Flood Bypasses in Restoration Area				Restoration Area Reaches Included in Water Year 2012 Interim Flows Study Area
River or Bypass	Reach	Head of Reach or Bypass	Downstream End of Reach or Bypass	
San Joaquin River	1A	Friant Dam	State Route 99	✓
	1B	State Route 99	Gravelly Ford	✓
	2A	Gravelly Ford	Chowchilla Bypass Bifurcation Structure	✓
	2B	Chowchilla Bypass Bifurcation Structure	Mendota Dam	✓
	3	Mendota Dam	Sack Dam	✓
	4A	Sack Dam	Sand Slough Control Structure	✓
	4B1	Sand Slough Control Structure	Confluence with Mariposa Bypass	
	4B2	Confluence with Mariposa Bypass	Confluence with Bear Creek and Eastside Bypass	✓
	5	Confluence with Bear Creek and Eastside Bypass	Confluence with Merced River	✓
Chowchilla Bypass		Chowchilla Bypass Bifurcation Structure	Confluence with Fresno River and Eastside Bypass	
Eastside Bypass		Confluence with Fresno River and Chowchilla Bypass	Confluence with Bear Creek and San Joaquin River	✓
Sand Slough Bypass		Sand Slough Control Structure	Eastside Bypass	✓
Mariposa Bypass		Mariposa Bypass Bifurcation Structure	Confluence with San Joaquin River	✓

19

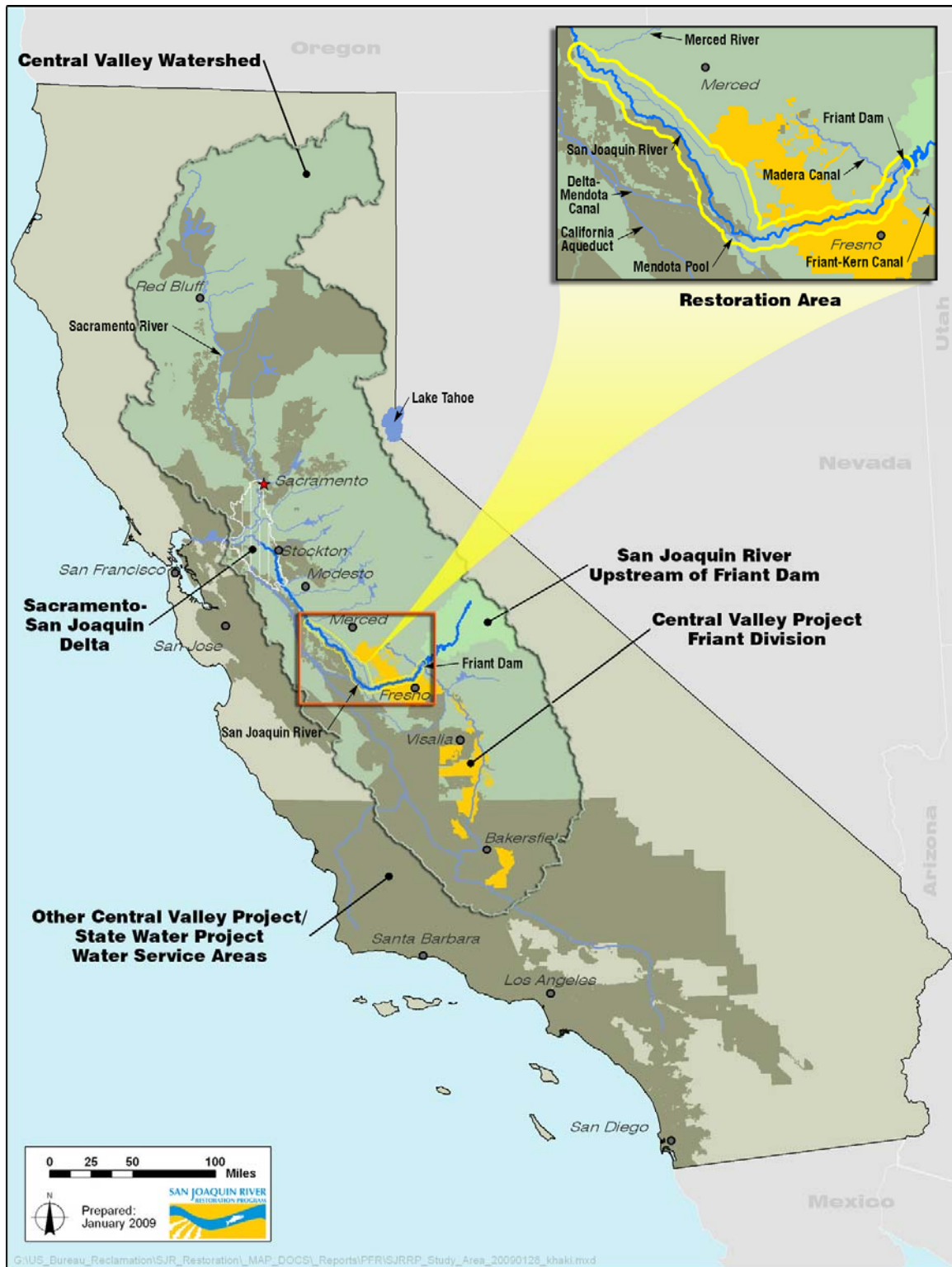


Figure 1-1.
Water Year 2012 Interim Flows Study Area

1
2
3
4

San Joaquin River Restoration Program



1
2
3

Figure 1-2.
San Joaquin River Reaches and Flood Bypass System in the Restoration Area

1.5 Document Organization

This document is divided into the following sections:

- **Section 1, Introduction and Statement of Purpose and Need**, introduces the Proposed Action, and provides background information; describes the purpose of and need for the Proposed Action; discusses the purpose of this Supplemental EA; provides study area information; and describes document organization.
- **Section 2, Description of Alternatives**, describes the No-Action Alternative, changes or new information made available since preparation of the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, and the Proposed Action analyzed in this Supplemental EA.
- **Section 3, Affected Environment and Environmental Consequences**, describes the similarities and differences between the environmental setting, the impact analysis methodology, and the analytical results used for this Supplemental EA from those presented in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project.
- **Section 4, Consultation and Coordination**, describes the public involvement in the NEPA and CEQA review process for previous efforts and for this Supplemental EA.
- **Section 5, List of Preparers**, presents agency staff and consultants directly responsible for preparing or reviewing this document.
- **Section 6, Literature Cited**, lists references cited in this Supplemental EA.

The appendices to the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project also pertain to this Supplemental EA and are incorporated by reference with that document. Appendices to this Supplemental EA, providing pertinent supporting information and data used while preparing this document, are include as follows:

Appendix A –Final Environmental Assessment and Finding of No Significant Impact/Initial Study and Mitigated Negative Declaration for the Water Year 2010 Interim Flows Project

Appendix B – Water Year 2011 Interim Flows Project – Supplemental Draft and Final Environmental Assessments and Finding of No Significant Impact

Appendix C – Restoration Administrator Spring 2011 Interim Flow Program Real-Time Management Recommendations, April 23, 2011

Appendix D –Steelhead Monitoring Plan

Appendix E – 2009-2013 Interim Flow Release Program, Water Quality Monitoring Plan

Appendix F – 2010 Annual Technical Report

Appendix G – Seepage Monitoring and Management Plan

Appendix H – Mendota Pool Water Quality Response Plan

Appendix I - Draft San Joaquin River Underseepage Limiting Capacity Analysis

This page left blank intentionally.

2.0 Description of Alternatives

The NEPA No-Action Alternative and the Proposed Action are described in this section. The No-Action Alternative represents existing conditions in the San Joaquin River and existing operations at Friant Dam because of the immediate short-term nature of the Proposed Action. The Proposed Action is the implementation of the WY 2012 Interim Flows, including the release and potential downstream recapture of Interim Flows, the activities necessary to convey the flows in the San Joaquin River from Friant Dam to the Delta, and monitoring activities to be conducted during the WY 2012 Interim Flow releases. Additional details are provided in the following sections.

2.1 No-Action Alternative

The No-Action Alternative includes the continued operation of Friant Dam under existing conditions. Because the Draft and Final EA for the WY 2010 Interim Flows Project was prepared as a joint NEPA/CEQA document, the language and analysis provided here for the No-Action Alternative is prepared in a similar manner for consistency, although there is no discretionary action on the part of the State for the WY 2012 Interim Flows Project. Under CEQA Guidelines section 15125(a), the physical environmental conditions, as they exist at the time of the environmental analysis is commenced, “will normally constitute the baseline conditions by which a Lead Agency determines whether an impact is significant.” (See also CEQA Guidelines §15126.2(a).). Under NEPA, the affected environment is usually similar to or the same as the existing conditions used to determine the environmental impacts under CEQA. However, the Interim Flows in accordance with the flow schedule in Exhibit B of the Settlement and as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project are in effect now and are generally the same as the WY 2012 Interim Flows considered under this Supplemental EA. Thus, if the WY 2011 Interim Flows were used as the baseline physical conditions for the environmental analysis, then the analysis would show no changes between the baseline physical conditions and the Proposed Action, because they would be the same. For this reason, and because the WY 2011 Interim Flows are scheduled to end on September 30, 2011, the baseline for the analysis of potential environmental impacts associated with implementation of the WY 2012 Interim Flows assumes that WY 2011 Interim Flows are not in place and that the existing conditions (and No-Action Alternative) operations characterized in the WY 2010 Final EA/IS would be in place (see Sections 2 and 3 of the Final EA/IS for the WY 2010 Interim Flows Project for a more detailed discussion of the No-Action Alternative and existing conditions).

As described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, under the No-Action Alternative, Reclamation would continue to release a base flow from Friant Dam to meet the existing holding contract obligations to maintain a 5-cubic-foot-per-second (cfs) flow

at Gravelly Ford. Nonflood releases from Friant Dam typically range from 180 cfs to 250 cfs in summer and 40 cfs to 100 cfs in winter. Average simulated end-of month storage in Millerton Lake and the average, simulated, daily San Joaquin River flows under the No-Action Alternative are shown in Figures 2-1 through 2-6 of the Final EA/IS for the WY 2010 Interim Flows Project. These simulations have not changed for the No-Action Alternative in this Supplemental EA.

2.2 Proposed Action

The release of Interim Flows during WY 2012 would be made according to the Settlement and the Act, as limited by downstream channel capacities and potential material adverse impacts from groundwater seepage, and consistent with Federal, State, and local laws, and any agreements with downstream agencies, entities, and landowners. Interim Flows would be released to the San Joaquin River from Friant Dam during WY 2012, from October 1, 2011 through September 30, 2012. The temporal and longitudinal magnitude and timing of flow releases will be in accordance with Exhibit B of the Settlement and based on recommendations from the Restoration Administrator (RA). Recapture and recirculation of Interim Flows will occur to the maximum extent possible within the constraints of the Settlement and existing regulations and requirements. The Proposed Action is described in more detail below.

2.2.1 Interim Flow Releases Under the Proposed Action

Daily Interim Flow releases from Friant Dam would be based on the Restoration Year type (water year type per Exhibit B) and associated flow schedule per Exhibit B and other applicable Settlement provisions including recommendations by the RA. An example Exhibit B Interim Flow schedule for the wet water year type is provided in Table 2-1, and an example change in estimated maximum flows in a wet water year is provided in Table 2-2. These tables include water that would be released for water rights purposes and other deliveries, in combination with implementation of the WY 2012 Interim Flows.

Table 2-1.
Example Estimated Regulated Nonflood Flows from Friant Dam Under the Proposed Action in a Wet Year¹

Begin Date	End Date	Estimated Flows Consisting of Interim Flows and Water Right Flows at Locations in the Restoration Area (cubic feet per second)									
		Head of Reach 1 ₂	Head of Reach 2A ₃	Head of Reach 2B ₄	Head of Reach 3 ₅	Head of Reach 4A	In Reach 4B1 ₆	In Reach 4B2	In Bypass System ₇	Head of Reach 5	Merced River Confluences ₈
10/1/2011	10/31/2011	350	195	115	715	115	0	115	115	115	415
11/1/2011	11/6/2011	700	575	475	1,075	475	0	475	475	475	775
11/7/2011	11/10/2011	700	575	475	1,075	475	0	475	475	475	775
11/11/2011	12/01/2011	350	235	155	755	155	0	155	155	155	555
12/02/2011	1/31/2012	350	235	155	755	155	0	155	155	155	155
2/1/2012	2/28/2012	350	255	175	775	175	0	175	175	175	675
3/1/2012	3/15/2012	500	375	285	885	285	0	285	285	285	785
3/16/2012	3/31/2012	1,500	1,375	1,225	1,300	1,225	0	1,225	1,225	1,225	1,700
4/1/2012	4/15/2012	1,620	1,475	1,300	1,300	1,300	0	1,300	1,300	1,300	1,700
4/16/2012	4/30/2012	1,620	1,475	1,300	1,300	1,300	0	1,300	1,300	1,300	1,700
5/1/2012	6/30/2012	1,660 ⁹	1,475	1,300	1,300	1,300	0	1,300	1,300	1,300	1,700
7/1/2012	8/31/2012	350	125	45	645	45	0	45	45	45	320
9/1/2012	9/30/2012	350	145	65	665	65	0	65	65	65	340

Notes:

¹ Example only. Actual Interim Flows may vary depending on a variety of factors. Flows may be lower under other water year types.

² Assumes up to 230 cubic feet per second diverted by instream water right holders (e.g., holding contracts), consistent with Exhibit B of the Settlement.

³ Assumes up to 200 cubic feet per second lost through infiltration, consistent with Exhibit B of the Settlement.

⁴ Estimated Water Year 2012 Interim Flows at the head of Reach 2B account for seepage losses experienced in Reach 2A, consistent with Exhibit B of the Settlement.

⁵ Assumes up to 600 cubic feet per second released to Reach 3 from the Mendota Pool for diversions at Sack Dam into the Arroyo Canal.

⁶ The Proposed Action does not include any activity in Reach 4B1.

⁷ Includes Eastside and Mariposa bypasses.

⁸ Assumes accretions from Mud and Salt sloughs in Reach 5, consistent with Exhibit B of the Settlement.

⁹ May-June flow would include a block of water for shaping for testing riparian recruitment recession flow.

Table 2-2.
Example Change in Estimated Regulated Nonflood Flows Under the Proposed Action from
No-Action Alternative in Wet Years¹

Begin Date	End Date	Change in Estimated Flows Under the Proposed Action at Locations in the Restoration Area (cubic feet per second)									
		Head of Reach 1 ₂	Head of Reach 2A ₃	Head of Reach 2B ₄	Head of Reach 3 ₅	Head of Reach 4A	In Reach 4B1 ₆	In Reach 4B2	In Bypass System ₇	Head of Reach 5	Merced River Confluence ₈
10/1/2011	10/31/2011	190	190	115	115	115	0	115	115	115	115
11/1/2011	11/6/2011	570	570	475	475	475	0	475	475	475	475
11/7/2011	11/10/2011	570	570	475	475	475	0	475	475	475	475
11/11/2011	12/01/2011	230	230	155	155	155	0	155	155	155	155
12/02/2011	1/31/2012	230	230	155	155	155	0	155	155	155	155
2/1/2012	2/28/2012	250	250	175	175	175	0	175	175	175	175
3/1/2012	3/15/2012	370	370	285	285	285	0	285	285	285	285
3/16/2012	3/31/2012	1,370	1,370	1,225	700	1,225	0	1,225	1,225	1,225	1,225
4/1/2012	4/15/2012	1,470	1,470	1,300	700	1,300	0	1,300	1,300	1,300	1,300
4/16/2012	4/30/2012	1,470	1,470	1,300	700	1,300	0	1,300	1,300	1,300	1,300
5/1/2012	6/30/2012	1,470 ⁹	1,470	1,300	700	1,300	0	1,300	1,300	1,300	1,300
7/1/2012	8/31/2012	120	120	45	45	45	0	45	45	45	45
9/1/2012	9/30/2012	140	140	65	65	65	0	65	65	65	65

Notes:

- ¹ Example schedule only. Actual Interim Flows may vary depending on a variety of factors. Flows may be lower under other water year types.
² Assumes up to 230 cubic feet per second diverted by instream water right holders (e.g., holding contracts), consistent with Exhibit B of the Settlement.
³ Assumes up to 200 cubic feet per second lost through infiltration, consistent with Exhibit B of the Settlement.
⁴ Estimated Water Year 2012 Interim Flows at the head of Reach 2B account for seepage losses experienced in Reach 2A, consistent with Exhibit B of the Settlement.
⁵ Assumes up to 600 cubic feet per second released to Reach 3 from the Mendota Pool for diversions at Sack Dam into the Arroyo Canal.
⁶ The Proposed Action does not include any activity in Reach 4B1.
⁷ Includes Eastside and Mariposa bypasses.
⁸ Assumes accretions from Mud and Salt sloughs in Reach 5, consistent with Exhibit B of the Settlement.
⁹ May-June flow would include a block of water for shaping for testing riparian recruitment recession flow.

1 The actual daily WY 2012 Interim Flow releases (the resulting hydrograph) would be
2 subject to the application of flexible flow provisions described in Exhibit B and other
3 ramping and flow scheduling changes, as recommended by the RA. WY 2012 Interim
4 Flow releases would be ramped up slowly over time with flows held at constant levels to
5 allow surface water and groundwater conditions to stabilize before the next increase. As
6 described in Paragraph 15 of the Settlement, the RA, along with a technical advisory
7 committee, makes recommendations to the Secretary to help meet the Restoration Goal.
8 The WY 2012 Interim Flows ramping rate and stable flow durations may depend on RA
9 recommendations and real-time flow management decisions, as adopted by the Secretary,
10 and based on monitoring information (see Appendix C of this Supplemental EA). The
11 WY 2012 ramping rate and stable flow durations may depend on RA recommendations
12 and real-time flow management decisions based on the monitoring information and to
13 avoid impacts. Maximum Interim Flow releases from Friant Dam in a wet water year,
14 with consideration of the Settlement's flexible flow periods that would occur under the
15 Proposed Action are shown in Table 2-3.

16
17 If WY 2012 is determined to be a wet year, Interim Flows would be ramped down over a
18 60-90 day period to collect data on the establishment of riparian vegetation at appropriate
19 elevations in the San Joaquin River channel. The precise timing and magnitude of the
20 riparian recruitment release shall be based on monitoring of meteorological conditions,
21 channel conveyance capacity, salmonid distribution (if applicable for WY 2012), and
22 other physical/ecological factors with the primary goal to understand relevant factors for
23 the establishment of native riparian vegetation while working within the constraints of the
24 flood control system. The total volume of Interim Flows used for riparian recruitment
25 during WY 2012 shall not exceed the total volume of Interim Flows allocated for that
26 year.
27

1
2
3

Table 2-3.
Maximum Interim Flow Release from Friant Dam Under the Proposed Action

Start Date	End Date	Maximum Interim Flow Release from Friant Dam Under the Proposed Action (cfs)¹
Oct. 1, 2011	Oct. 31, 2011	575
Nov. 1, 2011	Nov. 10, 2011	575
Nov. 11, 2011	Dec. 1, 2011	575
Dec. 2, 2011	Jan. 31, 2012	235
Feb. 1, 2012	Feb. 15, 2012	375
Feb. 16, 2012	Feb. 28, 2012	1,375
Mar. 1, 2012	Mar. 15, 2012	1,475
Mar. 16, 2012	Mar. 31, 2012	1,475
Apr. 1, 2012	Apr. 15, 2012	1,475
Apr. 16, 2012	Apr. 30, 2012	1,475
May. 1, 2012	May. 31, 2012	1,475
Jun. 1, 2012	Jun. 30, 2012	1,475
Jul. 1, 2012	Jul. 31, 2012	1,475
Aug. 1, 2012	Aug. 31, 2012	125
Sep. 1, 2012	Sep. 30, 2012	145
1. Includes 5 cfs of riparian releases. Includes both the fall and spring flexible flow periods as described in Exhibit B of the Settlement. Actual releases may be less. Total Interim Flows volume released from Friant Dam will not exceed 389,355 acre-feet in a wet year. WY 2012 may include a small pulse flow of up to 2,000 cfs release from Friant Dam for a 12-hour period. May-June flow would include a block of water for shaping for testing riparian recruitment recession flow.		

Additional factors considered during implementation of the release of WY 2012 Interim Flows include water supply demand; Mendota Dam operations; Sack Dam operations; any agreements with landowners or other Federal, State, and local agencies; impacts to special-status species; potential for seepage; levee stability; and real time management strategies.

2.2.2 Recapture and Recirculation

The Proposed Action includes potentially recapturing¹ WY 2012 Interim Flows, to the maximum extent possible, at locations along the San Joaquin River and/or in the Delta, consistent with and limited by existing operating criteria, prevailing and relevant laws, regulations, BO, and court orders in place at the time the water is recaptured. All references to increases in exports at the Jones Pumping Plant and Banks Pumping Plant as a result of the Project would fall within the allowable pumping criteria of the 2009 NMFS Operations BO and the 2008 USFWS' Operations BO in place at the time of pumping.

Under the Proposed Action, the water released under WY 2012 Interim Flows that is available for recapture and recirculation² is estimated to equal to the amount of water that reaches the Mendota Pool at the downstream end of Reach 2B (e.g., the first location where water can be recaptured and recirculated). Flows that reach the Mendota Pool are not the same as those that reach the head of Reach 2B due to channel losses in Reach 2A. Therefore, the overall quantity of water available for recapture and recirculation is somewhat lower due to these losses. The estimated maximum water released for WY 2012 Interim Flows that could be available for recapture and recirculation under the Proposed Action is shown in Table 2-5.

