

1 **24.0 Visual Resources**

2 This chapter evaluates the potential effects of the Project on visual resources in the
3 Project area. First, information is presented on existing visual resources and activities
4 known to occur in proximity to Reach 2B of the San Joaquin River. The information is
5 based on site visits, technical documents, and local and regional plans in the area. Using
6 this information as context, the analysis of visual-related impacts of the Project is
7 presented based on the characteristics of the Project alternatives including the character,
8 Project exposure, and existing visual conditions.

9 **24.1 Environmental Setting**

10 The visual resources of an area include the features of its landforms, vegetation, water
11 surfaces, and cultural modifications (physical changes caused by human activities) that
12 give the landscape its inherent visual qualities. Landscape features, natural appearing or
13 otherwise, form the overall impression of an area. This impression is referred to as
14 “visual character.” Visual character is studied as a point of reference to assess whether a
15 given project/action would appear compatible with the established features of the setting
16 or would contrast noticeably and unfavorably with them.

17 Visual resources also have a social setting, which includes public expectations, values,
18 goals, awareness, and concern regarding visual quality. This social setting is addressed as
19 “visual sensitivity,” the relative degree of public interest in visual resources and concern
20 over adverse changes in the quality of that resource. As applied to visual impact analyses,
21 sensitivity refers to public attitudes about specific views, or interrelated views, and is of
22 key importance to identifying critical public views, assessing how important a visual
23 impact may be, and whether or not it represents a significant impact.

24 **24.1.1 Critical Public Views**

25 Critical public views are sensitive public views that would be most affected by Project
26 actions (e.g., views with the greatest intensity of potential impact due to viewer proximity
27 to the Project, Project visibility, and duration of the affected view). Identifying critical
28 public views relies on the concept that sensitivity is a function of the viewer’s
29 expectations, activities, awareness, values, and goals. Public sensitivity is not always
30 related to obvious aesthetic appeal. The public may confer visual significance on
31 landscape components and areas that would otherwise appear unexceptional (Federal
32 Highway Administration [FHWA] 1981); therefore, the visual resource setting is not
33 described in terms of aesthetic appeal. Instead, the importance of the affected landscape
34 is inferred from the indicators of sensitivity. The degree of visual sensitivity is treated as
35 occurring at one of four levels as follows:

- 36 • *High Sensitivity.* High sensitivity indicates a great potential for the public to react
37 strongly to any lessening of visual quality. Concern is expected to be great

1 because the affected views are rare, unique, or are special to the region or locale
2 in other ways. Also, high visual sensitivity is assumed to exist where landscapes,
3 particular views, or the visual characteristics of certain features are protected
4 through policies, goals, objectives, and design controls in public planning
5 documents.

6 • *Moderate Sensitivity.* Moderate sensitivity indicates a substantial potential for the
7 public to voice some concern over visual impacts of moderate to high intensity.
8 Often, the affected views are secondary in importance or are similar to others
9 commonly available to the public. Noticeably adverse changes would probably be
10 tolerated if the essential character of the views remains dominant.

11 • *Low Sensitivity.* Low sensitivity indicates that a small minority of the public may
12 have a concern over scenic/visual resource impacts on the affected area. Only the
13 greatest intensity of adverse change in the condition of aesthetics/visual resources
14 would have the potential to register with the public as a substantial reduction in
15 visual quality.

16 • *No Sensitivity.* No sensitivity indicates that the views are not available to the
17 public, there are no identifiable indications of public interest in the quality of
18 scenic/visual resources within potentially affected public views, or there's no
19 concern over adverse impacts to those scenic/visual resources.

20 The range of sensitive views was considered and several representative views in which
21 the Project features would be most noticeable were selected for detailed analysis. The
22 selection was based primarily on proximity to Project features and the degree and
23 duration of exposure within sensitive public views. Consideration was also given to
24 having the views be representative of the public experience (i.e., that they be from
25 viewing positions frequently used by the public and readily located).