The furthest downstream location where WY 2012 Interim Flows could be recaptured would be at the Jones and Banks pumping plants. The Proposed Action includes potential recapture of Interim Flows at several diversion including: facilities downstream of the Restoration Reach in the Delta, and in the San Joaquin River at the Banta-Carbona Irrigation District facility and the West Stanislaus Irrigation District facility downstream of the Stanislaus River confluence, and at the Patterson Irrigation District facility between the Tuolumne and Merced River confluences; and, facilities within the Restoration Reach including the East Bear Creek Unit of the San Luis National Wildlife Refuge (East Bear Creek Unit) in Eastside Bypass Reach 3, the Lone Tree Unit of the Merced National Wildlife Refuge (Lone Tree Unit) in Eastside Bypass Reach 2, Sack Dam at the downstream end of Reach 3, and the Mendota Pool at the downstream end of Reach 2B. WY 2012 Interim Flows recaptured along the San Joaquin River may provide deliveries in lieu of Delta-Mendota Canal (DMC) supplies. Recirculation would be subject to available capacity within CVP/SWP storage and conveyance facilities, including the Jones and Banks pumping plants, California Aqueduct, DMC, San Luis Reservoir, and related pumping facilities, and other facilities of CVP/SWP contractors.

¹ For the purposes of this document, recapture is defined as the point of redirection of Interim Flows downstream of Friant Dam.

² For the purposes of this document, recirculation is defined as the conveyance of recaptured water to the Friant Division long-term water contractors.

1 Available capacity is the capacity that is available after satisfaction of all statutory and
2 contractual obligations to existing water service or supply contracts, exchange contracts,
3 settlement contracts, transfers, or other agreements involving or intended to benefit
4 CVP/SWP contractors served water through CVP/SWP facilities. Under the Proposed
5 Action, recaptured water would be exchanged for a like amount of CVP water and/or
6 would be recirculated and held in storage in San Luis Reservoir. Additionally, water may
7 be directly recirculated to water service contractors as conditions and agreements allow.
8 Reclamation is working with the Friant Division long-term water contractors to prepare a
9 separate Environmental Assessment to determine possible mechanisms to either
10 exchange or deliver to the Friant Division long-term contractors recaptured water stored
11 in San Luis Reservoir or water directly delivered from diversion points along the San
12 Joaquin River.

13
14 Table 2-4 provides an overview of each recapture location including the estimated range
15 for recapture, estimated timing of recapture, and whether or not the facility is screened. It
16 is important to note that at this time, the exact recapture rates, amounts, and timing at
17 each facility are not known and would depend upon a variety of conditions, including
18 water supply demand, operations of other facilities, impacts to endangered species,
19 potential for seepage, and real time management strategies. Therefore, the estimated
20 range for recapture at each facility is from zero to either the estimated maximum amount
21 of Interim Flows during the spring pulse time at the facility or the estimated facility
22 capacity. Additionally, to maintain the most flexibility in implementing the Project in
23 order to respond to study needs and to avoid potential seepage and endangered species
24 impacts, if any should arise based on Interim Flow monitoring, the Project includes all of
25 the potential points of diversion in Table 2-4. However, not all points may be used, nor is
26 there any priority in which they would be used.

Table 2-4. Overview of the Recapture Locations under the Proposed Project

Facility	Estimated Recapture Range (cfs)^{1,2}	Estimated Recapture Timing³	Facility Screened
Facilities within the Restoration Area			
Facilities within the Mendota Pool			
Main Canal	0 – 1,300	During Interim Flows	No
Outside Canal	0 – 300	During Interim Flows	No
Columbia Canal	0 – 200	During Interim Flows	No
Helm Ditch	0 – 10	During Interim Flows	No
Firebaugh Canal Water District Canal	0 – 300	During Interim Flows	No
Arroyo Canal	0 – 800	During Interim Flows	No
Lone Tree Unit of the Merced NWR	0 – 20	During Interim Flows	No
East Bear Creek Unit of the San Luis NWR	0 – <60	During Interim Flows	No
Facilities downstream of the Restoration Area			
Patterson Irrigation District	0 – 195	During Interim Flows ⁴	No
West Stanislaus Irrigation District	0 – 262	During Interim Flows ⁵	No
Banta-Carbona Irrigation District	0 – 204	During Interim Flows	Yes
Jones Pumping Plant	0 – 1,300	During Interim Flows	Yes
Banks Pumping Plant	0 – 1,300	During Interim Flows	Yes

Note: Additional points of diversion in Reclamation's petitions to the State Board allow for routing of Interim Flows into and through the Eastside and Mariposa bypasses.

cfs cubic feet per second

1. Estimated range for recapture at each facility is from zero to either the estimated maximum amount of Interim Flows during the spring pulse time at the facility or the estimated facility capacity in the event that the spring Interim Flows at the facility are estimated to be greater than the facility capacity.
2. Assumes a Wet Year Type. All based on Background Report maximum capacity except refuges.
3. Dependent on other regulations (i.e. pumping restrictions, etc).
4. WY 2012 Interim Flows would only be diverted after the proposed fish screen is functional and operationally compliant, which is currently targeted for summer 2011.
5. WY 2012 Interim Flows would only be diverted by West Stanislaus ID with authority to take listed species under the Endangered Species Act.

2 Implementing the Proposed Action could increase flows entering the Delta from the San
3 Joaquin River. Delta export facilities would continue to operate consistent with existing
4 operating criteria, and prevailing and relevant laws, regulations, BOs, and court orders in
5 place at the time the water is recaptured. Water recirculation via the CVP/SWP facilities

1 would be possible using south-of-Delta facilities. No additional agreements would be
2 required to recapture flows in the Restoration Area. However, recirculation of recaptured
3 water to the Friant Division could require mutual agreements between Reclamation,
4 DWR, Friant Division long-term contractors, and other south-of-Delta CVP/SWP
5 contractors. Reclamation would assist in developing these agreements. As previously
6 described, recirculation would be subject to available capacity within CVP/SWP storage
7 and conveyance. Furthermore, implementation of the WY 2012 Interim Flows would
8 remain consistent with the RPAs as required by the USFWS Delta Smelt BO of the
9 Operating Criteria and Plan for the Continued Operations of the Central Valley Project
10 and State Water Project (USFWS Operations BO) (USFWS 2008) and the NMFS
11 Biological and Conference Opinion on the Long-Term Operations of the Central Valley
12 Project and State Water Project (NMFS Operations BO) (NMFS 2009), respectively or as
13 amended by court action³. Continued implementation of the RPAs would avoid jeopardy
14 of protected species, including Central Valley steelhead on the Stanislaus River and
15 Delta, and spring- and winter-run Chinook salmon, green sturgeon, and Delta smelt in the
16 Delta.

17
18 Recaptured water available for transfer to Friant Division long-term contractors would
19 range from zero to the quantity of water under Interim Flows that reaches the Mendota
20 Pool and would vary based upon the water year type. During a Critical-Low water year,
21 the quantity of water available for recapture and transfer to the Friant Division long-term
22 contractors would be zero, because there are no WY 2012 Interim Flow releases under
23 this water year type. During Wet years, the water available for recapture and transfer to
24 the Friant Division long-term contractors would range between zero and 321 thousand
25 acre-feet (TAF) (as shown in Table 2-5). Reclamation would identify actual delivery
26 reductions to Friant Division long-term contractors associated with the release of WY
27 2012 Interim Flows.

28 29 ***Screened Diversions***

30 As described in Table 2-4, the Proposed Action would potentially utilize three existing
31 screened recapture facilities downstream of the Merced River confluence. These are the
32 Banta-Carbona Irrigation District's (BCID) facility on the San Joaquin River, the CVP
33 Jones Pumping Plant, and the SWP Banks Pumping Plant. The BCID facility is
34 described in more detail below. All proposed recapture at the facilities would occur
35 within the facilities' operating criteria, including Biological Opinions in place at the time
36 of recapture and no additional take would occur beyond that already allowed. Any
37 increase in diversions at these facilities would occur within the allowable diversion rates
38 in the applicable Biological Opinion.

39
40 BCID facility on the San Joaquin River is located at River Mile 63.5, about five miles
41 north of Vernalis. The facility is the primary source of water for BCID and has been
42 operational for approximately 5 years. The BCID holds water rights at this location and
43 uses all of its pre-1914 water rights in order to irrigate lands within the district. The

³ If conditions change as challenges to the USFWS and NMFS Operations BOs move forward, Reclamation will release WY 2012 Interim Flows in compliance with the regulations and legal requirements in place at that time

1 BCID has a contract with Reclamation for 20,000 acre-feet (AF)/year of CVP water.
2 CVP water is used as a supplemental supply to the district's pre-1914 water supply for
3 agricultural purposes (Reclamation 2010). BCID's serves approximately 15,000 acres, of
4 which approximately 3,000 acres are Kasson contract land, and provides water to
5 additional acreage outside of the district for a total of 19,000 acres. BCID's annual
6 diversions from the San Joaquin River vary from 55,000 to 60,000 AF, depending on the
7 hydrologic year type. The BCID facility includes a 204 cubic feet per second (cfs) fish
8 screen facility. The facility was constructed prior to NMFS' most recent fish screen
9 design criteria. It consists of a vee-shaped screen located within the leveed canal and 18
10 panel screens installed vertically in a vee configuration with 9 panels to a side. Each
11 panel is 6 feet, 1 inch tall and 11 feet and 6 inches wide. The fish pass the screens and are
12 pumped through a Hidrostral fish pump to the fish return pipeline on the north levee. This
13 pipeline returns fish back to the river downstream of the diversion point. NMFS's
14 October 26, 2000 Biological Opinion, Proposed Fish Screen and Fish Bypass Facility at
15 the Banta-Carbona Irrigation District Canal (NMFS 2000) authorizes incidental take of
16 steelhead as a result of the operation of the BCID facility based on the percent of flow
17 diverted into the facility. The proposed recapture at this facility would change the current
18 operations in that BCID would divert some of the Project's flows at its facility in lieu of
19 deliveries via the Delta-Mendota Canal. All proposed recapture would occur within the
20 facilities operating criteria, including operations under the facilities' 2000 Biological
21 Opinion issued by NMFS. No additional take would occur beyond that currently allowed
22 at the facility.

23 24 ***Unscreened Diversions***

25 Recapturing water downstream of the Restoration Reach at the unscreened diversions
26 could increase fish entrainment risks. Both the Patterson Irrigation District and West
27 Stanislaus Irrigation District facilities are currently unscreened. With regard to the
28 Patterson Irrigation District facility, a fish screen that will meet NMFS and CDFG criteria
29 for protecting salmonids is currently being constructed and will be ready for service in
30 the summer of 2011. Recapture at Patterson Irrigation District facility would occur only
31 after the screen is operationally compliant with NMFS criteria. The West Stanislaus
32 Irrigation District facility is currently unscreened and will remain unscreened during WY
33 2012. This facility would only be used for the diversion of WY 2012 Interim Flows with
34 West Stanislaus Irrigation District's authority to take listed species under the Endangered
35 Species Act. Such authority is not being proposed for WY 2012, but may be proposed at
36 some time in the near future as a separate project. Interim Flows would not be diverted at
37 this facility until Endangered Species Act authorization is complete.

38
39 All recapture actions will be conducted in a manner consistent with Federal, State and
40 local laws, and any agreements with downstream agencies, entities, and landowners. No
41 additional steelhead take beyond that currently allowed or allowed at the time of
42 recapture, if different from current take levels would occur at these facilities.

43
44 The purpose of the Interim Flows Project is to collect relevant data concerning flows,
45 temperatures, fish needs, seepage, recirculation, recapture, and reuse. The Proposed
46 Action includes the conveyance of Interim Flows through the upper San Joaquin River

system from Friant Dam to at least the Merced River confluence. However, Reclamation recognizes that for a variety of reasons, including the need to avoid seepage and potential endangered species impacts (reaches 3, 4, 5), all or a portion of the flows may need to be recaptured before flows reach the confluence of the Merced River (i.e. Mendota Dam and Sack Dam). Although this has the potential to reduce the amount of data collected in the lower reaches (reaches 3, 4, and 5), it would not inhibit the ability to collect data in the upper reaches (reaches 1 and 2) where spawning habitat for reintroduced salmon would be present. The purpose of the Project would be fulfilled as valuable data would continue to be collected in the upper reaches.

New Melones Releases and Recaptured Interim Flows

Water recaptured under the Proposed Action would be limited to the amount of water released from Friant Dam under the Proposed Action minus losses. Water to be released from New Melones Reservoir to meet Delta water quality objectives is not part of the Proposed Action and would not be considered part of the recaptured flows.

**Table 2-5.
Estimated Maximum Water Available for Recapture and Recirculation
Under the Proposed Action**

Start Date	End Date	Example Interim Flow and Riparian Release Amount at the Head of Reach 2B (cfs)¹	Riparian Release Amount at Head of Reach 2B (cfs)	Interim Flows at Mendota Pool Available for Transfer (cfs)²
Oct. 1, 2011	Oct. 31, 2011	115	5	110
Nov. 1, 2011	Nov. 6, 2011	475	5	470
Nov. 7, 2011	Nov. 10, 2011	475	5	470
Nov. 11, 2011	Dec. 1, 2011	155	5	150
Dec. 2, 2011	Jan. 31, 2012	235	5	230
Feb. 1, 2012	Feb. 28, 2012	175	5	170
Mar. 1, 2012	Mar. 15, 2012	285	5	280
Mar. 16, 2012	Mar. 31, 2012	1,225	5	1,220
Apr. 1, 2012	Apr. 15, 2012	1,300	5	1,295
Apr. 16, 2012	Apr. 30, 2012	1,300	5	1,295
May. 1, 2012	Jun. 30, 2012	1,300	5	1,295
Jul. 1, 2012	Aug. 31, 2012	45	5	40
Sep. 1, 2012	Sep. 30, 2012	65	5	60
Total amount of Interim Flows available for Recapture and Recirculation (Acre-feet)				321,055

1. Includes 5 cfs of riparian releases that must be maintained past Gravelly Ford.

2. This does not include constraints in flow releases, which would result in a change for recapture potential, as a result of the Draft San Joaquin River Underseepage Limiting Capacity Analysis, March 2011. This table assumes the maximum available for recapture per the Settlement hydrographs in Exhibit B.

Key: cfs = cubic feet per second

TAF = thousand acre-feet

1

2 **2.2.3 Settlement Flow Schedules**

3 The quantity of water to be released from Friant Dam as WY 2012 Interim Flows under
 4 the Proposed Action is defined by the hydrologic year type classifications provided in
 5 Exhibit B, consistent with the Restoration Flow Guidelines (included in Appendix C of
 6 the Final EA/IS for the WY 2010 Interim Flows Project), and direction by Reclamation
 7 on management of Interim Flows (see Appendix C in the Draft EA for the WY 2011
 8 Interim Flows Project). The allocated annual quantity will be applied to the hydrographs
 9 in Exhibit B and reduced, as appropriate, within the limits of channel capacity (see Table
 10 2-6), anticipated infiltration losses, and diversion capacities. Reductions in flow could be
 11 made, in consideration of water supply demands, presence of special-status species,
 12 potential seepage, levee stability, and groundwater effects, along with real time
 13 management strategies as described in the Seepage Monitoring and Management Plan
 14 (Appendix G). Information related to levee underseepage is being assessed and may
 15 additionally limit flow releases (see Section 2.2.5 Additional Implementation
 16 Considerations, Draft San Joaquin River Underseepage Limiting Capacity Analysis).

17

18

19

Table 2-6.**Estimated Water Year 2012 Maximum Interim Flow Capacity by Reach**

Reach	Estimated Deliveries ¹ (cfs)	Infiltration Losses ¹ (cfs)	Maximum Flow in Reach, Including Levee Underseepage Constraints ^{2,3,4} (cfs)
1	230	0	To be updated
2A	0	200	1,060
2B	0	0	810
3 ⁵	0	0	1,900 ⁸
4A	0	0	630
4B1 ⁶	0	0	0
4B2	0	0	990
5 ⁷	0	0	1,690
Mariposa Bypass	0	0	1,300
Eastside Bypass Reach 1	0	0	600
Eastside Bypass Reach 2	0	0	600
Eastside Bypass Reach 3	0	0	600

Sources: McBain and Trush 2002; RMC 2003, 2007

Notes:

¹ Loss estimates incorporated into flow targets, as defined in Exhibit B of the Settlement. Includes infiltration losses in Reach 2, and water right diversions in Reach 1.

² Includes reduction in flows based on potential for levee underseepage based on analysis performed for Draft San Joaquin River Underseepage Limiting Capacity Analysis, March 2011. These flow constraints will be further reviewed and updated prior to the spring pulse of WY 2012 Interim Flows in April 2012, and may be higher depending on the results.

³ Nonflood conditions.

⁴ Does not include potential discontinuous local flow such as agricultural and natural drainage.

⁵ Flows in Reach 3 include both Water Year 2012 Interim Flows and irrigation delivery flows to Arroyo Canal.

⁶ The Proposed Action does not include any activity in Reach 4B1.

⁷ Includes return flows and drainage

⁸ Flow includes 1,300 cfs Interim Flow releases in reach plus 600 cfs delivery to San Luis Canal Company.
Key:
cfs = cubic foot per second

For the reasons described in the WY 2010 Final EA/IS and the Final WY 2011 Supplemental EA, Settlement provisions related to buffer flow and purchased water provisions are not being considered for WY 2012 Interim Flows, and therefore are not included in the Proposed Action.

Restoration Year Type Classification

Exhibit B of the Settlement identified water year types based on the percentages of years from 1922 through 2004 with relative inflows. The SJRRP has developed a correlation between these data and the complete range of potential unimpaired inflow to Millerton Lake, as shown in Table 2-7. The need for and continued development of the year type classification system was described in Appendix C of the Final EA/IS for the WY 2010 Interim Flows Project.

**Table 2-7.
Restoration Year Types as Defined in Exhibit B of the Settlement**

Restoration Year Type ¹	Range of Unimpaired Inflow to Millerton Lake (acre-feet per year)	Percentage of Years from 1922 Through 2004 ²
Wet	Greater than 2,500,000	20 percent
Normal-Wet	Greater than 1,450,000 to 2,500,000	30 percent
Normal-Dry	Greater than 930,000 to 1,450,000	30 percent
Dry	Greater than 670,000 to 930,000	15 percent
Critical High	400,000 up to 670,000	5 percent
Critical Low	Less than 400,000	
Notes:		
¹ A water year begins October 1 and ends September 30 of the following calendar year.		
² The water year types in Exhibit B of the Settlement were identified based on these data. The SJRRP has developed a correlation between these data and the range of unimpaired inflow to Millerton Lake, as shown in the table		

The Restoration year type for Interim Flow releases in 2011 and 2012 would be determined using information considered in making water supply allocations, including the DWR Bulletin 120 forecast (finalized in May 2009, May 2010, and May 2011). Reclamation shall make an initial water year determination on or before January 20 each year, consistent with the most current Draft Restoration Flow Guidelines (included as Appendix J). Adjustments to that declaration are made to reflect updated information on the water year, including snow survey information and inflows to Millerton Reservoir. Although the final declaration of water year type is not made until June, Reclamation has a declaration beginning in late February which it operates under. The Restoration year type is currently a wet year. Unless this year type changes as a result of changes in inflows to Millerton Lake, the Restoration year type for releases in fall 2011 would be a wet year; the Restoration year type for Interim Flows releases in 2012 would be based upon the initial water year determination made in February 2012 and finalized in June

1 2012. Releases before June 2012 would be based on information considered in making
2 water supply allocations, including the DWR Bulletin 120 forecast, as described above.

3 ***Timing and Magnitude of Restoration Flow Releases***

4 The RA may recommend additional changes in specific release schedules, such as
5 ramping rates, to smooth the transition through the hydrograph. Implementing these
6 recommended changes would be considered to the extent that they would not alter the
7 total amount of water required to be released pursuant to the applicable hydrograph;
8 would not result in additional water delivery reductions to Friant Division long-term
9 contractors; and could be accomplished consistent with channel capacity limitations,
10 measures to reduce or avoid seepage to adjacent lands, and any agreements established to
11 support implementation of the Proposed Action. Alternative release schedules considered
12 to date were described in Appendix C of the Final EA/IS for the WY 2010 Interim Flows
13 Project. The Wet year flow schedule identifies the estimated maximum effects associated
14 with WY 2010 Interim Flow releases, which is be reduced, as appropriate, by the limits
15 of channel capacity and other factors such as monitoring, to reduce or avoid seepage to
16 adjacent lands. The release schedule also is subject to change based on recommendations
17 from the RA (see Appendix C of this Supplemental EA) and changes, if any, in the water
18 year type. This methodology is applicable to the implementation of WY 2012 Interim
19 Flows and is used to determine potential impacts in this Supplemental EA.
20

San Joaquin River Restoration Program

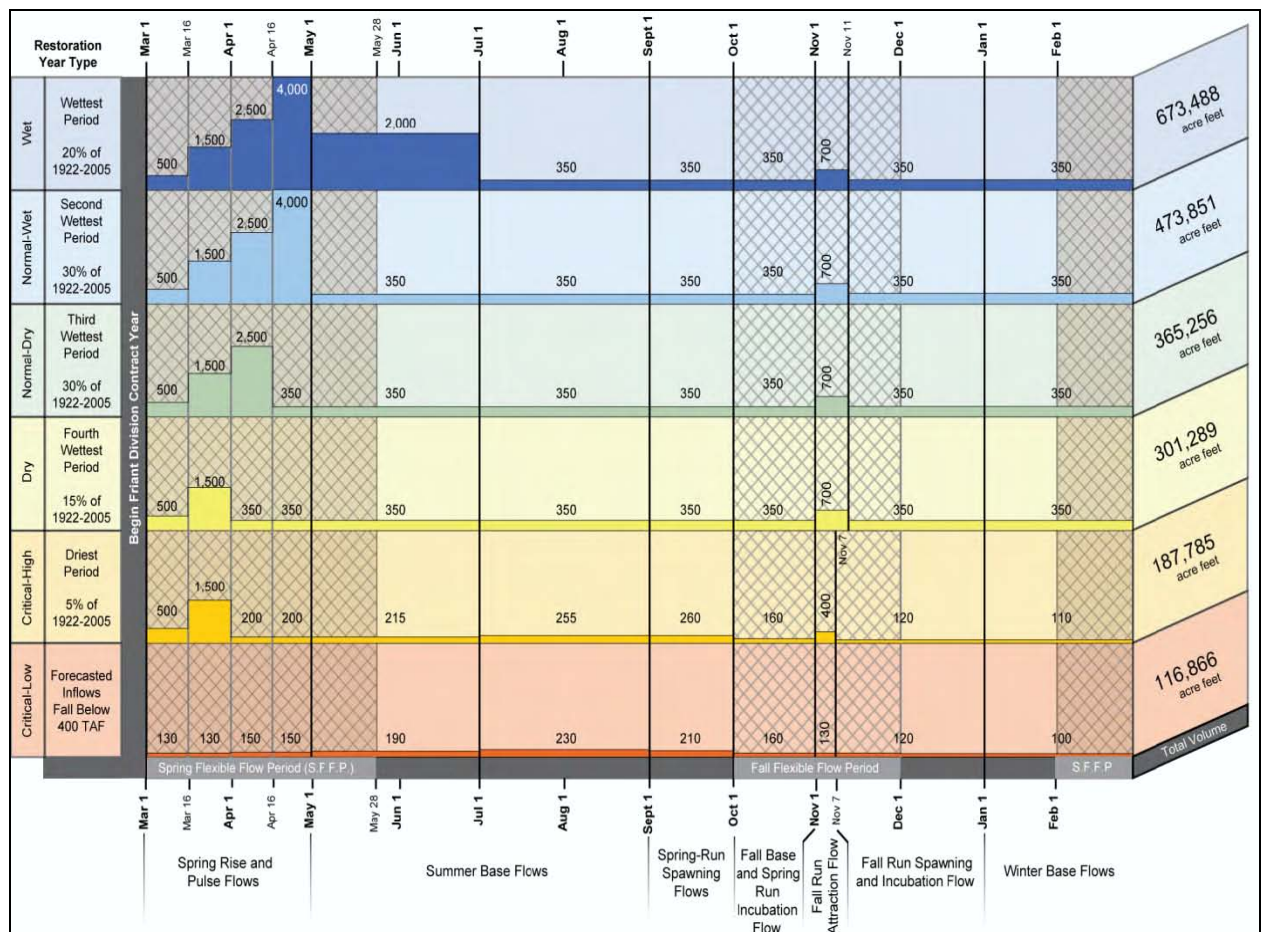


Figure 2-1.
Restoration Flow Schedules by Restoration Year-Type,
as Specified in Exhibit B of the Settlement

Flow Modifications

The Settlement defines several potential modifications to flow schedules to help achieve the Restoration Goal. These modifications include flexible flow periods, a spring pulse, buffer flows, and the acquisition and release of additional water. Because Chinook salmon will not be reintroduced to the river during WY 2012⁴, and because the purpose of WY 2012 Interim Flows is to collect relevant data, WY 2012 Interim Flows would not include applying buffer flows or releasing additional water.

WY 2012 Interim Flow releases would be less than full Restoration Flows identified in Exhibit B of the Settlement because of limited downstream channel capacities; potential material adverse effects from groundwater seepage; requirements of Federal, State, and local laws; and potential conditions in any agreements with downstream agencies, entities, and landowners. WY 2012 Interim Flows could include RA recommendations to

⁴ The Settlement schedule identifies the reintroduction of Chinook salmon by December 31, 2012. WY 2012 Interim Flows would be between October 1, 2011 and September 30, 2012, which is outside of the timing of this release target date. If Chinook salmon are scheduled to be released prior to the conclusion of WY 2012, Reclamation will coordinate with NMFS.

1 apply flexible flow periods to create additional data collection opportunities. Applying
2 flexible flow periods would be considered to the extent that they would not alter the total
3 amount of water required to be released pursuant to the applicable hydrograph, and would
4 not result in additional water delivery reductions to Friant Division long-term contractors.
5 As described in the Settlement, the RA will recommend the shape (ramping schedule and
6 maximum flows) and timing of flows subject to flood control needs, channel conveyance
7 capacity, Settlement stipulations, and permit requirements. The Proposed Action includes
8 a spring pulse consistent with the Settlement flow schedule, as constrained by existing
9 channel capacity. The spring pulse, as presented in Exhibit B of the Settlement, could be
10 scheduled within the spring flexible flow period (between February 1 and May 28, 2012),
11 and would include a release from Friant Dam of up to 2,000 cfs for a 12-hour period.
12 Total spring pulse volumes depend on the water year type; drier years have lower
13 allocated spring pulse volumes.

14
15 A report of San Joaquin River Interim Flow Unsteady Hydraulic Modeling was prepared
16 on August 25, 2009 (Appendix D of the Draft EA for the WY 2011 Interim Flows
17 Project). The primary objective of the hydraulic modeling was to identify the
18 appropriate hydrographs that would not exceed a 1,300 cfs threshold at the Chowchilla
19 Bifurcation Structure for flows of no greater than 1,300 cfs into Reach 2B. Results of the
20 hydraulic modeling indicated that all hydrographs at 2,000 cfs, 12 hours and below
21 would not exceed the 1,300-cfs threshold at the Bifurcation Structure. Therefore, a 12-
22 hour, 2,000 cfs pulse flow to test gravel mobilization in Reach 1 during the WY 2012
23 Interim Flows Project is being considered during the spring pulse period.

24 **2.2.4 Flow Considerations by Reach**

25 The Final EA/IS for the WY 2010 Interim Flows Project described the river reaches and
26 flood bypasses within the Restoration Area as a series of physically and operationally
27 distinct reaches, with channel capacity constraints, estimated gains, and estimated
28 infiltration losses. Considerations within each reach and below the Merced River
29 confluence were described in detail in Section 2.2.2 of the Final EA/IS for the WY 2010
30 Interim Flows Project.

31
32 The release of WY 2012 Interim Flows would begin on October 1, 2011 when WY 2011
33 releases should be 350 cfs. Flows would gradually and incrementally be increased about
34 350 cfs according to the Exhibit B flows schedules, with consideration of the RA
35 recommendations, and based on best-available data. The maximum release for WY 2012
36 Interim Flows in fall 2011 would be 700 cfs between November 1 and November 11 and
37 then reduced to 350 cfs. Flows would remain at 350 cfs until January 31, 2012. As
38 described in the Act, WY 2012 Interim Flows could be reduced, in consideration of
39 conditions revealed through monitoring and management actions such as those
40 incorporated in the Proposed Action operations, and as described in more detail in the
41 Seepage Monitoring and Management Plan presented in Appendix G. Beginning
42 February 1, 2012, Interim Flows would be gradually increased from releases from Friant
43 Dam. During this spring period, flows would be gradually and incrementally increased
44 based on the information collected on channel capacities and changes in the shallow
45 groundwater elevations during the fall release period and consistent with Exhibit B of the
46 Settlement, the recommendations of the RA, and best available data. The maximum

1 spring Interim Flow release for WY 2012 would be 1,660 cfs. This flow quantity would
2 be based on existing channel capacities as defined by channel conveyance, seepage, and
3 levee stability.

4
5 The release of WY 2012 Interim Flows would be managed to avoid interfering with
6 maintenance and operations of the San Joaquin River Flood Control Project. This
7 includes operations of the Chowchilla Bypass Bifurcation Structure, Sand Slough Control
8 Structure, Eastside Bypass Bifurcation Structure, and Mariposa Bypass Bifurcation
9 Structure, as well as San Joaquin River Flood Control Project levee maintenance.
10 Specifically, under the Proposed Action, no change in flood operations at the Chowchilla
11 Bypass Bifurcation Structure would occur. Releases of flood flows to the San Joaquin
12 River would be unchanged from existing operations, which are based on the estimated
13 capacity of the portion of Reach 2B below the Chowchilla Bypass Bifurcation Structure.
14 In periods when flood flows would satisfy part or all of the flow targets identified in
15 Exhibit B of the Settlement (as modified by channel capacity), WY 2012 Interim Flows
16 would not be released in addition to flood flows. Also, the release and conveyance of
17 flood flows would have a higher priority over WY 2012 Interim Flows to channel
18 capacity in all reaches. The Lower San Joaquin Levee District (LSJLD) regularly
19 conducts operation and maintenance (O&M) activities to maintain channel capacity
20 within the San Joaquin River Flood Control Project. These O&M activities would
21 continue under the Proposed Action, and could occur more frequently.

22
23 Each of the river reaches and flood bypass structures within the Restoration Area along
24 with the segments of the Project Area below the confluence with the Merced River are
25 described in detail in the Final EA/IS for the WY 2010 Interim Flows Project and are not
26 repeated in this Supplemental EA because they have not changed.

27 **2.2.5 Additional Implementation Considerations**

28 Additional implementation considerations, such as potential environmental, regulatory, or
29 legal issues, could further limit the release of WY 2012 Interim Flows and are
30 summarized below.

31 ***Draft San Joaquin River Underseepage Limiting Capacity Analysis***

32 Analysis for the SJRRP Interim Flows Project has been an informational effort to gather
33 and analyze data. As part of this learning process, analysis and data collection has been,
34 and is being performed to study flows, temperatures, fish needs, biological effects,
35 seepage, and water recirculation, recapture, and reuse opportunities. This analysis has
36 included efforts to identify seepage concerns, channel capacities, and levee stability.

37
38
39 In March 2011, the Draft San Joaquin River Underseepage Limiting Capacity Analysis
40 (Draft SJR Underseepage Analysis) was released and is available in Appendix I. This
41 evaluation looks at the potential impact of Interim Flows on underseepage and saturation
42 adjacent to levees. Underseepage occurs when water from a river moves through layers
43 of pervious material below a levee's foundation and seepage extends to both the river and
44 land-side of the levee (USACE, 2000). This seepage may result in saturation of the
45 ground surface and can lead to levee instability.

1 The results of the Draft SJR Underseepage Analysis are intended for discussion and
2 further refinement. The SJRRP Implementing Agencies are looking at the preliminary
3 results and anticipate having a final analysis complete prior to the scheduled spring pulse
4 of WY 2012 Interim Flows. This final analysis will assist in determining the maximum
5 flows to be released into reaches of the San Joaquin River in order to avoid or minimize
6 underseepage concerns. Reclamation will hold WY 2012 Interim Flow releases to the
7 flow constraints identified in the Draft SJR Underseepage Analysis (and as summarized
8 by reach in Table 2-8 below) and as identified by then-existing channel capacity. Due to
9 the limited data that is currently available for determinations of channel capacity and
10 levee stability, Reclamation would limit the release of WY 2012 Interim Flows to those
11 flows that would remain in-channel and consistent with the Draft SJR Underseepage
12 Analysis. As data is collected and further modeling is performed in reaches 2 through 5
13 of the San Joaquin River and the flood bypasses, the Draft SJR Underseepage Analysis
14 will be updated with the most current numbers in order to produce the final analysis,
15 which will be publically released. Once the Final San Joaquin River Underseepage
16 Limiting Capacity Analysis is complete, this document will be utilized to identify
17 constraints and areas of further data collection. This additional data collection will consist
18 of observations and analysis of levee stability and channel capacity as well as stream
19 gaging measurements to compare flow discharge with water surface elevation.
20

Table 2-8. Summary of Flow Capacity in Each Reach Where the Outside Ground Elevation is Within One Foot of the In-Channel Capacity Discharge⁵

Reach	Capacity Flow (cfs)
Reach 2A	1,060
Reach 2B	810
Reach 3	2,140
Reach 4A	630
Reach 4B2	990
Reach 5	1,690
Eastside Bypass	600

It is important to recognize that channel capacity constraints along the San Joaquin River vary by reach. Flows in Reaches 2A and 2B are generally limited by existing channel capacities, whereas flows in Reaches 3, 4A, 4B2, and the Eastside Bypass are most typically constrained by potential seepage to neighboring lands.

Groundwater Elevation Constraints

Groundwater elevation constraints in Reach 4A limited the release of Interim Flows past Sack Dam in WY 2011. This is based on groundwater thresholds that were established in coordination with landowners during the Seepage Conveyance and Technical Feedback meetings (see Section 2.2.6 Environmental Commitments, Seepage Monitoring and Management Plan for further information). During fall WY 2011 Interim Flows, releases past Sack Dam were held at 80 cfs and then subsequently reduced to 50 cfs to address downstream seepage concerns from neighboring landowners. Starting on February 1, 2011, flows were commenced again for the spring Interim Flow releases and were held to no greater than 50 cfs past Sack Dam. Starting on March 21, 2011, flood flows commenced and WY 2011 Interim Flows will not resume again until flood flows cease. For the implementation of WY 2012 Interim Flows, it is possible that flows past Sack Dam would again be constrained by potential seepage concerns from neighboring landowners and that flows may again be limited to reduce or avoid groundwater impacts as a result of the release of Interim Flows.

Mendota Dam and Pool Maintenance

During WY 2012, Central California Irrigation District (CCID) is scheduled to perform routine maintenance on the Mendota Pool and Dam. This will include the need to drain Mendota Pool for routine inspection and potential maintenance of the dam. Mendota Pool is typically drained every other year, from mid-November to mid-January for regular maintenance activities. In order to accommodate this activity, Reclamation would make real-time flow adjustments as necessary to allow the work to proceed. This would involve reducing or stopping Interim Flow releases from Friant Dam upon notification of the start of work by CCID. Interim Flows would resume when the work is complete.

⁵ In-channel capacity discharge consists of flows that maintain a water surface elevation at or below the elevation of the landside levee toe (i.e., the base of the levee).

1 **Arroyo Canal Fish Screen and Sack Dam Fish Passage Project**

2 The Arroyo Canal Fish Screen and Sack Dam Fish Passage Project (Arroyo Canal/Sack
3 Dam) may require real-time adjustments in flow to accommodate potential construction
4 in the summer or fall of 2012. This project would involve the installation of a fish screen
5 at the Arroyo Canal intake to minimize the risk of fish entrainment and would also
6 involve the construction of a fish ladder or fish bypass at Sack Dam, which would
7 involve modifications or replacement of the dam. This project may require reductions in
8 WY 2012 Interim Flows at Friant Dam or recapture at Mendota Pool or points upstream
9 of the Arroyo Canal/Sack Dam Project area in order to allow construction activities to
10 occur.

11 **Flood Bypass and Structure Maintenance**

12 Routine maintenance activities, such as vegetation removal, sand removal, levee
13 reinforcement and other activities may occur in WY 2012. Work by the Lower San
14 Joaquin Levee District (LSJLD) that is associated with the Eastside, Mariposa, or
15 Chowchilla Bypasses and associated structures may warrant the reduction or redirection
16 of flows either through lessened Interim Flow releases at Friant Dam or through recapture
17 opportunities at Mendota Pool. Interim Flows activities will be coordinated with LSJLD
18 when needed for flood bypass and associated structure maintenance.

19 **Implementation Coordination**

20 Implementing the WY 2012 Interim Flows would require coordination with Federal,
21 State, and/or local agencies, as well as landowners, for the release and conveyance of
22 flows through some reaches of the San Joaquin River and bypass system, and/or the
23 potential diversion of flows. WY 2012 Interim Flows would be constrained by any
24 agreements in place at the time of release. Reclamation has initiated discussions with
25 numerous entities that would be involved, through coordination, in implementing the
26 Proposed Action. Anticipated coordination to be accomplished as part of the Proposed
27 Action would be the same as described in the Final EA/IS for the WY 2010 Interim
28 Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows
29 Project.

30 **Fish Species Coordination**

31 Informal consultations on fish species with USFWS and National Marine Fisheries
32 Service (NMFS) are ongoing to comply with the Federal Endangered Species Act (ESA)
33 and Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA). The
34 ESA listed species include winter- and spring-run Chinook salmon, delta smelt, green
35 sturgeon, and Central Valley steelhead. Species subject to consultation per the
36 MSFCMA include starry flounder and all four races of Chinook salmon. Implementation
37 of the Proposed Action could increase Delta inflow as much as 1,300 cfs and increase
38 Delta exports, when such conditions comply with existing operating Criteria, consistent
39 with prevailing and relevant laws, regulations, BOs, and Court orders in force at the time
40 the water is recaptured. Recapture of WY 2012 Interim Flows at the Jones and Banks
41 pumping plants would be subject to existing or future regulatory requirements and would
42 comply with then-current NMFS and USFWS BOs or any applicable court order.

Reclamation will coordinate with NMFS and USFWS to ensure that potential adverse effects on listed species will be avoided or minimized. This will be accomplished by continually providing and discussing streamflow, recapture operations, and water quality data summaries. During periods when WY 2012 Interim Flows pass the confluence of the Merced River, specific streamflow and water quality measurements that will be addressed include DO, water temperature, pH, turbidity, streamflow, and specific conductivity at locations on the San Joaquin River just upstream and downstream from the confluence with the Merced River and in the Merced River. Monitoring results for additional constituents, including selenium, ammonia, and boron, will be available every 2 to 4 weeks and will be reviewed when available. Sources of these data are identified in the Draft Monitoring Plan for Physical Parameters Technical Memorandum (TM) (SJRRP 2008a), Surface Water Ambient Monitoring Program (SWAMP), and the Interim Flow Release Program Water Quality Monitoring Plan (Appendix E) that were described in the Final EA/IS for the WY 2010 Interim Flows Project, and the Grassland Bypass Project as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project.

In the event that WY 2012 Interim Flows cause effects that are greater than anticipated and in consultation with the fishery agencies, Reclamation will work with the agencies to modify WY 2012 Interim Flow releases as needed to avoid or minimize effects. Possible modifications include reducing flow releases, upstream diversions of flows to avoid downstream effects, or constraining flows to the upper San Joaquin River (upstream of the confluence with the Merced River). This coordination between the agencies and Reclamation's commitment to modify flows based on real time conditions would ensure that the effects of the WY 2012 Interim Flows would remain at levels that may affect but are not likely adversely affect listed species.

2.2.6 Environmental Commitments

Environmental commitments are measures or practices adopted by a project proponent to reduce or avoid adverse effects that could result from project operations. The following sections describe the environmental commitments that would be conducted in coordination with WY 2012 Interim Flows implementation to avoid any potentially adverse environmental consequences.

Vehicular Traffic Detour Plan

As described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project convenient and parallel vehicular traffic detours would be provided for public routes that would be closed because of inundation by WY 2012 Interim Flows. A detour plan has been prepared and approved by Fresno and Madera Counties and is in the final stages of approval for Merced County for the placement of detour signage. Detour signage and appropriate plans are targeted for implementation in 2011.

Recreation Outreach Program

The Recreation Outreach Program implemented for the WY 2010 and 2011 Interim Flows would continue during implementation of the Proposed Action, beginning in summer 2011 and extending through the WY 2012 Interim Flows period, ending in

1 September 2012. The purpose of the recreation outreach program would be to inform
2 recreating public, as well as agencies and organizations that serve the recreating public,
3 of changes in river flows that would occur as a result of the Proposed Action, and of the
4 potential effects associated with those changes, including recreational boating,
5 swimming/wading, fishing, and hunting hazards. The program also informs the public of
6 similar alternative river boating and fishing opportunities in the area, such as those
7 available on the lower Kings River below Pine Flat Lake and alternative
8 swimming/wading opportunities, such as those available at Millerton Lake.

9
10 The Recreation Outreach Program employs a variety of methods and media to share
11 information with the recreating public, such as messages posted on the SJRRP Web site
12 and Web sites of agencies and organizations providing recreation access, facilities, and
13 services in Reach 1; signage at public and private access points and facilities in Reach 1;
14 and verbal messages delivered as part of regular recreation programs offered by agencies
15 and organizations, such as the Public Canoe Program conducted by the San Joaquin River
16 Parkway and Conservation Trust.

17
18 Outreach targets both English-speaking and non-English-speaking residents. Additional
19 measures, such as roving contacts and other methods that agencies may suggest, could be
20 used to target audiences that may not be reached by other means, such as young adults
21 and those recreating on the river in undeveloped areas. Central to the Recreation
22 Outreach Program is coordination with agencies and organizations that provide recreation
23 access, facilities, and services in Reach 1, where most recreation in the Restoration Area
24 takes place. Specifically, this includes coordinating with the following public and
25 nonprofit agencies and organizations: the San Joaquin River Parkway and Conservation
26 Trust; San Joaquin River Conservancy; Fresno County; City of Fresno Parks, After
27 School, Recreation and Community Services Department; and CDFG. Coordination
28 would also include private entities that provide public recreation access and facilities at a
29 few locations in Reach 1.