26 Within the Project area, public access is extremely limited and there are few public
27 viewing positions from which any of the features of the Project may be seen. Land along
28 the river reach is predominantly in private ownership and used for agricultural
29 production. Public access is limited to the San Mateo Avenue crossing from the north
30 along Road 13, which is a Madera County-maintained road up to, but not crossing the
31 river. Access to the crossing from the south along San Mateo Avenue is unauthorized, as
32 the road passes through private land. Public access to the Project area elsewhere is
33 limited to Mendota Pool via a public park, a short stretch of the San Joaquin River below
34 Mendota Dam, and at a few areas along the west shore of Mendota Pool immediately
35 upstream of the dam. Public access to Mendota Dam itself is restricted. Additionally,
36 there are four homes at the north end of Bass Avenue, and the residents would have
37 visual access to features of two of the Project alternatives from the road approaching or
38 leaving these homes.

39 Concerning existing public access to the San Joaquin River, see Section 20.1.3. Also see
40 Section 16.1.1 for a description of the public trust easement under the California State
41 Lands Commission (CSLC). To access the easement, legal access is required – the public
42 is not entitled to cross private lands to use a public trust easement.

1 **San Mateo Avenue Crossing**

2 The San Mateo Avenue crossing is a dip crossing consisting of a culvert to convey low
3 flows and an earthen embankment supporting the roadbed. During higher flows the road
4 is overtopped and may be impassable to vehicles. Prior to Interim Flows, the river bed
5 here was dry for most of the year and informally used for off-highway vehicle use. When
6 flows are present, the public access the river at this location to swim (field observation)
7 and to launch non-motorized watercraft for fishing and other purposes (see Chapter 20.0,
8 “Recreation”). Recreation uses imply variable sensitivity to the potential for adverse
9 impacts on the quality of the visual resources.

10 It is unknown how many people access the river from the south along San Mateo Avenue
11 compared to the north along Road 13. As noted, San Mateo Avenue is not a public road
12 2.5 miles north of Highway 180 and access to the river using this road is unauthorized. It
13 is assumed that people using the southern approach are predominately coming from
14 Mendota (7.3 miles from the center of town to the crossing), while those using the
15 northern route are coming from Firebaugh (11.6 miles away from the river crossing
16 starting at Highway 33).

17 The volume of recreation use here is not known, but there are indications that the number
18 of recreationists using the river crossing is small compared to the number enjoying the
19 river near Mendota (discussed below) and Firebaugh. For example, there are a number of
20 recreation opportunities along the river in Firebaugh that are close at hand, and access to
21 fishing opportunities below Mendota Dam and in Mendota Pool are closer to Firebaugh
22 than those at or near the river crossing. These recreation opportunities in Firebaugh or
23 nearby, coupled with a circuitous and lengthy route to the river crossing, suggests that the
24 crossing receives little public use compared to the sites at and near Firebaugh and
25 Mendota. Additionally, public parking at or near the river crossing is limited, and there
26 appear to be no turnouts in the public right-of-way along Road 13 (the closest public
27 road), limiting the number of recreationists. Also, parking along the private dirt road on
28 the Madera County side of the river is not authorized.

29 Sensitivity: Low. Anecdotal evidence for fishing, watercraft put-in, and off-highway
30 vehicle opportunities suggest that there is some recreation at the river crossing; therefore,
31 there may be some public sensitivity to potential visual impacts to the views of and from
32 the river crossing. Undesignated but popularly used or appreciated recreation sites are
33 treated as having moderate sensitivity; however, this site is of comparatively low
34 popularity as compared to other river recreation sites in the vicinity (California
35 Department of Fish and Wildlife [DFW] 2013). As a result, sensitivity for the potentially
36 affected views at the river crossing is expected to be low.

37 Project Exposure: High. Under all Project alternatives, the San Mateo Avenue crossing
38 would be modified. It would either be removed or improved to maintain vehicular access
39 and accommodate increased flow magnitudes, durations, and frequencies associated with
40 Restoration Flows. The improved crossing would entail a low flow or dip crossing with
41 five 24-foot-span by 9-foot-rise concrete box culverts. Additionally, armoring would be
42 installed along the entrance and exit of the structure and along the channel banks near the
43 structure. These proposed structures would be in the foreground of views from the

1 vicinity of the river crossing. As a result, these views are considered to be critical public
2 views.