30 ***Seepage Monitoring and Management Plan***

31 The Seepage Monitoring and Management Plan (Appendix G) describes the monitoring
32 and management guidelines included in the Final EA/IS for the WY 2010 Interim Flows
33 Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows
34 Project which also apply to the Proposed Action, as related to groundwater or levee
35 seepage. Some portions of the Restoration Area have historically experienced
36 groundwater seepage to adjacent lands associated with elevated flows. Groundwater
37 seepage has the potential to cause water logging of crops and salt mobilization in the crop
38 root zone. Similarly, some portions of the Restoration Area have experienced levee
39 instability resulting from through-levee and under-levee seepage during periods of
40 elevated flows. The WY 2010 and WY 2011 Interim Flows Project Seepage Monitoring
41 and Management Plan included flow monitoring, groundwater elevation monitoring,
42 levee patrols, and landowner contact. Reclamation began implementation of the Seepage
43 Monitoring and Management Plan for the WY 2010 and WY 2011 Interim Flows Project,
44 and would continue implementing this plan for the WY 2012 Interim Flows.

1 Since 2007, Reclamation has actively pursued agreements to access private lands for site
2 specific data collection on geologic conditions related to seepage and other physical
3 parameters. However, some landowners have actively denied access to their property for
4 this purpose. As part of the SJRRP, monitoring wells have been, and will continue to be,
5 installed on private and public lands at several transects along the San Joaquin River in
6 the Restoration Area to identify groundwater level responses to river flows. Reclamation
7 and DWR monitor groundwater levels in installed wells. Groundwater levels observed in
8 these and other wells monitored by Reclamation, DWR, and local districts would be used
9 in determining when to reduce flow releases from Friant Dam, as required by the Act.
10 Following installation of each monitoring well, groundwater elevations thresholds have
11 been developed in consideration of nearby land uses, known groundwater and subsurface
12 conditions, and other information available or provided by landowners. In general,
13 groundwater depth thresholds are classified in three ranges: an acceptable level at which
14 groundwater levels are not expected to affect agricultural production; a potential buffer
15 zone indicating an increased likelihood that seepage could affect agricultural production
16 without flow modification; and a threat zone representing groundwater levels that affect
17 agricultural production. The threat zone is determined based in part on the rooting depth
18 associated with any crops located near the monitoring well. The Proposed Action
19 includes flow reductions in response to groundwater levels observed in the buffer or
20 threat zones. If groundwater levels at a monitoring well exceed an identified threshold,
21 WY 2012 Interim Flows would be reduced or diverted.

22
23 During WY 2011, Reclamation convened a group of landowners and water users to create
24 the Seepage Conveyance and Technical Feedback Group (SCTFG). The SCTFG meets
25 monthly to discuss technical issues, monitoring results, and to provide recommendations
26 for the setting of thresholds based on land use and crop type. The information gathered
27 in this group has been used to manage real-time conditions for groundwater elevations
28 and to make required revisions to the Seepage Monitoring and Management Plan.

29
30 Existing groundwater monitoring well locations, groundwater thresholds, and recent
31 groundwater elevations at all of the wells that are part of the SJRRP's Seepage
32 Monitoring and Management Plan are provided in the SJRRP's Groundwater Atlas. The
33 Groundwater Atlas is updated periodically and posted on the SJRRP's website, which can
34 be located at <http://www.restoresjr.net/flows/Groundwater/index.html>.

35
36 Condition 9 of Corrected Order Water Right (WR) 2010-0029-DWR for the WY 2011
37 Interim Flows Project requires Reclamation to conduct a daily evaluation of groundwater
38 levels and flow and stage levels when flows are greater than 475 cfs in Reaches 2A and 3
39 and post the evaluation results to a publicly available website. In the event that
40 groundwater elevations create seepage conditions, Reclamation shall reduce or redirect
41 flows to the last known flow volume that did not result in seepage conditions until
42 Reclamation determines that increasing flows would not create seepage conditions (i.e.,
43 seepage is caused by an activity not related to Interim Flows).

44
45 During fall WY 2011 Interim Flows, releases past Sack Dam were held at 80 cfs and then
46 subsequently reduced to 50 cfs to address downstream seepage concerns from

1 neighboring landowners. Starting on February 1, 2011, flows were commenced again for
2 the spring Interim Flow releases and were held to no greater than 50 cfs past Sack Dam.
3 Starting on March 21, 2011, flood flows commenced and flow bench evaluations have
4 ceased until such time as flood flows stop. The seepage management plan uses existing
5 groundwater elevations and extrapolates stage changes to estimate future groundwater
6 depths. Prediction accuracy has generally been conservative at about 0.5 feet error.

7 ***Steelhead Monitoring Plan***

8 On February 11, 2011, the SJRRP Fisheries Management Workgroup prepared and
9 Reclamation submitted to NMFS a Plan for the Detection and Relocation of
10 *Oncorhynchus mykiss* (Central Valley steelhead) above the Merced River Confluence
11 during the SJRRP Water Year 2011 Spring Interim Flow Releases (Steelhead Monitoring
12 Plan or SMP). The Plan was prepared for the purpose of monitoring steelhead in the San
13 Joaquin River at the confluence of the Merced River between February 1 and June 1,
14 2011.

15
16 During the spring Interim Flows, releases from Friant Dam were scheduled to range from
17 a low of 350 cubic feet per second (cfs) up to 1,660 cfs, depending on the water year type
18 designation. Between February 1 and March 20, 2011, Interim Flows were held at or
19 below 50 cfs below Sack Dam due to groundwater elevation constraints in Reach 4. This
20 did not result in hydrologic connectivity of the upper reaches of the San Joaquin River
21 above the Merced River with the lower reaches below the Merced River. Because there
22 was no connectivity from the release of Interim Flows, the risk of straying of steelhead
23 did not exist and the Plan was not implemented.

24
25 Reclamation began releasing flood flows from Friant Dam into the San Joaquin River on
26 March 21, 2011. These flood flows have continued to date and are expected to continue
27 through the implementation period of the Plan. The Plan applies to Interim Flows and is
28 not implemented in flood flow conditions. Reclamation will monitor conditions in the
29 future, as flood flows are reduced, and determined in coordination with NMFS if the Plan
30 should be implemented at that time. Reclamation will continue to utilize and adapt the
31 SMP to current conditions and will implement the plan between mid-December 2012 and
32 June 2012, and in coordination with NMFS.

33 ***2009-2013 Interim Flow Release Program, Water Quality Monitoring Plan***

34 The SJRRP's Interagency Streamflow and Water Quality Monitoring Subgroup prepared
35 the Interim Flow Release Program, Monitoring Plan (Monitoring Plan)⁶ to monitor water
36 quality changes that may occur. The primary objective of the Monitoring Plan is to obtain
37 high quality data to support the SJRRP. Data collection and analysis would provide a
38 broad range of uses including, but not limited to, fisheries. Fisheries resources in the area
39 associated with existing native species and proposed reintroduction of Chinook salmon
40 stand to benefit from the knowledge of general trends in water quality, flow and
41 temperature. The Monitoring Plan describes monitoring activities including real-time,
42 grab, and composite sampling using autosamplers that will make measurements of

⁶ As described in the Settlement, Interim Flows may occur through 2013 and, thus, the Water Quality Monitoring Plan was prepared to address the entire Interim Flows timeframe.
Interim Flows Project - Water Year 2012
Final Supplemental Environmental Assessment

1 physical conditions including flow, depth, temperature, specific conductance (salinity),
2 pH, DO, turbidity, and chlorophyll.

3
4 **Real Time Management.** Real time management allows the SJRRP to adapt to the
5 uncertainty associated with Chinook salmon and native fish population restoration by
6 adjusting to new information and taking advantage of a variety of strategies and
7 techniques that are adjusted, refined, and/or modified based on an improved
8 understanding of system dynamics. Results of the monitoring and evaluation will be used
9 to redefine problems, reexamine goals, and/or refine conceptual and quantitative models,
10 to ensure efficient learning and adaptation of management techniques. Table 2-9 shows
11 the real-time water quality monitoring physical parameters.

12
13 The sampling frequency and analytical parameters were based on the 2009, 2010, and
14 2011 Interim Flow Water Quality Monitoring and recommendations from the SJRRP
15 Streamflow and Water Quality Monitoring Subgroup, which consists of the Regional
16 Board, California Department of Fish and Game, DWR, U.S. Environmental Protection
17 Agency (USEPA), and NMFS.

1
2
3

**Table 2-9.
Real-Time Monitoring Physical Parameters**

Temperature	
Method	Digital thermometer (YSI 6600 sonde)
Range	-5 to +45°C
Resolution	0.01°C
Accuracy	± 0.15°C
Salinity – Specific Conductance	
Method	Conductivity meter (YSI 6600 sonde)
Range	0 to 100 mS/cm
Resolution	0.001 to 0.1 mS/cm (range-dependent)
Accuracy	± 0.5%, ±0.1 mS/cm
Dissolved Oxygen	
Method	Digital probe (YSI 6600 sonde)
Range	0 to 50 mg/L
Resolution	0.01 mg/L
Accuracy	0 to 20 mg/L: ± 2% of reading or 0.2% mg/L 20 to 50 mg/L: ± 6% of reading
pH	
Method	Digital probe (YSI 6600 sonde)
Range	0 to 14 units
Resolution	0.01 unit
Accuracy	± 0.2% unit
Turbidity	
Method	Turbidity meter (YSI 6600 sonde)
Range	0 to 1,000 NTU
Resolution	0.1 NTU
Accuracy	± 5% of reading or 2 NTU
Depth	200 feet
Chlorophyll	
Method	Digital sensor (YSI 6600 sonde)
Range	0 to 400 µg/L
Resolution	0.1 µg/L Chlorophyll; 0.1% fluorescence
Depth	200 feet
Source: Source: SJRRP	
Key: °C = degrees Celsius; µg/L = micrograms per liter; mg/L = milligrams per liter; mS/cm = milliSiemens per centimeter; NTU = Nephelometric turbidity unit	

4
5
6
7
8

Interim Flow water will be tracked and sampled at several sites along the river as specified in the Order and for the benefit of fishery management using sensors to collect real-time measurements of physical conditions (Table 2-10).

Table 2-10.
Real Time Water Quality Monitoring Sites.

River Mile	Location	Operating Agency	CDE C	Stage	Flow	EC	Temperature	DO	Turbidity	Chlorophyll	pH
268.0	Millerton Lake	Reclamation	MIL	C	C						
267.6	San Joaquin River at Friant Dam (bottom of spillway)	Reclamation	FWQ			C	C	C	C	C	C
266.0	San Joaquin River below Friant Dam (Lost Lake Park)	USGS	SJF	C	C	C	C				
255.2	San Joaquin River at Highway 41	Reclamation	H41	C		C	C				
240.7	San Joaquin River at Donny Bridge	Reclamation	DNB	C	C	C	C				
227.6	San Joaquin River at Gravelly Ford	Reclamation	GRF	C	C	C	C	C	C	C	C
216.0	San Joaquin River below bifurcation	Reclamation	SJB	C	C	C	C	C	C	C	C
211.8	San Joaquin River at San Mateo Road	Reclamation	SJN	C	C						
202.1	San Joaquin River near Mendota (below Mendota Dam)	USGS	MEN	C	C						
181.5	San Joaquin River near Dos Palos (below Sack Dam)	DWR	SDP	C	C	C	C	C	C	C	C
168.4	San Joaquin River at top of Reach 4B	DWR	SWA	C	C	C	C	C	C	C	C
N/A – Flood Bypass	San Joaquin River below the Eastside Bypass Structure	DWR	ESB	C	C	P	P	P	P	P	P
125.1	San Joaquin River at Fremont Ford Bridge	USGS	FFB	C	C	C	C	P	P	P	P
118.3	San Joaquin River at Hills Ferry (above Merced River)	USGS	SMN	C	C	C	C	C	P	P	P
118.0	San Joaquin River near Newman (below Merced River)	USGS	NEW	C	C						
107.2	San Joaquin River near Crows Landing	USGS	SCL	C	C	C	C				
<i>Source: SJRRP</i>											
<i>Notes: C- continuous measurements; P – Proposed Location, to be installed</i>											

Mendota Pool Water Quality Response Plan

Condition 26 of Corrected Order Water Right (WR) 2010-0029-DWR for the WY 2011 Interim Flows Project requires Reclamation to implement a water quality response plan that addresses 1) the contribution of Interim Flows to high salinity conditions in the DMC, Mendota Pool, and Fresno Slough; 2) an identification of the different entities and individuals that may contribute to or play a role in the response to high salinity conditions; 3) the current legal and contractual roles and responsibilities of those entities; and 4) possible response mechanisms, including those that are under the control of Reclamation and those that are the responsibility of other entities and individuals. The Mendota Pool Water Quality Response Plan (WQRP) is included as Appendix H.

The utilization of the Firebaugh Wasteway is proposed as a possible response action in the Water Quality Response Plan for possible increased salinity conditions in the Mendota Pool that are a result of the Interim Flows. Reclamation implemented this response plan in April 2010. Water quality conditions were monitored in both the Mendota Pool and within the Firebaugh Wasteway during this response. The response plan that was implemented greatly reduced the electrical conductivity in Mendota Pool and created a dilution with water in the San Joaquin River, as indicated in Table 1, below.

Table 1: Mendota Pool Electrical Conductivity – $\mu\text{S}/\text{cm}$

Date	Delta Mendota Canal / Mendota Pool at Check 21 ($\mu\text{S}/\text{cm}$)	CCID Outside Canal Intake ($\mu\text{S}/\text{cm}$)	San Joaquin River at Mendota Dam ($\mu\text{S}/\text{cm}$)	San Joaquin River at Sack Dam ($\mu\text{S}/\text{cm}$)
4/18/2010	990	1089	238	242
4/19/2010	998	1095	296	250
4/20/2010	913	997	257	290
4/21/2010	847	925	175	251
4/22/2010	761	876	119	182
4/23/2010	470	917	86	176
4/24/2010	535	573	84	213
4/25/2010	688	255	84	326
4/26/2010	311	166	77	368
4/27/2010	215	176	76	285
4/28/2010	165	164	75	257
4/29/2010	623	572	186	316

In implementing the SJRRP, Reclamation would continue to utilize this plan in order to avoid or minimize potential water quality impacts in Mendota Pool if concerning water quality conditions appeared. The utilization of Firebaugh Wasteway would only be short-term and temporary. It would only continue until such time as salinity concentrations would decrease sufficiently as to allow Interim Flows to continue down the San Joaquin River channel to Mendota Pool recapture. Additionally, any water diverted through Firebaugh Wasteway would meet high-quality water releases from

1 Millerton Lake in the San Joaquin River channel which would dilute the Delta-Mendota
2 Canal water being temporarily routed through the wasteway.

3
4 The WQRP requires daily operations calls when electrical conductivity (EC)
5 concentrations, as measured at canal intakes, begin to reach current thresholds or when
6 total dissolved solids (TDS) levels approach 450 ppm at Check 20 of the Delta-Mendota
7 Canal (DMC), which is located just before the DMC enters Mendota Pool. Operators
8 will discuss and Reclamation will choose an appropriate action at the daily operations
9 call. Response actions to water quality in Mendota Pool may include the following:

10
11 **1) Suspend Mendota Pool Group Pump-In**

12 The Mendota Pool Pump-in EIS and the Agreement for the Mendota Pool Transfer
13 Pumping Project requires shutting down Mendota Pool Group pumps when the electrical
14 conductivity at the discharge to Mendota Pool from the DMC is 90 µmhos/cm above EC
15 measurements for 3 days. If the Mendota Pool Group wells are shut off for this reason,
16 they would not be turned back on until the EC at the canal intakes returns to a level that is
17 no more than 30 µmhos/cm above the DMC inflow. This action is the responsibility of
18 the San Joaquin River Exchange Contractors (Exchange Contractors) and the Mendota
19 Pool Group. The Exchange Contractors track salinity levels at canal intakes. Exchange
20 Contractors will notify operators at the daily operations call when salinity levels at canal
21 intakes approach this threshold. When notified by the Exchange Contractors, the
22 Mendota Pool Group will shut down pumps.

23
24 **2) Suspend DMC Pump-In**

25 The DMC Pump-in EA requires shutting off the DMC pump-in program when measured
26 water quality at Check 20 on the DMC exceeds 450 parts per million (ppm) TDS in a
27 single day. The wells may resume pumping after the average TDS is below 450 ppm for
28 3 days. This action is the responsibility of the San Luis and Delta Mendota Water
29 Authority to determine when TDS at Check 20 exceeds 450 ppm, and the responsibility
30 of Two-Year Exchange Agreement and Warren Act Contract holders to shut off pumps.

31
32 **3) Water Supplies through Firebaugh Wasteway**

33 Another response action involves supplying Exchange Contractor water deliveries
34 through Interim Flows diverted to avoid material adverse flooding or seepage impacts,
35 and supplying downstream Interim Flow targets and/or San Luis Canal Company (SLCC)
36 deliveries through the Firebaugh Wasteway. This action is the responsibility of
37 Reclamation. Following the application of the preceding response actions, as required in
38 their environmental documentation, the Exchange Contractors will notify Reclamation at
39 the daily operations call if salinity levels continue to exceed thresholds. Reclamation will
40 evaluate salinity levels and determine if a downward trend will put salinity levels below
41 thresholds within the next day. If not, Reclamation will direct SLDMWA to shut down
42 the DMC and push flows through Firebaugh Wasteway. Reclamation will specify the
43 amount of Interim Flows through Firebaugh Wasteway, and flows for SLCC through
44 Firebaugh Wasteway. Reclamation will also manual sample discharge to the San Joaquin
45 River from the Firebaugh Wasteway during this action, as needed.

- 1 Reclamation would continue to implement the Mendota Pool Water Quality Response
- 2 Plan for WY 2012.
- 3

1

2 **2.2.7 Public Draft 2010 Annual Technical Report**

3 The Public Draft 2010 Annual Technical Report presents an incremental update for
 4 monitoring and analysis results from 2010 and builds on a draft released in August 2010
 5 which reported on the first half of 2010. The ATR along with the 2011 Agency Plan are
 6 SJRRP annual reporting and planning documents. These documents play a role in
 7 development of SJRRP adaptive management, which links monitoring and analysis
 8 efforts to the decision making processes they are designed to support, forming the
 9 scientific basis for San Joaquin River operations downstream from Friant Dam. The ATR
 10 tracks long-term strategies for SJRRP implementation in problem statements and
 11 identifies information needs as uncertainties to be resolved in order to implement the
 12 Settlement. The ATR allows the Implementing Agencies to present to stakeholders the
 13 status and results of technical work to address SJRRP needs. Table 2-11 below outline
 14 the components of the SJRRP flow-related monitoring and management plan, as outline
 15 in the Spring 2010 Annual Technical Report. Reclamation will continue to work towards
 16 these objectives and report progress in yearly ATRs.

17

18

19

Table 2-11.
Components of the SJRRP Flow-Related Monitoring and Management

Component	Objectives	Monitoring Parameters	Indicators	Potential Actions	
				Immediate	Long-Term
Flow	Comply with Friant Dam releases, Settlement monitoring location flow requirements, State Water Resources Control Board (SWRCB), Division of Water Rights, Order WR 2009-0058-DWR, and identify recapture quantities	Surface water stage and flow rate	Volumes and rates of Restoration Flows at seven specified monitoring locations	Report to RA, begin negotiations for purchased water from willing sellers	Release purchased water from willing sellers and evaluate enforcement actions in case of increased diversions
Seepage	Reduce or avoid impacts from shallow groundwater due to increased river flow and stage	Groundwater elevation, visual inspection/patrol, landowner contact	Groundwater level relative to thresholds	Change releases/redirect flows through bypasses	Evaluate easements, compensate for damage, pursue engineering solutions
Channel Capacity	Identify channel capacity constraints and opportunities	Water surface elevation, landowner input, bed material composition	River stage, sand deposition, known constraints	Reduce flows, monitor, and remove obstructions and debris	Evaluate flow, removal of sediment and vegetation, and evaluate channel work
Temperature	Measure temperature from Millerton Lake to the Merced River confluence	Water temperature in Millerton Lake and at various locations along the SJR	Real-time temperature data from stream gaging stations	Continue to study temperatures and collect data	Evaluate temperature in relation to redd, juvenile, and adult fish survival

Source: Public Draft Spring 2010 Annual Technical Report

2.2.8 WY 2011 Interim Flows Monitoring

Below is a list of monitoring activities that have been, or are scheduled for WY 2011. This information will help to information WY 2012 Interim Flows and future anticipated SJRRP activities.

SJRRP Daily Seepage and Flow Bench Evaluation

Condition 9 of Corrected Order Water Right (WR) 2010-0029-DWR for the WY 2011 Interim Flows Project requires Reclamation to conduct a daily evaluation of groundwater levels and flow and stage levels when flows are greater than 475 cfs in Reaches 2A and 3 and post the evaluation results to a publicly available website. In the event that groundwater elevations create seepage conditions, Reclamation shall reduce or redirect flows to the last known flow volume that did not result in seepage conditions until Reclamation determines that increasing flows would not create seepage conditions (i.e., seepage is caused by an activity not related to Interim Flows).

During fall WY 2011 Interim Flows, releases past Sack Dam were held at 80 cfs and then subsequently reduced to 50 cfs to address downstream seepage concerns from neighboring landowners. Starting on February 1, 2011, flows were commenced again for the spring Interim Flow releases and were held to no greater than 50 cfs past Sack Dam. Starting on March 21, 2011, flood flows commenced and flow bench evaluations have ceased until such time as flood flows stop. The seepage management plan uses existing groundwater elevations and extrapolates stage changes to estimate future groundwater depths. Prediction accuracy has generally been conservative at about 0.5 feet error.

Water Quality Monitoring Results

The water quality monitoring program for the 2011 SJRRP Interim Flows includes 16 real-time monitoring stations and seven sites where water samples are measured monthly for total suspended solids, nutrients, total and dissolved carbon, bacteria, trace elements, and pesticides based on recommendations by the Regional Water Quality Control Board (RWQCB) and the SJRRP Fisheries Management Workgroup (FMWG). A wide range of constituents and parameters are monitored via grab samples and laboratory analysis. These constituents are addressed in the SJRRP Spring 2010 Annual Technical Report (March 2011).

The California Data Exchange (CDEC) electrical conductivity sensor at stream gage DM3 recorded a spike in Mendota Pool salinity due to the introduction of Sacramento-San Joaquin Delta (Delta) water from the Delta-Mendota Canal (DMC) that has higher salinity water than Friant Dam. From April 22 through 28, 2010 recaptured SJRRP flows and low irrigation demands at Mendota Pool reduced Delta deliveries. Seepage drainage water returned to the DMC resulted in EC levels that would not permit the Mendota Pool pump-in program (Figure 2-10). The water delivered to the Mendota Pool from the DMC did not thoroughly mix with low-salinity releases from Friant Dam and resulted in higher salinity water in Fresno Slough and the irrigation canal headworks, than desired by irrigators. Reclamation, the San Luis and Delta-Mendota Water Authority, and the San Joaquin River Exchange Contractors Water Authority adjusted operations to close the

DMC at Check 21, meet Arroyo Canal demands through the Firebaugh Wasteway, and dilute high salinity in Mendota Pool/Fresno Slough with low salinity San Joaquin River water. Reclamation met demands at Mendota Pool with deliveries from Friant Dam. Water quality monitoring included telemetered EC readings and grab samples.

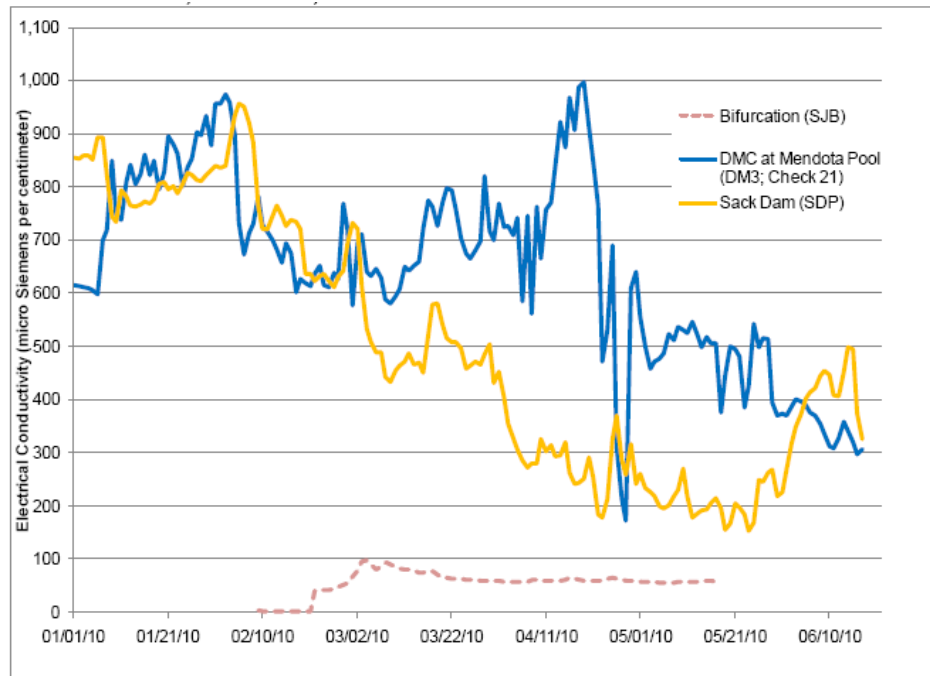


Figure 2-2. Electrical Conductivity of Surface Water at the Chowchilla Bifurcation station, Sack Dam, and the Delta Mendota Canal at Mendota Pool

The SJRRP Fisheries Management Workgroup developed the Water Quality and Fish Report as an assessment of SJRRP water quality monitoring in terms of sampling frequency, sampling locations, sampling methods, and detection levels. This review interprets water quality monitoring results for possible effects to Chinook salmon and other fish native to the San Joaquin River. Some notable findings and recommendations include:

- Bifenthrin in sediment samples at concentrations with potential to cause mortality in certain organisms and transfer up the food web via bioaccumulation.
- A total of 42 water quality samples with copper exceeding the EPA aquatic-life chronic benchmark for invertebrates, and 30 samples exceeding the acute benchmark for invertebrates.
- Storm inflow monitoring could potentially reveal toxic concentrations from surface runoff
- Tissue samples or semi-permeable membranes could help address uncertainty regarding bioaccumulation and food web transfer.
- Some laboratory detection limits are above concentrations of sub-lethal effects (parts per trillion range), which have been shown to affect growth, swimming behavior, reproduction, and immune system response in aquatic fish and invertebrates.

Reclamation and the other implementing agencies, including DFG, USFWS, and NMFS will continue to coordinate on the recommendations from the 2010 Annual Technical Report to ensure needed reporting requests are met.

Blunt-Nosed Leopard Lizard (BNLL) Reasonable and Prudent Measures

Based on conclusions issued in the September 28, 2010 concurrence and Biological Opinion (BO) from United States Fish and Wildlife Service (USFWS) for WY 2011 Interim Flows, BNLL could be adversely affected in the Eastside and Mariposa bypasses. Non-discretionary actions required of Reclamation by the BO, or reasonable and prudent measures (RPMs), include reporting updates being submitted to USFWS at appropriate intervals during project implementation, seepage monitoring, and management of invasive plant species. The RPMs recommended are abbreviated and listed below, as well as an outline of Reclamation's compliance with the BO for WY 2011 Interim Flows:

- **Reclamation shall submit a progress report every month during implementation. The updates shall detail any changes to the project footprint and BNLL habitat directly or indirectly affects by the Proposed Action, resulting in take.**

Compliance: Reclamation has weekly Streamflow, Water Quality, and Adaptive Management (SFWQ) meetings with federal and state agencies to discuss flow scheduling, real-time flow conditions, monitoring results, water quality results, and adaptation to flow conditions as needed. In these meetings, Reclamation has committed to discussing potential effects to BNLL as flows exceed 800 cfs (which was determined to be the 2011 flow baseline in the Eastside and Mariposa Bypasses where WY 2010 flows peaked). During WY 2011, fall Interim Flows, releases past Sack Dam were limited to 80 cfs. Therefore, the flows in the Eastside Bypass were minimal and did not exceed the 800 cfs threshold for BNLL. In February and March 2011, flows past Sack Dam were limited to 50 cfs past Sack Dam and flows in the Eastside Bypass did not reach the threshold for BNLL. Flood releases, which are not part of the SJRRP WY 2011 Interim Flows Project, commenced on March 21, 2011. Flood releases have ranged between 2,500 cfs and 7,500 cfs out of Friant Dam from March 2011 through the time of the preparation of this Supplemental EA. While SFWQ meetings have continued and data continues to be collected where possible, the SJRRP does not have control over flows moving through the Eastside or Mariposa Bypasses and has not reported for potential effects to BNLL since flood flows began. Reclamation takes notes at the SFWQ meetings and distributes these notes to the invitees, which includes USFWS staff. These notes are utilized for the RPM reporting requirement.

- **Reclamation shall continue to implement the Seepage Monitoring and Management Plan for WY 2010 Interim Flows, which carries forward into WY 2011.**

Compliance: Reclamation has continued to implement activities called for in the Seepage Monitoring and Management Plan, as needed, to help to reduce or avoid material seepage impacts associated with the release of Interim Flows.

1 Additionally, Reclamation has convened Seepage Conveyance Technical
2 Feedback meetings with landowners, water users, and the public. These meetings
3 discuss technical issues, seepage thresholds, and other items related to the
4 refinement of groundwater elevations associated with Interim Flow releases. The
5 Seepage Monitoring and Management Plan has been adaptively managed to
6 respond to environmental and anthropogenic variations.

- 7 • **Reclamation shall monitor, control, and manage the following invasive**
8 **species along the San Joaquin River and the flood bypass system, before and**
9 **after WY 2011 Interim Flows and as specified in the Invasive Vegetation**
10 **Monitoring and Management Plan (Appendix F of the WY 2010 Interim**
11 **Flows EA): red sesbania, salt cedar, giant reed, Chinese tallow, and sponge**
12 **plant.**

13 Compliance: Reclamation monitored invasive vegetation along the San Joaquin
14 River and the flood bypass system prior to commencing Interim Flows in WY
15 2010. This information was documented and made into an extensive GIS layer to
16 assist in assessing the extent and coverage of invasive species. Reclamation is
17 currently working on an agreement to have invasive vegetation monitored,
18 documented, and managed in the summer of 2011, during lower flows in the San
19 Joaquin River.

20 With the implementation of the above RPMs for the WY 2011 Interim Flows, USFWS
21 determined that the level of anticipated take was not likely to jeopardize the continued
22 existence of BNLL.

23 ***2011 Interim Flows Monitoring Activities and Studies***

24 A variety of data collection, monitoring activities, and studies were conducted or are
25 being conducted during the WY 2011 Interim Flows. These data collection and
26 monitoring activities will provide detailed information that will be used to validate the
27 hydraulic models and sediment transport analyses which support planning and design.
28 The data will assist the SJRRP in identifying and addressing fisheries and flow-related
29 issues that are linked to the physical processes of the river system under current and
30 future anticipated restoration conditions. The data collection and monitoring activities
31 for the WY 2011 Interim Flows are outlined in the Final 2011 Agency Plan. The list
32 below provides a general overview of these studies and monitoring:

33
34 **Real-time network monitoring of physical and water quality parameters.** Real-time
35 data sensors will continue to take real-time or incremental measurements of parameters in
36 the San Joaquin River such as temperature, dissolved oxygen, flow stage, electrical
37 conductivity, pH, turbidity, chlorophyll, organic and inorganic compounds, selenium,
38 boron, nutrients, bacteria, trace elements, total organic carbon, and other minerals.

39
40 **Water surface profile surveys.** Complete water surface profile surveys at flows up to
41 1,500 cfs in Reaches 1, 2, and 3. Survey at higher flood releases, if possible. Reaches
42 4A, 4B2, 5, and the Eastside Bypass have been surveyed previously, but need additional
43 data.

1 **Bathymetric surveys.** Reaches 4A, 4B2, 5, and the Eastside Bypass have been
2 surveyed, but additional bathymetric survey data needs to be gathered in these reaches.
3

4 **Cross sectional surveys.** Re-surveys Reaches 1A, 2A, 2B, and 3 in WY 2011 to capture
5 the before and after effects of spring and fall Interim Flows.
6

7 **Temperature monitoring for Millerton cold water pool.** Temperatures at Millerton
8 Lake's cold water pool are to be collected at the base of Friant Dam from a temperature
9 profile string and other locations within Millerton Reservoir. These temperatures will be
10 compared to instream river temperatures.
11

12 **Monitoring of spawning gravel quality and quantity.** A review of previous studies
13 will help to determine if the methods and data prepared thus far are appropriate for
14 making determinations on spawning gravel quality and quantity. This study will evaluate
15 the extent of existing habitat types, identify abundant types and which are inadequate to
16 meet the Settlement's salmonid population goals, provide detailed habitat information
17 sufficient to direct and guide restoration activities, and evaluate the effectiveness of
18 restoration actions.
19

20 **Historical and Water Year 2010 flow gage record analysis.** The study will synthesize
21 historical and WY 2010 flow gage data for each reach of the SJR to improve estimates of
22 actual losses in each reach. In addition, this study will present a discussion of
23 uncertainties in the estimated losses.
24

25 **Flow travel time from Friant Dam and tributaries to Gravelly Ford.** Using WY
26 2010 daily flow data from the Millerton Lake and Gravelly Ford stream gages, this study
27 will help to inform how Friant Dam releases and inflows from tributaries influence flows
28 at Gravelly Ford.
29

30 **Sediment and hydraulics monitoring and analysis.** This will consist of vegetation data
31 collection, hydraulic modeling, sediment data collection, bathymetric surveys, water
32 operations modeling and the development of a Sediment Management Plan.
33

34 **Lateral gradient of water table.** Utilization of the WY 2011 Interim Flows seepage
35 operations conceptual model to perform a study that updates seepage thresholds, a
36 description of conditions indicating seepage from the SJRRP, providing a procedure to
37 assess the range and extent of potential impacts from existing flows, and a description of
38 the limitations that future flows would impose.
39

40 **Terrain comparison between wells and fields.** Analysis of ground elevations, from
41 surveys and LiDAR data, will be used to determine new thresholds that account for the
42 differences between ground surface elevations at wells and in the field.
43

44 **Changes in salinity conditions resulting from Interim Flows.** This study will perform
45 soil salinity monitoring at various stages of crop planting and development and will
46 establish baseline salinity measurements in seepage-prone areas.

1
2 **Flow restrictions due to seasonal groundwater conditions.** Flow constrictions due to
3 potential seepage impacts will be identified and prioritized in order to determine solutions
4 for potential drainage issues.

5
6 **Monitoring well network optimization.** Monitoring wells will be included in an atlas
7 and will aid decisions to install more wells or decommission existing wells.

8
9 **Effects of sand mobilization on high-flow water surface elevations.** Results from this
10 study will provide information that can be used to assess channel capacity and related
11 issues in the sand bed portions of the Restoration reach.

12
13 **Sand storage in Reach 1.** This study will provide information that can be used to assess
14 the potential for fine sediment intrusion into spawning riffles in Reach 1A and the effects
15 of sand depletion on vertical stability of the sand bed portions of the Restoration reach.

16
17 **Additional water level recorders.** Up to an additional six water level recorders should
18 be installed at key locations in Reaches 1 and 2 to supplement existing stream gages. Data
19 from the recorders will be compared to routing model results and adjustments will be
20 made to the models, as necessary, to better match the data.

21
22 **Evaluation of law enforcement needs and regulatory changes to limit harvest.** A
23 Recreational Impact Study will occur which will identify existing potential sources of
24 unlawful take of fish and physical disturbance within the Restoration area. DFG will
25 draft special fishing regulations for the lower San Joaquin River, which, if passed, would
26 be in effect by the beginning of 2012.

27
28 **Spawning area bed mobility.** A study will occur that will monitor at collect data at up to
29 two riffles where modeling suggests bed mobilization would occur at flows less than
30 3,500 cfs. The results of this study will provide information on the ability to condition
31 potential spawning bed material through heightened discharge events, ability of mature
32 salmon to excavate a redd into the bed, and the quantity of suitable spawning gravel.

33
34 **Effect of scour and deposition on incubation habitat in Reach 1A.** Monitoring will
35 assess fine sediment infiltration into artificial redds. This study will aid in the
36 understanding of accumulation of fine sediment in a gravel framework of a salmon red
37 and its resultant influence on subsurface flow.

38
39 **Juvenile salmonid survival and migration.** This study will identify and characterize
40 three limiting factors for juvenile Chinook salmon survival, including predation,
41 entrainment, and physical habitat. This study will deploy telemetry receivers in Reaches
42 1 through 5, tag juvenile fall run Chinook salmon, release the salmon, and download and
43 process the resulting data.

44
45 **Floodplain inundation.** Using aerial imagery, 1D hydraulic model inundation mapping,
46 and 2D modeling for habitat mapping to estimate habitat areas for different flows prior to

1 channel improvements. The study will help fill in data gaps to aid in the quantification of
2 the amount and quality of floodplain inundation related to discharge.

3
4 **Water quality study.** This study will focus specifically on parameters that could directly
5 affect fish, including the monitoring of selenium levels, DO levels, total ammonia
6 nitrogen, and general parameters at holding pools.

7
8 **Effect of altered flow regime on channel morphology in Reach 1A.** Through the
9 deployment of scour chains at riffles and the measurement of the mobility of particles in
10 those areas, changes in pertinent channel boundary features will be made that will inform
11 future predictions.

12
13 **Temperature monitoring for adult migration.** This study will evaluate potential
14 thermal barriers and identify potential warm water sources along the San Joaquin River
15 that could affect adult migration.

16
17 **Adult passage study.** This study will evaluate lower reaches of the Restoration Area to
18 help validate draft conceptual models of stressors and limiting factors for Chinook
19 salmon to build the ecosystem diagnosis and treatment model framework.

20
21 **Hyporheic pot study.** Hyporheic pot samplers will be placed in potential spawning areas
22 agreed upon by the Fisheries Management Workgroup. These pots will assess substrate
23 characteristics, water quality, and invertebrate assemblages to better determine expected
24 value of redd environments to salmon.

25
26 **Hills Ferry Barrier evaluation.** The study to determine the efficacy of Hills Ferry
27 Barrier in preventing salmon and steelhead from straying up the San Joaquin River
28 started in the fall of 2010. Methods were under development in 2010 and will be
29 reported with the study results.

30
31 **Temperature modeling.** Using temperature data collected from DFG during Fall 2009
32 and Spring 2010 and the SJR5Q water temperature model, results will be used to
33 determine potential Interim Flows hydrographs and to be used as a scheduling tool for
34 future SJRRP actions.

35
36 **Fall-run Chinook experimental captive rearing study.** The study will test captive
37 rearing culture practices on fall-run Chinook salmon prior to working with listed spring-
38 run Chinook. Fall-run Chinook salmon efggs will be transferred to an interim facility for
39 experimental rearing where they will be reared until ready to spawn, and then spawned.
40 Fish will be monitoring and studied during their growth.

41
42 **Temperature tolerance study.** Fall-run Chinook salmon will be tested for thermal
43 tolerance in a controlled laboratory environment to evaluate gene expression under
44 different thermal regimes. This will aid in the understanding and predicting changes in
45 wild populations facing thermal stress.

Benthic macroinvertebrate SWAMP bioassessment. Reconnaissance surveys of Reaches 1 through 5 of the Restoration area will be conducted, physical habitat will be characterized and selected sampling reaches, and benthic macroinvertebrates will later be collected and analyzed. This will aid in evaluating the impact of SJRRP actions on ecological integrity and water quality conditions.

Egg survival study. This study will aid in determining salmon egg survival under current spawning conditions in the Restoration Area. This will include the construction of artificial redds to include salmon eggs and document the impacts of conditions on the survival of the eggs.

Monitor intragravel dissolved oxygen concentrations in the San Joaquin River. Continuous dissolved oxygen monitoring will be installed at a riffle location. The study will provide continuous DO data during the different flow rates of Interim Flows.

Reach 1A mechanical disturbance to enhance bed mobility. At several locations in the upper reaches of the San Joaquin River, river bed material will be disturbed mechanically to expose the finer underlying material to mobilizing flows and loosening the surface structure. This would be compared to undisturbed areas. This would provide information about bed characteristics.

Reach 1A gravel augmentation. Cross sections spanning the fine gravel layer of the streambed will be measured with a flow profiler in order to build a quantitative model of the entrainment process to assess its relevance to restoration designs. This would provide potential management alternatives for increasing the quantity of spawnable areas.

Migration cues. DSM2 modeling will be used to simulate hydrodynamics, water quality, and particle tracking in order to identify the proportion of water coming from different sources to provide a quantitative assessment of the volume of water from Friant Dam and San Joaquin tributaries to assess the Settlement flows and their influence on adult migratory cues.

Fall-Run Chinook Above Hills Ferry Barrier in Winter 2010

During the winter of 2010, California Department of Water Resources (DWR) Staff observed salmon below Sack Dam and reported the finding to DFG. DFG followed up on monitoring these fish. These fish were confirmed to be fall-run Chinook salmon that had made it past Hills Ferry Barrier. Below is a bulleted list presenting a general time frame of events related to their movement upstream and monitoring efforts:

- **November 15, 2010:** Salmon observed below Sack Dam and reported to DFG.
- **November 16, 2010:** DFG biologists confirm that the salmon are fall-run Chinook salmon. Attempts are made to trap the fish, but without success.
- **November 17, 2010:** San Luis Canal Company (SLCC) coordinates with DFG to make the fish ladder at Sack Dam operational.