3 ***Mendota Pool Park***

4 Mendota Pool Park is about 0.75 mile from the northern city limits of Mendota, along
5 Bass Avenue, and is the only public recreation facility in the Project area (see Chapter
6 20.0, “Recreation”). This 85-acre park is the largest of three in Mendota, providing active
7 recreation facilities as well as areas for passive pursuits such as picnicking. Mendota Pool
8 Park offers: a ball field; picnic tables; a playground; a stage; open space; access to
9 Mendota Pool; and vehicular access at the park’s southeast and northeast corners. From
10 there, informal paths lead directly to and along over 1,000 feet of shoreline. A limited
11 number of trash receptacles and picnic tables are provided close to the shore at the park’s
12 southeast and northeast corner, and pole-mounted directional lighting provides for
13 evening use of some of the park’s facilities.

14 While there are no boat launch facilities at the park, a paved boat launch is located off the
15 gravel road leading to Mowry Bridge just north of Mendota Pool Park and the Delta-
16 Mendota Canal (DMC). This facility primarily provides access to Fresno Slough and the
17 part of Mendota Pool adjacent to the park. In addition to passive recreation occurring
18 within the central part of the park, fishing from shore is a major park activity, as is
19 boating and fishing out on the water.

20 Sensitivity: High. For this assessment, boating and fishing opportunities in this part of
21 Mendota Pool are treated together with the public use of the park due to the proximity of
22 these recreation uses (note that the Mendota Dam area is not accessible to boaters from
23 Mendota Pool Park since Mowry Bridge serves as a barrier to downstream access).
24 Because Mendota Pool Park is the only public recreation facility in the Project vicinity
25 and views of and from developed recreation sites are treated as highly sensitive,
26 sensitivity for the potentially affected views at Mendota Pool Park is expected to be high.

27 Project Exposure: Low to High. It is unlikely that Project features would be visible from
28 public viewing positions within the park under two of the Project alternatives
29 (Alternatives A and B); however, under the two Fresno Slough Dam alternatives
30 (Alternatives C and D), a dam and new surface water canals constructed near Mowry
31 Bridge would be visible from shore (970 to 1,238 feet away) or by boat. For example,
32 exposure is expected to be low for users in the park because of the existing levees that
33 obscure views of Fresno Slough, but moderate for users along informal paths near the
34 existing levees (Fresno Slough Dam would be in the background of the view). Also, since
35 boaters may be closer to the dam than users in the park or on informal paths near the
36 levees, exposure may be expected to be high (with Fresno Slough Dam in the foreground
37 of the view). Therefore, Project exposure is expected to be low to high depending on the
38 viewer’s distance to the potential Fresno Slough Dam. As a result, these views are
39 considered to be critical public views.

40 ***Mendota Dam Area***

41 The “Mendota Dam area” comprises part of Mendota Pool (above Mendota Dam and
42 north of Mowry Bridge), Mendota Dam, and the area along the river immediately

1 downstream of Mendota Dam. There is a relatively high informal recreation use in this
 2 area (DFW 2013), including recreation on private property upstream and downstream of
 3 Mendota Dam along the shore. Activities along the shore include fishing, picnicking, and
 4 swimming. The use area includes more than 425 feet of the river's left bank, starting at a
 5 point immediately downstream of the dam. This area of the river is important to the
 6 residents of Mendota, given that it is their only proximate access to the river.
 7 Additionally, an unpaved watercraft put-in site is located here (see Figure 24-11), which
 8 serves DFW patrols, kayakers, and hunters wishing to access downstream portions of the
 9 river. This site is readily accessed via Bass Avenue, a public road, and there is substantial
 10 parking in an unpaved area adjacent to the road.

11 Because Mendota Dam and the areas upstream and downstream of the dam are privately-
 12 owned by Central California Irrigation District (CCID), fishing and boat launching
 13 activities are considered unauthorized uses in this area. There are signs and barriers
 14 restricting access at Mendota Dam, but there are none located upstream and downstream
 15 of the dam. The CCID, however, has no enforcement capabilities. Given the overtly
 16 restricted access, views from the dam are not addressed as public views.