- 1 • **November 18, 2010:** DFG staff confirms that there are at least 5 salmon below
2 Sack Dam and observations were made of 3 salmon moving up the ladder. One
3 female fall-run Chinook is captured, floy tagged, acoustically tagged, and fin
4 clipped for genetic sampling. This fish is released above Sack Dam.
- 5 • **November 22, 2010:** DFG tracks the tagged fish to an area directly below
6 Mendota Dam. DFG observes other salmon at the base of the dam.
- 7 • **November 23, 2020:** DFG and DWR place a trammel net at the base of Mendota
8 Dam. Two male and two female fall-run Chinook salmon are captured, floy
9 tagged, and fin clipped. One female salmon is sonic tagged. All fish are released
10 upstream of Mendota Dam.
- 11 • **November 30, 2010:** Portable acoustic receivers are deployed in Reach 1 and at
12 the Chowchilla Bifurcation Structure. No fish are detected with the receivers.
13 More salmon are observed below Mendota Dam. Electrofishing efforts are made
14 and one fall-run Chinook is captured, floy tagged, fin clipped, and released above
15 the dam. The female captured on November 18th with the acoustic tag is detected
16 in a backwater area at the base of Mendota Dam.
- 17 • **December 7, 2010:** Reclamation staff observes a fisherman catching a salmon
18 with a hook and line downstream of Mendota Dam. The salmon is acquired by
19 Reclamation staff, floy tagged, and released above Mendota Dam.
- 20 • **December 8, 2010:** A trammel net is set at the base of Mendota Dam. One male
21 fall-run Chinook is captured, floy tagged, acoustically tagged, fin clipped, and
22 placed in a 450-gallon live fish transporter. Another male Chinook, in poor
23 condition, is collected with a dip net and returned to the river. Salmon carcasses
24 are observed in a small drainage canal that runs parallel to Arroyo Canal, east of
25 Los Banos. One live male Chinook salmon is found in the canal, captured, floy
26 tagged, acoustically tagged, fin clipped, and placed in the 450 gallon live fish
27 transporter. Both salmon in the transporter are released near the base of Friant
28 Dam.
- 29 • **December 13, 2010:** DFG and DWR staff use kayaks and portable acoustic
30 receivers to track salmon in Reach 1. The male Chinook salmon that was
31 captured at the base of Mendota Dam is located approximately 5 miles
32 downstream of Friant Dam (where it had been released the prior week). The other
33 male salmon, that was found in the canal, is found as a carcass at the base of
34 Friant Dam's spillway.
- 35 • **December 14, 2010:** DFG attempts to track salmon in kayaks between Friant
36 Dam and Highway 41. No salmon are observed.

37 **2.2.9 Restoration Administrator 2011 Spring Interim Flow Program Real-** 38 **Time Management Recommendations**

39 On April 13, 2011, the RA provided draft recommendations for the WY 2011 Interim
40 Flow Program, for the spring flow period. Because WY 2011 was designated as a "wet"
41 water year type, the recommendations include potentially initiating riparian recruitment
42 flows later in the spring after the conclusion of flood releases, which would likely be after
43 May or June 2011. Further, the recommendations also focus on preparing for Chinook

1 salmon reintroduction by the end of 2012 and the commencement of full Restoration
2 Flows beginning no later than January 1, 2014. Recommended objectives for the spring
3 2011 Interim Flow releases include the following:

- 4
5 • Identifying preliminary biological management targets for water temperatures,
6 water depths, ramping rates, and seasonal floodplain inundation;
7
- 8 • Identifying real-time data needs that would be required to implement instream
9 flow management such as measuring water temperature, water surface elevations,
10 groundwater elevations, predicted meteorological conditions, reservoir inflow,
11 and reservoir water temperatures;
12
- 13 • Testing the ability of the existing reservoir water temperature, river water
14 temperature, surface water-groundwater models, flow routing models, and
15 floodplain inundation models to accurately predict the ability to manage and meet
16 downstream fish management targets over a wide range of environmental
17 conditions;
18
- 19 • Testing the ability of the existing analytical tools to provide flexibility in
20 adjusting variation in basin hydrologic conditions, to serve as the basis for
21 revising instream flow release strategies in near real-time, and to provide a
22 reliable accounting of water allocations, both in the past and near future. The
23 analytical tools must be capable of showing that the Interim Flow
24 recommendations conform with the constraints and requirements of the
25 Settlement Agreement;
26
- 27 • Identifying the lag times that occur between making changes to the instream flow
28 releases at Friant Dam and the resulting changes in conditions at various
29 downstream management locations;
30
- 31 • Determine the flexibility in managing releases on a daily and weekly time step for
32 accommodating changing environmental conditions;
33
- 34 • Determine the coordination procedures between the RA and Program
35 Implementing Agencies needed to effectively develop, implement, and monitor
36 real-time Interim Flows; and
37
- 38 • If 2011 is a wet water year type, develop a release hydrograph that likely could be
39 capable of naturally recruiting riparian vegetation on target surfaces.
40

41 The RA continues to coordinate with the Implementing Agencies and the TAC to work
42 toward the implementation of these recommendations and toward future
43 recommendations made for WY 2012

1

2 **2.3 Relationship to Related Projects**

3 ***Hills Ferry Barrier***

4 As described in the WY 2010 Final EA/IS and the Supplemental WY 2011 Final EA, the
5 Hills Ferry Barrier is a resistance weir consisting of panels aligned perpendicular to the
6 flow of the river with evenly spaced pipes that allow water, small fish, and particles to
7 pass but prevent larger fish such as adult Chinook salmon from passing upstream. The
8 barrier has been operated by DFG on the San Joaquin River since 1992. The SJRRP is
9 currently conducting an evaluation of the Hills Ferry Barrier to assess the effectiveness of
10 the barrier in blocking the upstream passage of Chinook salmon and steelhead into the
11 San Joaquin River.

12
13 The barrier is usually installed and operated from mid-September through December each
14 year. The barrier is staffed 24 hours a day to visually monitor its success, remove
15 accumulated debris and assist boaters in passing the structure. The barrier has been highly
16 effective at redirecting salmon, but is not without limitations. The barrier's effective
17 sustained flow capacity is 1,000 cfs, with the ability to withstand short-duration flows up
18 to 1,500 cfs. Flows greater than 1,750 cfs will totally submerge the barrier. Interim Flows
19 for the fall will begin October 1 and continue through December 1, 2011 with Friant Dam
20 releases ranging from 350-700 cfs. Flows at the barrier are not expected to reach 1,000
21 cfs during the typical barrier operation period in WY 2012.

22
23 The Hills Ferry Barrier has not been operated in the spring when juvenile salmon and
24 steelhead are emigrating from the downstream tributaries. The opportunity for these
25 juveniles to access the San Joaquin River upstream of the Merced River has been
26 extremely low due to inhospitable water flow and water quality conditions. However,
27 Interim Flows will likely provide conditions that could allow emigrating juvenile salmon
28 and steelhead to stray upstream of the Merced River. The need to maintain a barrier at
29 Hills Ferry during the spring is to be evaluated by CDFG as part of the SJRRP fishery
30 investigations.

31 ***San Joaquin River Tributary Flows & VAMP***

32 The Merced, Tuolumne, and Stanislaus rivers are the three main tributaries to the San
33 Joaquin River. Releases from major reservoirs on these tributaries are made in response
34 to multiple operational objectives, including flood management, downstream diversions,
35 instream fisheries flows, instream water quality flows, and releases to meet water quality
36 and flow objectives at Vernalis as part of requirements under Water Right Decision 1641
37 (D-1641) including the Vernalis Adaptive Management Program (VAMP). VAMP was
38 an experimental program to determine how salmon survival rates change in response to
39 alterations in flow releases (primarily from tributary reservoirs), and alterations in
40 CVP/SWP export levels that are based on flow conditions in the San Joaquin River at
41 Vernalis.

VAMP expired in 2010. In February 2011, the SJRGA issued a Notice of Intent to Adopt a Negative Declaration (ND) for the One-Year Extension of the SJRA in 2011. This would allow for a pulse flow for a 31-day period at Vernalis during April and May, with the exact timing determined by the San Joaquin River Technical Committee. Further, this action would identify other flows through the CVPIA water acquisition plan, with concurrence by USFWS, to facilitate migration and attraction of anadromous fish, including fall attraction flows and other flows needed by the adaptive management study. Reclamation is working with the SJRGA to implement a VAMP-like action for 2011. Although the NMFS Operations BO and RPAs state that agreements for VAMP-like conditions will be pursued, the future of VAMP is uncertain, and Reclamation and SJRA participants are discussing the future approach for a VAMP-like action beyond 2011.

No decisions on the future of a VAMP-like action have been made at the time of preparation of this EA. Reclamation is continuing negotiations for the near-term with the SJRGA. However, because of the requirements in the NMFS Operations BO and because of the reasonably foreseeable modifications proposed by the SWRCB on the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, it is reasonable to assume that a VAMP-like action would occur in the future. Reclamation would operate within all existing regulatory requirements related to future VAMP-like actions.

NMFS and USFWS Operations Biological Opinions

On December 15, 2008 the USFWS issued the USFWS Operations BO. The USFWS Operations BO concluded that the proposed CVP and SWP project operations were likely to jeopardize the continued existence of delta smelt (USFWS 2008). The USFWS developed a reasonable and prudent alternative (RPA) to: (1) reduce/prevent entrainment of delta smelt at Jones and Banks pumping plants; (2) provide adequate habitat conditions for migration and spawning in the Delta; (3) provide adequate habitat for larval and juvenile rearing; and (4) provide habitat suitable for successful recruitment of juvenile delta smelt to adulthood.

On June 4, 2009 NMFS issued the NMFS Operations BO. The 2009 NMFS Operations BO concluded that the proposed operations were likely to jeopardize the continued existence of the following:

- Sacramento River Winter-run Chinook Salmon
- Central Valley Spring-run Chinook Salmon
- Central Valley Steelhead
- Southern Distinct Population Segment of North American Green Sturgeon
- Southern Resident Killer Whales

The NMFS Operation BO stated that the SWP and CVP have “both directly altered the hydrodynamics of the Sacramento-San Joaquin River basins and have interacted with other activities affecting the Delta to create an altered environment that adversely influences salmon and green sturgeon population dynamics. The altered environment

1 includes changes in habitat formation, species composition, and water quality, among
2 others” (NMFS 2009). The opinion further concluded that the SWP/CVP operations are
3 not likely to jeopardize the continued existence of Central California Coast steelhead.
4 NMFS developed an RPA in accordance with ESA requirements. NMFS indicated that
5 based on the analyses presented in the biological opinion that the “RPA cannot and does
6 not, however, include all steps that would be necessary to achieve recovery.”
7 Consequently, NMFS included focused actions designed to compensate for a particular
8 stressor (NMFS 2009).

9
10 Reclamation provisionally accepted the USFWS and NMFS Operation BOs and
11 respective RPAs. Several urban and agricultural water suppliers have filed suit
12 challenging the BOs, which are currently pending⁷.

13
14 On March 25, 2010, NMFS issued a determination that Reclamation’s anticipated
15 operations, as shown in the figures and tables within that memorandum, were consistent
16 with specific actions of the RPA. The WY 2012 Interim Flows Project will be operated
17 to comply with applicable USFWS and NMFS Operation BO RPAs, or requirements as
18 amended by court action. The RPAs included in the USFWS and NMFS Operations BOs
19 address conditions within the Stanislaus River and downstream that affect the Central
20 Valley steelhead distinct population segment (DPS), and conditions within the Delta that
21 affect the steelhead DPS, the southern green sturgeon DPS, the winter-run and the spring-
22 run Chinook salmon ESUs, and delta smelt.

23 ***Federal Energy Regulatory Commission (FERC) ruling on Tuolumne River (Project***
24 ***No 2299-065)***

25 The 1995 *New Don Pedro Settlement Agreement* contains instream flow requirements on
26 the Tuolumne River for the anadromous fishery downstream from the project (FERC
27 2009). NMFS, USFWS, and CDFG, as well as several non-governmental organizations,
28 have sought to modify the requirements to provide flow and related conditions they
29 believe are necessary to protect threatened Central Valley steelhead and Chinook salmon
30 Essential Fish Habitat (EFH). The Federal Energy Regulatory Commission ruling could
31 result in increased flow releases from Don Pedro Reservoir that would increase flows in
32 the San Joaquin River downstream from its confluence with Tuolumne River, and thus,
33 could affect flow conditions within the San Joaquin River during WY 2012. In such an
34 event, the Reclamation would work with the fish agencies to evaluate resulting changes
35 in flows to ensure that listed species are not adversely affected by the Proposed Action.
36 The most recent flow schedule for 2010-2011 is available at
37 http://tuolumnerivertac.com/FERC%20FLows_2010_2011.pdf.
38

⁷ If conditions change as challenges to the USFWS and NMFS Operations BOs move forward, Reclamation will comply with the regulations and legal requirements in place at that time.

Specific flow conditions that are being addressed and could change as a result of a FERC decision include:

- Spawning flow – October 1 to March 31
- Attraction pulse flows - Fall
- Outmigration flows - Spring
- Oversummering flow - June 1 through September 30

The November 20,2009 Final Report of the Presiding Judge on Interim Measures recommends additional studies to determine the effects of increased stream flow releases and other modifications of operations on the viability of fall-run Chinook salmon and steelhead populations in the lower Tuolumne River.

3.0 Affected Environment and Environmental Consequences

Detailed descriptions of the physical environment and existing conditions that could be affected by the Proposed Action, as well as the environmental consequences resulting from implementation of the Proposed Action or the No-Action Alternative consistent with NEPA and CEQA Guidelines are included in Sections 3 and 4, respectively, of the Final EA/IS for the WY 2010 Interim Flows Project (Appendix A). The following sections summarize the changes to the affected environment and environmental consequences analyses considered in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project that would potentially result from implementation of the WY 2012 Interim Flows. Although this document is a Supplemental EA for the purposes of complying with NEPA, CEQA-related language and impact determinations are included in this section for consistency with the Final EA/IS for the WY 2010 and WY 2011 Interim Flows Projects and to allow direct reference and comparison between the documents.

3.1 Changes to the Affected Environment

The study area (discussed in Section 1) is broadly defined to evaluate potential environmental effects of the Proposed Action. The geographic areas where effects may occur differ according to resource category; therefore, resource-specific descriptions of the affected environment are generally prepared to support the environmental consequences analyses. For implementation of the Interim Flows Project in WY 2012, the affected environment descriptions would not vary substantially from those presented in the WY 2010 Final EA/IS. Table 3-1 summarizes the changes, if any, to the resource-specific affected environment descriptions presented in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project.

Table 3-1.
Summary of Changes to the Affected Environment and Environmental Consequences Analyses
from the WY 2010 Final EA/IS

Resource Topic	Changes to Affected Environment	Environmental Consequences Analysis
Aesthetics	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The vividness, intactness, and unity of the three geographic subareas considered in the WY 2010 Final EA/IS remains the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the WY Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to aesthetics.
Agricultural Resources	There are no changes to the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project.	Recaptured water available for transfer to Friant Division long-term contractors would range from zero to the quantity of water under Interim Flows that reaches the Mendota Pool and would vary based upon the water year type. Although recapture opportunities could be constrained during some times under certain hydrologic conditions, it is unlikely that this limitation would result in conversion of agricultural lands to non-agricultural uses. Therefore, as discussed below and for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, impacts to Agricultural Resources are less than significant.
Air Quality	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The existing air quality conditions in the area, determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing sources, considered in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project remains the same. Additionally, the ambient air quality conditions and existing sensitive receptors remain unchanged.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the continuation of the Interim Flows through WY 2012 would result in less than significant impacts to air quality.

Table 3-1. *continued*

Resource Topic	Changes to Affected Environment	Environmental Consequences Analysis
Biological Resources – Terrestrial Resources	Implementation of the Reasonable and Prudent Measures (RPMs) from the USFWS Biological Opinion issued for WY 2011 Interim Flows are being implemented. This does not substantively change the affected environment from those conditions considered in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. See Section 3.1.1 for additional details.	Environmental impacts to terrestrial species will not change. For the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action would not result in significant impacts to terrestrial resources (including listed, special-status, native, or migratory wildlife species) or their habitats. See Section 3.2.2 below for additional details and analysis.
Biological Resources – Fish	The project is the same as that assessed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, which includes all actions identified for Interim Flows in Exhibit B of the Settlement hydrographs. However, WY 2010 and WY 2011 included a time from mid-November to January 31 that would not include releases of Interim Flows. For WY 2012, a 350 cfs release would be made, consistent with channel limitations and downstream constraints, during this time frame. See Section 3.1.2 for additional details.	As Hills Ferry Barrier is removed in mid-December and VAMP or VAMP-like tributary flows begin on March 15, there may be an impact to Central Valley steelhead as a result of possible straying. This 350 cfs flow would be within hydrologic conditions previously described for 350 cfs base flows from October 1 to October 31, February 1 to February 28, and July 1 through September 30 and as analyzed for WY 2010 and 2011 Interim Flows. However, Reclamation would to implement the Steelhead Monitoring Plan from December 1 through March 15, which calls for several options, alone or in combination, to collect, transport, and document potential strays. The SMP shall be utilized to detect the presence or absence of steelhead that may enter the Restoration Area. Effects to steelhead will be addressed through the 4(d) and/or 10(a)(1)(A) permit application process with NMFS. These impacts are anticipated to be extremely minimal as historical data from the California Department of Fish and Game at the Hills Ferry Barrier for the monitoring of fish at the barrier have yet to record Central Valley Steelhead at the facility. Effects to the species in relation to the implementation of the SMP are expected to be less than significant. See Section 3.2.2 below for additional details and analysis.
Cultural Resources	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The prehistoric and historic-era archaeological sites, Traditional Cultural Properties, Sites of Religious and Cultural Significance, architectural properties (e.g., buildings, bridges, and structures), and/or historic properties (as defined by the National Historic Preservation Act) remains the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to cultural resources.

Table 3-1. *continued*

Resource Topic	Changes to Affected Environment	Environmental Consequences Analysis
Geology and Soils	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The geology and seismicity, land subsidence, and salt conditions considered by geologic provinces, physiographic regions, and other large-scale areas in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, for the same reasons as described in these documents, the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to geology and soils.
Hazards and Hazardous Materials	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The hazards and hazardous material existing conditions considered by anthropogenic hazards, West Nile virus (WNV), Valley Fever, school safety, oil and gas wells, wildland fire, and aircraft safety, remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, for the same reasons as described, the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to hazards and hazardous materials.
Hydrology and Water Quality	Additional information has been provided on flow schedules, consistent with Exhibit B of the Settlement, which includes the release of Interim Flows between November 11, 2011 and January 31, 2012. This could result in minor changes to the affected environment for Hydrology and Water Quality from the conditions considered in the WY Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. See Section 3.1.3 for additional details.	WY 2012 Interim Flows would involve 350 cfs releases from Friant Dam between November 11, 2011 and January 31, 2012. This is consistent with Exhibit B of the Settlement and would not result in new or more severe impacts than those analyzed in the Final EA/IS for the WY 2011 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. For the same reasons as discussed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action would not result in substantial alteration to hydrology and water quality conditions in the Restoration Area. Therefore, the Proposed Action would result in less than significant impacts to Hydrology and Water Quality. See Section 3.2.2 below for additional details and analysis.
Land Use and Planning	There are no changes in the affected environment from those considered in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The Land Use and Planning conditions (included with Agricultural Resources description) remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to land use and planning.

Table 3-1. *continued*

Resource Topic	Changes to Affected Environment	Environmental Consequences Analysis
Mineral Resources	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The mineral resource characteristics of the region remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, the continuation of the Interim Flows through WY 2012 would result in no impacts to mineral resources.
Noise	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The existing noise and vibration conditions in and surrounding the Restoration Area and in the San Joaquin River from Merced to the Delta remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to noise.
Population and Housing	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The population and housing trends for the three-county Restoration Area and the five-county Friant Division Water Contractors Service Areas (Friant Division Service Area) remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, the continuation of the Interim Flows through WY 2012 would result in no impacts to population and housing.

Table 3-1. *continued*

Resource Topic	Changes to Affected Environment	Environmental Consequences Analysis
Public Services	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The utilities and public service systems within the Restoration Area, including fire protection services, law enforcement services, and emergency services, as well as utilities and public service systems addressed to some degree in other resource section affected environments remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to public services.
Recreation	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The recreation facilities, activities, and opportunities remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to recreation.
Transportation/Traffic	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The transportation, traffic, and infrastructure (e.g., roadway, railroad, and utility crossings) conditions remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to transportation and traffic.
Utilities and Service Systems	There are no changes in the affected environment from those described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. The Utilities and Service Systems (included with the Public Services description) remain the same.	Implementation of the Proposed Action or the No-Action Alternative would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore the continuation of the Interim Flows through WY 2012 would result in no impacts or less than significant impacts to utilities and service systems.

3.1.1 Biological Resources – Terrestrial Resources

The Biological Opinion (BO) issued by USFWS for the WY 2011 Interim Flows Project issues forth Reasonable and Prudent Measures (RPMs) for BNLL that could occur in the Eastside and Mariposa Bypasses. Because inundation occurs seasonally and has varied in magnitude between years, BNLL could have been present in areas that would be inundated by Interim Flows in normal years. However, because the baseline conditions from WY 2011 to WY 2012 vary greatly - WY 2011 baseline conditions consisted of generally low-flow conditions and a relatively dry channel, whereas baseline conditions for WY 2012 consist of coming off the end of a large flood release of up to 7,500 cfs out of Friant Dam - then it is unlikely that individuals from existing populations outside of the levees moved into the Eastside Bypass channel this year.

3.1.2 Biological Resources – Fish

WY 2012 Interim Flows will continue from October 1, 2011 through September 30, 2012, consistent with the Exhibit B Settlement hydrographs and in coordination with downstream limitations and channel capacity constraints. This would include a 350 cfs flow release from Friant Dam from November 11, 2011 through January 31, 2012. Hills Ferry Barrier is scheduled to be removed in mid-December 2011. It is estimated that VAMP-like flows will occur in the lower San Joaquin River tributaries from March 15, 2012 through April 30, 2012. As a result, the critical timing for Central Valley steelhead in relation to possible straying in the San Joaquin River could occur between mid-December of 2011 through March 15, 2012. Reclamation will adapt the Steelhead Monitoring Plan for this timeframe and will monitor Central Valley steelhead that could make it past the Merced River confluence. This plan includes several options, including electrofishing at partial barriers and false upstream migration pathways, utilization of large fyke traps, or the use of weirs below false attraction locations and structures to detect, trap, and relocate Central Valley steelhead. Each year, the California Department of Fish and Game (DFG) obtains 4(d) permit coverage for their operations at Hills Ferry Barrier. Reclamation will coordinate with DFG for the implementation of monitoring activities. Reclamation would coordinate with NMFS prior to the implementation of the Steelhead Monitoring Plan and in the event that steelhead are detected in the Restoration Area.

3.1.3 Hydrology and Water Quality

WY 2012 Interim Flows will include flows released from Friant Dam between October 1, 2011 and September 30, 2012. This will include flows, as defined by the Exhibit B Settlement hydrographs and as constrained by downstream capacity and seepage limitations. Interim Flows releases, assuming a wet water year type, starting on October 1, 2011 will be 350 cfs and will continue until October 31, 2011. On November 1, 2011, flows will increase to 700 cfs and will last until November 10, 2011. On November 11, 2011, flows will decrease to 350 cfs and will continue through February 28, 2012. On March 1, 2012, flows will increase to 500 cfs, will increase again to 1,500 cfs on March 16, 2012, then increase again to 1,620 cfs from April 1, 2012, and reach a maximum flow of 1,660 cfs on May 1, 2012. Flows will decrease on July 1, 2012 to 350 cfs and remain at this level through September 30, 2012. These flows would be subject to flexible flow provisions and other ramping and flow schedule revisions, as recommended by the RA.

The WY 2012 ramping rate and stable flow durations will depend on RA recommendations and real-time flow management decisions based on the available monitoring information.

The flow schedule presented for WY 2012 Interim Flows is different than WY 2010 and 2011 because a 350 cfs flow from November 11 through January 31 is presented. For WY 2010 and 2011 there was no scheduled Interim Flow release for this period. The Interim Flow release during this time frame is consistent with Exhibit B of the Settlement hydrograph and would provide important additional information related to temperature, flows, sediment mobility, and water quality.

3.2 Environmental Consequences Analysis

This section presents the environmental consequences and analysis of cumulative effects potentially resulting from implementation of the Proposed Action. Because the No-Action Alternative has not changed from the conditions described in the WY 2010 Final EA/IS, the analysis of the potential impacts associated with the No-Action Alternative for each resource area remains unchanged and is not repeated here.

The following sections summarize information and findings from the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project relevant to implementation of the Proposed Action. Section 3.2.1 includes a discussion of the resource topics that would not result in any new significant effects or substantial increase in the severity of effects previously analyzed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Section 3.2.2 describes those resource topics potentially affected by new information provided here for the WY 2012 Interim Flows Project and describes any changes in significance determinations from those presented in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project.

3.2.1 Resource Topics Not Requiring Further Evaluation

The environmental consequences analyses and impact determinations for the Proposed Action from the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project were reviewed with the current/new available information described above in Section 2. Based upon this review, it was determined that the following resource topics would not result in any new or more significant effects due to implementation of a second year of Interim Flows during WY 2012.

Aesthetics

Although the Proposed Action could result in changes to the visual setting, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the continuation of the Interim Flows through WY 2012 would not have a substantial effect on a scenic vista, not substantially damage scenic resources, not substantially degrade the

existing visual character or quality of Millerton Lake, the Restoration Area, the San Joaquin River below the Merced River confluence to the Delta, or their surroundings, or create a new source of substantial light or glare. Therefore, impacts to Aesthetics are less than significant.

Air Quality

Although the Interim Flows Project emissions would not exceed SJVAPCD thresholds, ground-clearing activities using large mechanical equipment for vegetation removal could result in emissions of PM₁₀ and PM_{2.5} and, thus, these activities would be subject to SJVAPCD Regulation VIII: Fugitive PM₁₀ Prohibitions. However, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project and as adopted for this Supplemental EA, the Proposed Action includes implementing measures necessary to comply with SJVAPCD Regulation VIII: Fugitive PM₁₀ Prohibitions; therefore, project-generated operational emissions would not conflict with or obstruct implementation of an applicable air quality plan, violate an air quality standard, contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase of any criteria pollutant for which the Proposed Action region is nonattainment under an applicable Federal or State ambient air quality standard. For the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, there would be less than significant impacts to Air Quality.

Cultural Resources

Although some ground-disturbing activities and operational changes (e.g., timing and magnitude of reservoir elevation fluctuations; magnitude and duration of flows) could occur, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action would not cause a substantial adverse change in the significance of a historical or archeological resource, not directly or indirectly destroy a unique paleontological resource/site or geologic feature, or likely disturb any human remains. Therefore, impacts to Cultural Resources are less than significant.

Geology and Soils

For the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action would not involve conditions that could result in seismic activity or related ground failure or landslides. Although the Proposed Action would alter the timing and magnitude of reservoir elevation fluctuations and magnitude and duration of instream flows, for the reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, potential changes to downstream stream erosion characteristics and localized changes in downstream geomorphologic characteristics would be less than significant. Additionally, the Proposed Action would not increase the risk of landslides, lateral spreading, liquefaction, or collapse, would not increase risks to life or property due to the presence of expansive soils within the region, and would not involve temporary or

1 long-term installation or use of wastewater disposal systems. Therefore, impacts to
2 Geology and Soils are less than significant.

3 ***Hazards and Hazardous Materials***

4 Although the Proposed Action could involve application of herbicidal chemicals to
5 control and manage nonnative invasive plant species, for the same reasons as described in
6 the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final
7 Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action would
8 not create a significant hazard to the public or the environment. Therefore, Hazards and
9 Hazardous Materials impacts would be less than significant.

10 ***Land Use and Planning***

11 For the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows
12 Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows
13 Project, implementation of the Proposed Action involves release of Interim Flows, which
14 could temporarily disrupt local circulation through the inundation of local roads.
15 However, for the same reasons as described in the Final EA/IS for the WY 2010 Interim
16 Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows
17 Project and as adopted for this Supplemental EA, the Proposed Action includes
18 preparation and implementation of a detour plan. Therefore, for the same reasons as
19 described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and
20 Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action
21 would not physically divide and established community, not conflict with any applicable
22 land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an
23 environmental effect, and not conflict with any applicable habitat conservation plan or
24 natural community conservation plan. Implementation of the Proposed Action would
25 have less than significant impacts to Land Use and Planning.

26 ***Mineral Resources***

27 Implementation of the Proposed Action would not result in the loss of availability of
28 known resources that would be of value to the region or the residents of the state, and
29 would not result in the loss of availability of a locally important mineral resource
30 recovery site. Therefore, for the same reasons as described in the Final EA/IS for the
31 WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY
32 2011 Interim Flows Project, there would be no impacts to Mineral Resources.

33 ***Noise***

34 Although the Proposed Action does not involve any construction-related activities, it does
35 involve plant survey and removal activities involving some mechanical equipment.
36 However, for the same reasons as described in the Final EA/IS for the WY 2010 Interim
37 Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows
38 Project, the noise-related impacts due to these activities would be temporary in nature and
39 would not result in the exposure of persons to or generation of noise levels in excess of
40 applicable standards, exposure of persons to or generation of excessive groundborne
41 vibration or groundborne noise levels, a substantial permanent increase in ambient noise
42 levels, or a substantial temporary or periodic increase in ambient noise levels.
43 Additionally, the Proposed Action would not be located within an airport land use plan or

in the vicinity of a private airstrip where people residing or working in the project area could be exposed to excessive noise levels. Therefore, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, there would be less than significant impacts to Noise.

Population and Housing

Implementation of the Proposed Action would not directly or indirectly induce substantial population growth in an area, displace substantial numbers of existing homes or people. Therefore, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, there would be no impacts to Population and Housing.

Public Services

For the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action has the potential to increase recreational opportunities on the San Joaquin River from Friant Dam downstream to the Delta, which could result in slightly increased demand on emergency services (e.g., fire and police protection) and parks and related public facilities. However, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for the public services of fire protection, police protection, schools, parks, or other public facilities. Therefore, the Proposed Action would result in less than significant impacts on Public Services.

Recreation

Implementation of the Proposed Action has the potential to increase some recreational opportunities (e.g., boating and fishing) on the San Joaquin River from Friant Dam downstream to the Delta; however, uninformed recreationalists (e.g., boaters, swimmers, waders, anglers, and hunters) could be affected by increased spring and early summer flows in the San Joaquin River. For the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project and as adopted for this Supplemental EA, the Proposed Action includes implementation of a Recreation Outreach Program. The purpose of the Recreation Outreach Program is to inform recreating public, as well as agencies and organizations that serve the recreating public, of changes in river flows that would occur as a result of the Proposed Action, and of the potential effects associated with those changes, including recreational boating, swimming/wading, and fishing hazards. Therefore, for the same reasons as discussed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action would not result in an increase in the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated, and would not include

1 construction or expansion of recreational facilities. Impacts to Recreation would be less
2 than significant.

3 ***Transportation/Traffic***

4 Implementation of the Proposed Action has the potential to increase recreational
5 opportunities on the San Joaquin River from Friant Dam downstream to the Delta, which
6 could result in slightly increased traffic. Additionally, for the same reasons as described
7 in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final
8 Supplemental EAs for the WY 2011 Interim Flows Project, implementation of the
9 Proposed Action involves release of Interim Flows, which could temporarily disrupt local
10 circulation through the inundation of local roads. However, for the same reasons as
11 described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and
12 Final Supplemental EAs for the WY 2011 Interim Flows Project and as adopted for this
13 Supplemental EA, the Proposed Action includes preparation and implementation of a
14 detour plan. Therefore, for the same reasons as discussed in the Final EA/IS for the WY
15 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011
16 Interim Flows Project, the Proposed Action would not cause an increase in traffic which
17 is substantial in relation to the existing traffic load and capacity of the street system,
18 exceed, either individually or cumulatively, a level of service standard, result in a change
19 in air traffic patterns, substantially increase hazards due to a design feature or
20 incompatible uses, result in inadequate emergency access, result in inadequate parking, or
21 conflict with adopted policies, plans, or programs supporting alternative transportation.
22 Implementation of the Proposed Action would have less than significant impacts to
23 Transportation/Traffic.

24 ***Utilities and Service Systems***

25 Because the Proposed Action does not involve generation or treatment of wastewater or
26 solid waste, demands for related facilities would not increase. Therefore, for the same
27 reasons as discussed in the Final EA/IS for the WY 2010 Interim Flows Project and the
28 Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed
29 Action would not result in impacts to Utilities and Service Systems. Although the
30 Proposed Action would involve reoperation of Friant Dam, and therefore change the
31 distribution of water supplies (e.g., recapture and recirculation), the Proposed Action
32 would not increase demand on water supplies or require new or expanded entitlements.
33 Therefore, Utilities and Service System impacts would be less than significant.

34 **3.2.2 Resource Topics Potentially Affected by the Proposed Action**

35 The environmental consequences analyses and impact determinations from the Final
36 EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs
37 for the WY 2011 Interim Flows Project were reviewed with the current/new available
38 information described above in Section 2. Based upon review of the Final EA/IS for the
39 WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY
40 2011 Interim Flows Project, it was determined that the following resource topics could
41 potentially result in changed effects (e.g., environmental consequences) due to
42 implementation of Interim Flows during WY 2012. A discussion of the project elements
43 with the potential to result in changed environmental conditions is provided as they relate

to specific resource topics. Additionally, a discussion of the potential cumulative effects by resource topics is also included.

Biological Resources – Terrestrial Species

The BNLL is associated with alkali scrub habitat or other sparsely vegetated habitats with sandy soils. BNLLs use the burrows of small rodents for shelter, predator avoidance, and behavioral thermoregulation. They are not expected to be found in riverine or riparian habitats in the Proposed Action area, but could be found in portions of the Eastside and Mariposa bypasses.

The Eastside and Mariposa bypasses cut through upland habitats that could provide suitable habitat for BNLL. They are known to occur adjacent to the Eastside Bypass on the Merced NWR (CNDDB 2010). BNLL surveys conducted by California State University's Endangered Species Recovery Program in 2009 and by the California Department of Water Resources in 2010 during the active season for BNLL did not result in the findings of any BNLL in accessible lands within and adjacent to the Eastside and Mariposa Bypasses.

The Eastside and Mariposa bypasses are periodically inundated by flood flows, which likely reduce the suitability of habitat for BNLL within these areas. WY 2010 Interim Flows inundated comparable areas of the bypass when flows entering Reach 4 were about 700 cfs. Further, non-SJRRP flood releases up to 7,500 cfs from Friant Dam occurred in WY 2011, which included large flow releases to the Eastside and Mariposa Bypasses. If BNLL were present within these facilities before or during flood releases, it is likely the species would have migrated out of the channel or had burrows inundated by water. The flood releases were made starting on March 21, 2011 and are still continuing as of the release of this document (June 2011). Flood releases have the potential to continue into late June or July of 2011 and would take 2-3 weeks to evacuate out of the system. Another factor that may also continue to inundate the bypass channels into the summer could be tributary inflows into the San Joaquin River which may continue flows down the bypasses for a later period of time. As BNLL are typically most active between April 15 and July 15, this would have the potential to decrease the probability of their presence in the Eastside and Mariposa Bypasses for WY 2012 as the species would need to move in from another location and would not currently be present in areas of inundated potential BNLL habitat. Therefore, the potential for presence of BNLL in the Eastside Bypass for WY 2012 Interim Flows is unlikely and greatly reduced as a result of the non-discretionary release of flood flows.

Biological Resources – Fish

Implementing the WY 2012 Interim Flows Project would increase flows in the section of the San Joaquin River from Friant Dam to the Delta. Segments of the San Joaquin River upstream from the Merced River were often dry prior to WY 2010 Interim Flows. The WY 2012 Interim Flows would occur from October 1, 2011 through September 30, 2012.

Increased flows in the San Joaquin River downstream from the Merced River confluence should improve overall conditions for migrating adult and juvenile steelhead with the

1 potential to improve water quality, and provide slightly higher water velocities. Improved
2 conditions would likely reduce or prevent migration delays by both adults and juveniles.

3
4 It is not anticipated that WY 2012 Interim Flows would affect the migratory behavior of
5 steelhead. Historic streamflow conditions upstream from the Merced River confluence
6 during the spring averaged 119 cfs to 13,050 cfs, with peak flows reaching 59,000 cfs in
7 1997 under flood conditions. During nonflood conditions in WY 2012, Interim Flows
8 could increase flows by an average of up to 220 cfs at this location beginning on
9 February 1, 2012. The average annual flows under the Proposed Action are within 7
10 percent of the average flow expected at this time and location under existing conditions.
11 This small increase is not anticipated to trigger any change to Central Valley steelhead
12 migration patterns in the San Joaquin River basin. Also, WY 2012 Interim Flows would
13 not be released if natural flows approach channel capacity.

14
15 Increased flows upstream from the Merced River confluence may potentially trigger adult
16 Central Valley steelhead, primarily those migrating toward the Merced River, to stray
17 into the San Joaquin River upstream from the confluence. Straying could reduce the
18 Merced River population. However, the Hills Ferry Barrier operations would continue in
19 fall (during the WY 2012 Interim Flows) to prevent the unwanted upstream migration of
20 Central Valley steelhead just past the Merced River confluence during mid-September
21 through early December, when the barrier is operational. Reclamation would implement
22 the Steelhead Monitoring Plan (see Appendix D) and revise the monitoring dates in the
23 plan to correspond to the date that Hills Ferry Barrier is removed (mid-December) to the
24 estimated time VAMP-like flows would begin (March 15).

25
26 The Hills Ferry Barrier is a type of resistance weir commonly used to exclude and/or trap
27 anadromous fish in rivers. This barrier consists of panels aligned perpendicular to the
28 flow of the river with evenly spaced pipes that allow water, small fish, and particles to
29 pass but prevent larger anadromous fish such as Chinook salmon from passing upstream.
30 Operated by DFG since 1992, the Hills Ferry Barrier is typically installed in mid-
31 September and operated until it is removed in early December. DFG currently operates
32 the Hills Ferry Barrier near the town of Newman, approximately 300 feet upstream from
33 the confluence with the Merced River (in Reach 5).

34
35 The barrier's main purpose is to redirect upstream-migrating adult fall-run Chinook
36 salmon into suitable spawning habitat in the Merced River and prevent migration into the
37 mainstem San Joaquin River upstream, where conditions are currently unsuitable for
38 Chinook salmon. Central Valley steelhead migrate during fall and winter in a manner
39 similar to migration by fall-run Chinook salmon, and they have a similar body type;
40 therefore, maintenance of the Hills Ferry Barrier would continue for the purpose of
41 redirecting Chinook salmon during the fall WY 2012 Interim Flow period, through
42 December 1, 2011, when the barrier is removed. The barrier is expected to be equally
43 effective in redirecting any Central Valley steelhead.

44
45 NMFS permits the take of Federally listed threatened species for rescue and salvage by
46 various State and nongovernmental agencies through the ESA Section 10a(1)A and 4(d)

rules. In the unlikely event that ESA-listed anadromous fish, including Central Valley steelhead, stray into San Joaquin River reaches above the Merced River, these fish could be salvaged under these authorities. Additionally, DFG applies annually for an ESA Section 4(d) research permit and accompanying take limit for Central Valley steelhead from NMFS for operation of the Hills Ferry Barrier, which includes the release of any captured steelhead below the barrier. If Central Valley steelhead are encountered at or above the Hills Ferry Barrier during fall WY 2012 Interim Flows, the Central Valley steelhead would be released downstream in suitable reaches, as would be required by permit. Salvaged fish will likely have genetic samples (i.e., fin clips) taken. Such recovery would be conducted under and consistent with DFG's ESA Section 4(d) research permit. An ESA Section 4(d) research permit application for the 2012 operation of Hills Ferry Barrier will be submitted to NMFS by DFG. The 4(d) coverage from October 1, 2011 through December 31, 2011 would be covered under an existing permit. In October 2011, an application for a new permit that covers actions starting on January 1, 2012 will be sent to NMFS for review.

The Proposed Action includes implementation of the Steelhead Monitoring Plan that was developed by the Fisheries Management Workgroup in February 2011 (Appendix D) to check for Central Valley steelhead in the Restoration Area during spring Interim Flows. WY 2012 Interim Flows will continue from October 1 through September 30, 2012, consistent with the Exhibit B Settlement hydrographs. Hills Ferry Barrier is scheduled to be removed in mid-December of 2011. It is estimated that a VAMP-like flow will occur in the lower San Joaquin River tributaries from March 15th through April 30th. As a result, the critical timing for Central Valley steelhead monitoring within the Restoration Area would occur from mid-December through March 15th, as it is anticipated that steelhead would be attracted to tributary flows in the lower reaches. Reclamation will coordinate with the appropriate agencies to implement this plan and report results. The Steelhead Monitoring Plan calls for the implementation of up to three options to monitor for steelhead that could make it past Hills Ferry Barrier. The first option calls for the utilization of electrofishing at partial barriers and false upstream migration pathways such as Mud Slough, Salt Slough, Newman Wasteway, and drop structures at the mouth of the Eastside Bypass, Mariposa Bypass, and Sand Slough control structure. The second option would utilize large fyke trap(s) above the Merced River confluence and below false attraction and entrainment points. The third option would involve the use of weirs, with or without traps at false attraction locations and existing structures to detect, trap, and relocate Central Valley steelhead. The three options presented here may be used singularly or in combination, depending on physical river conditions and in coordination with NMFS and the SJRRP Fisheries Management Workgroup. All captured Central Valley steelhead would be tagged and transported downstream of the mouth of the Merced River in transport tanks. In the event a steelhead is encountered in the Restoration Area, NMFS will be notified immediately.

In the absence of a monitoring plan and management plan, the impacts to Central Valley steelhead may result in potential straying during the time when steelhead would be migrating. However, because of measures adopted to prevent straying of Merced River adult steelhead into the San Joaquin River upstream from the confluence, implementing

1 the WY 2012 Interim Flows would not result in significant impacts to Central Valley
2 steelhead. The Proposed Action would not exacerbate straying conditions for steelhead
3 during that period as the 350 cfs base flow from mid-December 2011 to January 31, 2012
4 would be within hydrologic conditions previously described for 350 cfs base flows from
5 October 1 to October 31, February 1 to February 28, and July 1 through September 30
6 and as analyzed for WY 2010 and 2011 Interim Flows.

7
8 The SMP shall be utilized to detect the presence or absence of steelhead that may enter
9 the Restoration Area. Effects to steelhead will be addressed through the 4(d) and/or
10 10(a)(1)(A) permit application process with NMFS. These impacts are anticipated to be
11 extremely minimal as historical data from the California Department of Fish and Game at
12 the Hills Ferry Barrier for the monitoring of fish at the barrier have yet to record Central
13 Valley Steelhead at the facility. Effects to the species in relation to the implementation of
14 the SMP are expected to be less than significant.