17 Sensitivity: Moderate. The views from the areas downstream of the dam, along the river,
 18 and along Mendota Pool's west shore are addressed, as they are associated with obvious
 19 and documented recreation use that, though unauthorized, is unrestricted. Views of, and
 20 from, undesignated but popularly used areas of recreational significance to a local
 21 population are treated as moderately sensitive. Additionally, views from Bass Avenue,
 22 which is the primary access to these recreation sites, are also moderately sensitive where
 23 they occur from points within less than 0.5 mile from them. As a result, sensitivity for the
 24 potentially affected views at the Mendota Dam area is expected to be moderate.

25 Project Exposure: Low to High. Under the two Compact Bypass Alternatives
 26 (Alternatives A and B), no construction would occur near the Mendota Dam area.
 27 However, under the two Fresno Slough Dam alternatives (Alternatives C and D), a fish
 28 ladder would be constructed at Mendota Dam, flashboards would be removed, and the
 29 dam's sill would be notched. Associated construction activities (truck traffic, presence
 30 and movement of a work force, and heavy equipment) would be within the foreground of
 31 shore-based views in the Mendota Dam area and from Bass Avenue, just west of the dam.
 32 Additionally, the implementation of Alternatives C and D would lower the water surface
 33 elevation in the San Joaquin River arm of Mendota Pool, a change which would be within
 34 the immediate foreground of views from the west bank of this area, where some fishing
 35 occurs. Additionally, views from the fishing area and from Bass Avenue are moderately
 36 sensitive for the reasons stated above. Therefore, Project exposure is expected to be low
 37 to high depending on the viewer's distance to Project features.

38 ***Bass Avenue and Bass Avenue Residences***

39 At the north end of Bass Avenue there is a group of four homes, which constitute a minor
 40 aggregation of rural residences.

41 Sensitivity: Low. Views from these residences, together with the views from the
 42 proximate stretch of Bass Avenue, their only access route, are of low sensitivity.

1 Project Exposure: Low. With the exception of the levee along Reach 3 adjacent the Bass
2 Avenue residential area, which would be improved in two of the Project alternatives,
3 views of Project features from the homes would not occur due to complete screening
4 afforded by riparian vegetation along the west bank of the river. From Bass Avenue there
5 would be limited views of the river and Mendota Dam and broad views of the area behind
6 Mendota Dam. Changes to Mendota Dam and associated construction activity would be
7 nearly ¼-mile distant for road-based views, as would changes to the Mendota Dam area
8 due to the construction of Fresno Slough near Mowry Bridge. Therefore, Project
9 exposure is expected to be low.

10 **24.1.2 Existing Visual Conditions**

11 The existing visual condition of the landscape is the point of reference for evaluating the
12 intensity of potentially adverse changes to the landscape. This attribute is defined by the
13 prevailing character of the setting and the degree to which past actions have adversely
14 affected that character and its quality. It is assessed only for critical public views. Both
15 the existing daytime visual conditions of the critical public view and the existing night
16 lighting conditions are considered. Visual condition is addressed as the degree to which
17 features of the setting and sources of lighting are *congruent* with the established,
18 dominant character of the setting, and in terms of the *coherence* of the pattern in which
19 these features and lighting sources are distributed. Visual condition is also addressed
20 relative to “visual access”: the extent to which historically available scenic views have
21 become blocked or have become less accessible to the public.¹

22 Visual character is defined in terms of the physical features that have become accepted
23 over time as inherent to the area, those reflecting how the landscape was formed (e.g.,
24 ecological processes versus human activities), how it functions (e.g., serving land uses or
25 ecological relationships), and how it is structured.