15
16 The SMP includes activities such as the utilization of nets, traps, and a raft electroshocker
17 to monitor aquatic species on a monthly basis. While the intent is to look for Central
18 Valley steelhead, other fish such as bass, carp, sucker, crappie, perch, and other species
19 could be encountered in association with investigative techniques in the Restoration Area.
20 Nets and traps will be checked regularly by trained fisheries professionals and any fish
21 caught will be released. While electroshocking does have a possibility to result in lethal
22 impacts to fish species, Reclamation is intending to reduce these impacts by only
23 monitoring in locations on a monthly basis, in order to avoid repeatedly electroshocking
24 the same individuals. Due care will be taken in proceeding with these monitoring
25 activities and all activities will be undertaken by experienced and qualified fisheries
26 biologists, whose qualifications will be on-file with NMFS. Because professional care
27 will be exercised in the monitoring of fish species in the Restoration Area and because
28 traps will be checked regularly and fish will be released upon their capture, impacts to
29 existing fish species in the San Joaquin River are anticipated to be less than significant.

30
31 When issuing a 4(d) or 10(a)(1)(A) permit for implementation of the SMP, NMFS will
32 perform an effects determination on the action of electroshocking, monitoring, and
33 tagging Central Valley steelhead within the lower Restoration Area. If Interim Flows are
34 not able to be released past Sack Dam at the volumes specified in the Settlement, and
35 flow constraints such as seepage, the maintenance of Mendota Pool, or other non-
36 discretionary actions such as flood flows were to occur, then the SMP would not be
37 implemented. If Interim Flows are able to be released up to the amounts analyzed in the
38 document, then the SMP would need to be implemented to monitor for potential impacts
39 to steelhead. If the permit is not issued by the time Hills Ferry Barrier is removed,
40 Reclamation would monitor flow releases to assess if flows make it to the confluence of
41 the Merced River. If flows do not create a continuous connection between the
42 Restoration Area and the lower San Joaquin River, steelhead would not be able to stray
43 into the Project Area and the SMP would not need to be implemented.

44 Reclamation will coordinate with NMFS and USFWS to ensure that impacts to listed
45 species will be avoided or minimized. This will be accomplished by providing and
46 discussing streamflow, including the contribution of Interim Flows to that metric, and

1 water quality data summaries. During periods when WY 2012 Interim Flows pass the
2 confluence of the Merced River, Reclamation will hold weekly conference calls with
3 NMFS and USFWS to discuss monitoring results and identify any potential impacts that
4 could require changes in Interim Flows.

5 Recapture of Interim Flows will only occur in compliance with regulatory requirements,
6 including the NMFS and USFWS Operations BOs, or the requirements in place at the
7 time of recapture. Additionally, no diversion of Interim Flows into unscreened facilities
8 downstream of the Restoration Area will occur.

9 In the event that WY 2012 Interim Flows are anticipated to cause impacts that are greater
10 than analyzed, in consultation with the fishery agencies, Reclamation will work with the
11 agencies to modify WY 2012 Interim Flow releases as needed to avoid or minimize
12 impacts. Possible modifications include reducing flow releases, upstream diversions of
13 flows to avoid downstream impacts, or constraining flows to the upper San Joaquin River
14 (upstream of the confluence with the Merced River). This coordination between the
15 agencies and Reclamation's commitment to modify flows based on real time conditions
16 would ensure that the impacts of the WY 2012 Interim Flows would be less than
17 significant.

18 The Proposed Action is not expected to result in any measureable changes later in time to
19 water levels, riparian vegetation, or other habitat conditions for listed species.

20 Because WY 2012 Interim Flows would be confined within the existing channel, would
21 not increase flood flow levels, would last for only a single year, and would fall within the
22 range of and be timed to be similar to historical flows, implementation of Interim Flows
23 in WY 2012 would not result in adverse changes in conditions affecting fish species or
24 their habitats in the Restoration Area, and would not result in cumulative effects.

25 Therefore, for the same reasons as described in the Final EA/IS for the WY 2010 Interim
26 Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows
27 Project, the Proposed Action would not result in substantial adverse effects to fish
28 resources (including listed, special-status, native, or migratory fish species) or their
29 habitats. Implementation of the Proposed Action would result in less than significant
30 impacts to Fish Biological Resources.

31 ***Hydrology and Water Quality***

32 The flow schedule presented for WY 2012 Interim Flows is different than WY 2010 and
33 2011 because a 350 cfs flow release from Friant Dam will occur from November 11,
34 2011 through January 31, 2012. For WY 2010 and 2011 there was no scheduled Interim
35 Flow release for this period. The Interim Flow release during this time frame is consistent
36 with Exhibit B of the Settlement hydrograph and would provide important additional
37 information related to temperature, flows, sediment mobility, and water quality. Flows
38 releases made from November 11, 2011 through January 31, 2012 would be the same as
39 350 cfs "base flow" releases during other times of the year during WY 2010 and 2011
40 Interim Flows. The impacts associated with this change are not a significant adverse
41 impact as this would be the same flow regime that was scheduled to occur from October
42 1 through October 31, February 1 through February 28, and July 1 through September 30
43 during the WY 2010 and 2011 Interim Flows Projects.

Flow releases during this time frame would be limited to 350 cfs and would continue to be constrained by downstream channel constraints such as capacity and seepage concerns. The timing for this release does not have the potential to change the environmental impacts discussed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Reclamation would continue to coordinate with landowners and stakeholders to ensure that Interim Flows do not cause significant impacts. For the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action would result in less than significant impacts to Hydrology and Water Quality.

3.2.3 Mandatory Findings of Significance

Although this document is a Supplemental EA under NEPA and does not require that findings of significance be made, this section is included here for consistency with the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Under Section 15065(a) of the CEQA Guidelines, a finding of significance is required if a project “has the potential to substantially degrade the quality of the environment.” Section XVII of the CEQA Checklist (Appendix G to the CEQA Guidelines [14 CCR secs. 15000-15387]) includes the following questions related to Mandatory Findings of Significance:

- a) **Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?**

As presented in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project and the resource discussion above, implementing the Proposed Action would not substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of an endangered, rare, or threatened species. The Proposed Action could cause a significant adverse effect by accelerating the spread of several invasive plant species already present along the San Joaquin River, but this effect would be less than significant with mitigation. Therefore, this impact would be less than significant. The Proposed Action could cause a significant adverse impact to migrating Central Valley steelhead between December 1, 2011 and March 15, 2012 due to false attraction from flows. However, with the implementation of the Steelhead Monitoring Plan, the impact would be less than significant. The release of WY 2012 Interim Flows could result in the entombment of BNLL within the Eastside or Mariposa Bypasses. With the implementation of the same RPMs required by the USFWS BO for WY 2011 Interim Flows, BNLL would be monitored and reported on and impacts to BNLL would be less than significant.

b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

CEQ regulations that implement NEPA provisions define “cumulative effects” as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively significant, actions over time, and can differ from indirect impacts (40 CFR 1508.8). Cumulative effects are caused by the incremental increase in total environmental effects when an evaluated project is added to other past, present, and reasonably foreseeable future actions. Cumulative effects can thus arise from causes that are totally unrelated to the project being evaluated, and the analysis of cumulative effects considers the life cycle of the effects, not the project at issue. These effects can be either adverse or beneficial. Cumulative impacts are defined in the State CEQA Guidelines (14 CCR Section 15355) as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” A cumulative impact occurs from “the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time” (14 CCR Section 15355(b)).

No past, current, or probable future projects were identified in the project vicinity that, when added to project-related impacts, would result in a significant cumulative impact, and that would be cumulatively considerable. Projects considered in the cumulative analysis include: WY 2010 and 2011 Interim Flows Project, SJRRP, and the Friant-Kern and Madera Canals Capacity Correction Project. Although land development activities are occurring adjacent to the San Joaquin River, these activities would be conducted outside of the river corridor and would not be affected by Interim Flow releases. Implementation of releases during WY 2012 would not result in any net increase in water allocations to federal or state water contractors and land-based cumulative impacts are not anticipated to occur.

Although the WY 2010 and 2011 Interim Flows Project and SJRRP are related to implementation of the WY 2012 Interim Flows, they would not overlap with the Proposed Action. As discussed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the only potential for cumulative effects between the WY 2010 and 2011 (and similarly, WY 2012) Interim Flows releases and the SJRRP PEIS/R would be Friant Division water supplies. Under the WY 2012 Interim Flows, recirculation of recaptured water to the Friant Division could require mutual agreements between Reclamation, DWR, Friant Division long-term contractors, and other south-of-Delta CVP/SWP contractors. Reclamation is working with the Friant Division long-term water contractors

1 to prepare a separate Environmental Assessment to determine possible mechanisms to
2 either exchange or deliver to the Friant Division long-term contractors recaptured water
3 stored in San Luis Reservoir. Potential reductions in the amount of water delivered to
4 agricultural users resulting from the ability to recapture water (e.g., if capacity in
5 CVP/SWP storage conveyance facilities is limited) could occur under the Proposed
6 Action. Although reductions in agricultural water deliveries are possible, occurrence of
7 delivery reductions under the Proposed Action would be reduced or avoided through
8 recapture, recirculation, and other means consistent with and as described in the
9 Settlement to limit adverse water supply impacts on the Friant Division long-term
10 contractors.

11
12 The SJRRP was developed to implement the Settlement. Although the individual
13 resource discussions consider the impacts of implementing the WY 2012 Interim Flows
14 (e.g., one year of Interim Flow releases), the SJRRP PEIS/R will evaluate the program-
15 level and cumulative effects of the future potential implementation of the SJRRP,
16 including the project-level and cumulative effects of both Interim Flows and Restoration
17 Flows.

18
19 Additionally, consideration of the potential cumulative effects of the WY 2010 and 2011
20 Interim Flows Project with Friant-Kern and Madera Canals Capacity Correction Project
21 was addressed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft
22 and Final Supplemental EAs for the WY 2011 Interim Flows Project. The continued
23 release of Interim Flows during WY 2012 would not overlap with the Friant-Kern and
24 Madera Canals Capacity Correction Project spatially or temporally. Because the Friant-
25 Kern and Madera Canals Capacity Correction Project would not be completed until after
26 the Proposed Action is implemented, and the Proposed Action would result in no net
27 change in Millerton Lake water storage, there would be no cumulative effects between
28 the Proposed Action and the Friant-Kern and Madera Canals Capacity Correction Project.
29 If permitting and environmental work for the Friant-Kern and Madera Canals Capacity
30 Correction Project were accelerated to include a construction and completion timeframe
31 that overlaps with WY 2012 Interim Flows, then the cumulative impacts of implementing
32 the canal project(s) with releases of WY 2012 Interim Flows at the same time would be
33 assessed in further environmental documentation.

34
35 Therefore, as discussed in Final EA/IS for the WY 2010 Interim Flows Project and the
36 Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project and as
37 described above, the Proposed Action would result in less than significant cumulative
38 effects.

39 **c) Does the project have environmental effects that will cause substantial**
40 **adverse effects on human beings, either directly or indirectly?**

41 As discussed in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and
42 Final Supplemental EAs for the WY 2011 Interim Flows Project and discussed in this
43 Supplemental EA, no project-related environmental effects were identified that would
44 cause substantial adverse effects on human beings, either directly or indirectly. The
45 impact would be less than significant.

3.2.4 Indian Trust Assets

As described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the proposed Action would not affect Indian Trust Assets.

3.2.5 Socioeconomic Effects and Environmental Justice

As described in the the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, and as discussed under the resource-specific discussions above, the proposed Action would have limited socioeconomic effects and would not result in Environmental Justice effects (e.g., disproportionately burden minority groups, low-income populations, or Native American Tribes).

3.2.6 Mitigation Measures

The following mitigation measures were implemented as part of the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project to avoid or minimize potential environmental impacts. These mitigation measures also would be implemented during WY 2012 Interim Flow releases to reduce the potential environmental impacts of the Proposed Action to less-than-significant levels.

- **Mitigation Measure Bio-1: Implement an Invasive Vegetation Management Plan.** Reclamation shall monitor red sesbania, salt cedar, giant reed, Chinese tallow, and sponge plant along affected portions of the San Joaquin River and bypass system (before and after WY 2010 Interim Flows, and during WY 2012 Interim Flows) and control and manage these species as specified in the Invasive Species Monitoring and Management Plan included as Appendix F of the WY 2010 Final EA/IS.

The Environmental Commitments described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project and in Section 2 of this document will continue during implementation of the WY 2012 Interim Flows. Therefore, the Proposed Action would result in no new significant impacts or a substantial increase in the severity of impacts previously analyzed in the the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project. Therefore, for the same reasons as described in the Final EA/IS for the WY 2010 Interim Flows Project and the Draft and Final Supplemental EAs for the WY 2011 Interim Flows Project, the Proposed Action would result in less than significant impacts with mitigation incorporated.

4.0 Consultation and Coordination

This section reviews agency consultation and coordination that occurred before and during preparation of this Supplemental EA, and reviews the steps in the NEPA review process that follow release of this Supplemental EA. A description of the overall SJRRP outreach activities is provided in Section 5 of the WY 2010 Final EA/IS.

4.1 Consultation and Coordination for WY 2010 Final EA/IS

In accordance with NEPA/CEQA review requirements, the Draft EA/IS for the WY 2010 Interim Flows was distributed for agency and public review and written comment for a 30-day period, as specified in the NOI and the Notice of Availability. Notice of release of the Draft EA/IS was provided to all individuals on the SJRRP public notification mailing list, which is updated automatically when individuals access the public Web site (www.restoresjr.net) and place themselves on the mailing list. The Draft EA/IS distribution provided interested parties with an opportunity to express their views regarding the significant environmental effects and other aspects of the Proposed Action, and also provided information pertinent to permits and approvals to decision makers at Reclamation, DWR, other Implementing Agencies, and CEQA responsible and trustee agencies.

After the public comment period closed, Reclamation and DWR (WY 2010 only) prepared written responses to comments. Based on the Final EA and all public comments, Reclamation determined that the impacts of the Proposed Action did not warrant preparation of an EIS, as documented in the FONSI signed on September 25, 2009 for WY 2010 Interim Flows.

4.2 Consultation and Coordination for WY 2011 Draft and Final Supplemental EA

In accordance with NEPA, the Draft Supplemental EA for the WY 2011 Interim Flows Project was distributed on June 3, 2010 for agency and public review and written comment. The comment deadline ended on July 20, 2010. Notice of release of the Draft Supplemental EA was provided to all individuals on the SJRRP public notification mailing list, which is updated automatically when individuals access the public Web site (www.restoresjr.net) and place themselves on the mailing list. The Draft EA/IS distribution provided interested parties with an opportunity to express their views regarding the significant environmental effects and other aspects of the Proposed Action, and also provided information pertinent to permits and approvals to decision makers at Reclamation.

1 After the public comment period closed, Reclamation prepared written responses to
2 comments. Based on the Draft and Final Supplemental EA and all public comments,
3 Reclamation determined that the impacts of the Proposed Action did not warrant
4 preparation of an EIS, as documented in the FONSI signed on September 21, 2010 for
5 WY 2011 Interim Flows.

6 **4.3 Current Steps in the NEPA Review Process**

7 In accordance with NEPA review requirements, this Supplemental EA is being
8 distributed for agency and public review and written comment for a 30-day period, as
9 specified in the press release. Notice of release of this Supplemental EA will be provided
10 to all individuals on the SJRRP public notification mailing list. The Supplemental EA
11 distribution provides interested parties with an opportunity to express their views
12 regarding the significant environmental effects and other aspects of the Proposed Action,
13 and also provides information pertinent to relevant permits and approvals.
14

15 After the public comment period closes, Reclamation will prepare written responses to
16 comments, as needed, and attach the comment letters and responses as an appendix to the
17 Final Supplemental EA. If, based on the Final Supplemental EA and all public comments,
18 Reclamation decides that the impacts of the Proposed Action do not warrant preparation
19 of an EIS, the FONSI will be signed by Reclamation.
20

21 Additionally, as part of the ESA Section 7 requirements for the Proposed Action, a list of
22 Federal threatened and endangered species, species proposed for listing, and species that
23 potentially occur within the study area was obtained from USFWS and NMFS.
24 Reclamation is engaging in consultation with USFWS and NMFS on the WY 2012
25 Interim Flows. A BA has been prepared by Reclamation and has been provided to
26 USFWS and NMFS for review.

1 **5.0 List of Preparers and Contributors**

2 **United States Department of the Interior, Bureau of** 3 **Reclamation Mid-Pacific Regional Office**

4 Alicia Forsythe, Program Manager
5 Michelle Banonis, Natural Resource Specialist
6 David Mooney, Ph.D., Program Engineer
7 Mario Manzo, Project Manager
8 2800 Cottage Way, MP-170
9 Sacramento, CA 95825
10 (916) 978-5457

This page left blank intentionally.

6.0 Literature Cited

- Brewer, Shannon, Jeff McLain, and Eric Guzman. 2010. Water Temperature Variation from Friant Dam to Sack Dam during the 2009 Fall Interim Flow Period. San Joaquin River Restoration Fisheries Management Work Group. Memo to file.
- Endangered Species Recovery Program (ESRP), California State University, Stanislaus. 2009. Habitat Assessment and Surveys for Blunt-Nosed Leopard Lizards (*Gambelia sila*) Along the Eastside Bypass, Merced County, California. Prepared by S. Phillips, C. Wilkinson, F. Vang, and P. Kelly. Prepared for the U.S. Bureau of Reclamation, South-Central California Area Office. September 22, 2009.
- Federal Energy Regulatory Commission (FERC). 2009. Order on Rehearing, Amending License, Denying Late Intervention, Denying Petition, And Directing Appointment of a Presiding Judge for a Proceeding on Interim Conditions. Docket Nos. 2299-065 and 2299-053. Issued July 16, 2009.
- 2009. Final Report of the Presiding Judge on Interim Measures, Project Nos. 229-065 and 229-053. Issued November 20, 2009.
- National Oceanic and Atmospheric Association, National Marine Fisheries Service (NMFS). 2009. Biological and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project. Issued June 4, 2009.
- 2010. National Marine Fisheries Service Determination re: Action III.1.3, Action IV.2.1, & Action IV.2.2 of the Biological Opinion on the Long-Term Operations of the Central Valley Project and State Water Project (Opinion). March 29, 2010.
- San Joaquin River Restoration Program (SJRRP). 2007a. SJRRP Program Public Involvement Plan. http://www.restoresjr.net/program_library/02-Program_Docs/index.html. Accessed March 22, 2010.
- 2007b. SJRRP Public Scoping Report. http://www.restoresjr.net/program_library/02-Program_Docs/index.html. Accessed March 22, 2010.
- 2008. Draft Monitoring Plan for Physical Parameters Technical Memo. http://www.restoresjr.net/program_library/03-Tech_Memoranda/index.html. Accessed March 22, 2010.
- 2009. Fisheries Management Plan: A Framework for Adaptive Management in the San Joaquin River Restoration Program. http://restoresjr.net/program_library/03-Tech_Memoranda/index.html. Accessed March 24, 2010.

- 2010a. SJRRP Seepage Daily Evaluation – “Daily Evaluations when Interim Flows are above 475 cfs in Reaches 2A and 3”.
<http://www.restoresjr.net/activities/if/index.html>. Accessed March 23, 2010.
 - 2010b. SJRRP Flow Bench Evaluations.
<http://www.restoresjr.net/activities/if/index.html>. Accessed March 19, 2010.
 - 2010c. Draft 2009 Annual Technical Report.
<http://www.restoresjr.net/activities/if/index.html>. Accessed March 19, 2010.
 - 2010d. SJRRP 2009-2013 Interim Flow Release Program, Water Quality Monitoring Plan. http://www.restoresjr.net/program_library/02-Program_Docs/index.html. Accessed March 22, 2010.
 - 2010e. SJRRP 2009 Water Quality Monitoring Results.
<http://www.restoresjr.net/activities/if/index.html>. Accessed March 19, 2010.
 - 2010f. SJRRP Fisheries Implementation Plan 2009-2010 January 12, 2010 Draft Fisheries Management Work Group
http://www.restoresjr.net/program_library/02-Program_Docs/DraftFisheries. Accessed May 15, 2010.
 - 2011g. SJRRP 2010 Annual Technical Report. April 11, 2011.
<http://www.restoresjr.net/flows/atr.html>. Accessed May 9, 2011.
 - 2011h. Monitoring Plan for Central Valley Steelhead. Fisheries Management Workgroup. February 11, 2011.
- United States Department of the Interior, Bureau of Reclamation (Reclamation). 2010. Submittal of Sediment and Water Quality Monitoring Data Called for in Condition 22 of Order WR 2009-0058-DWR. Letter to the State Water Resources Control Board dated January 22, 2010.
- United States District Court, Eastern District of California. 2009. Findings of Fact and Conclusions of Law and Order (Dpcs 82 & 83). Consolidated Delta Smelt Cases, No. 1:09-cv-00407-OWW-DLB. Document 94. Filed May 29, 2009.
- 2010. Memorandum Decision Re Cross-Motions for Summary Judgment on NEPA Issues (Dpcs 82 & 83). Consolidated Salmonid Cases, No. 1:09-cv-1053 OWW DLB. Document 266. Filed March 5, 2010.
- United States Fish and Wildlife Service (USFWS). 2008. Delta Smelt Biological Opinion of the Operating Criteria and Plan for the Continued Operations of the Central Valley Project and State Water Project. Issued on December 15, 2008.