- 26 • Congruence (Intactness). Where past actions have noticeably and unfavorably
27 changed landscape features, or introduced incompatible features, results appear
28 incongruent with the inherent character of the area. In terms of the FHWA (1981)
29 methodology, congruence is the landscape’s state of “intactness,” the integrity of
30 the character type in terms of the degree to which “encroaching elements” may be
31 present.
- 32 • Coherence (Unity). Where internal consistency and harmony of landscape
33 features have been affected by past actions, results can lack coherence. A
34 landscape may be “intact” relative to the type of features within view, yet past
35 actions may have resulted in there being little to no discernible pattern,
36 composition and/or harmony associated with those features. In terms of the
37 FHWA (1981) methodology, this is the landscape’s degree of “unity.”
- 38 • Visual Access. Apart from its physical features, the affected landscape is also
39 described in terms of the physical conditions under which it is viewed. These
40 include the public’s physical access to views, the breadth of available views
41 (panoramic or narrowly focal), their duration and timing. Past actions may have

¹ The attribute of Visual Access is relevant to two of the six visual impact categories described in Section 24.3.1: Impact AES-1 and Impact AES-2.

1 limited physical access to formerly available viewing positions or partially or
 2 totally blocked visual resources from public view, shortened view duration, or
 3 altered when the views are available.

4 Regarding night lighting conditions, “light” refers to artificial light emissions, or the
 5 degree of brightness, generated by a given source, and “glare” occurs when light
 6 adversely affects a viewer. The existing condition of light and glare is defined by the
 7 following characteristics:

- 8 • Lighting Character. The character of lighting is defined in terms of the types of
 9 lighting present and their pattern of illumination. Illumination may be described in
 10 terms of: (1) *Ambient Lighting*, the general overall level of lighting in a given
 11 area; (2) *Corona*, which is the diffuse halo of light that exists above a lit area; and
 12 (3) *Glare*, as defined above. Glare is an adverse effect of past actions.
- 13 • Congruence (Intactness). As with daytime visual conditions, this attribute is the
 14 degree to which past actions have noticeably and unfavorably changed the type
 15 and/or intensity of lighting in an area such that the result appears incongruent with
 16 the inherent character of lighting there.
- 17 • Coherence (Unity). As it pertains to lighting, coherence is the internal consistency
 18 of scale, pattern and organization of the sources and effect of lighting relative to
 19 the potentially affected area.

20 The visual modification class (VMC) approach reflects the concepts and principles of the
 21 Visual Resource Management methodologies in use by the following Federal agencies:
 22 U.S. Department of Agriculture, Forest Service (USFS 1974, 1995); U.S. Department of
 23 Interior, Bureau of Land Management (BLM 1984); and U.S. Department of
 24 Transportation Federal Highway Administration (FHWA 1981). Existing visual
 25 conditions are evaluated as being within one of four VMCs, as summarized below. Note
 26 that the anticipated future condition of a landscape expected as a result of implementing a
 27 proposed project is also described in terms of VMCs.

- 28 • *VMC 1: Not Noticeable*. VMC 1 conditions occur when all features and sources of
 29 lighting appear congruent with the prevailing landscape character and are
 30 coherently arrayed. In VMC 1 landscapes, recognized and valued scenic views
 31 have not been, or would not be, noticeably blocked or screened by past or planned
 32 activities and physical access to recognized and valued viewing positions has not
 33 been, or would not be, noticeably affected by such activities.
- 34 • *VMC 2: Noticeable, Visually Subordinate*. VMC 2 conditions occur where
 35 landscape features and sources of light and glare have been noticeably affected by
 36 past actions, or would be so affected in the future. (The changes are expected to
 37 attract some attention but not compete for it with the established features in the
 38 field of view.) Or where recognized and valued scenic views have become, or
 39 would become, partially blocked by past or planned activities, and/or access to
 40 recognized and valued viewing positions has been, or would be, partially
 41 diminished.

- 1 • *VMC 3: Distracting, Visually Co-dominant.* VMC 3 conditions occur where
2 changes in landscape features, their distribution, or sources of lighting have
3 occurred, or may occur in the future, such that the changes compete, or would
4 compete, for attention with the features and lighting inherent to that setting. Or
5 where historically available and scenic views have become, or would become,
6 substantially blocked by past or planned activities, and/or access to recognized
7 and valued viewing positions has been, or would be, substantially diminished.
- 8 • *VMC 4: Visually Dominant.* VMC 4 conditions occur when incongruous changes
9 in landscape features, sources of light and glare, and/or their distribution are, or
10 would be, the focus of attention. Or where historically available and scenic views
11 have become, or would become, totally, or nearly totally, blocked by past or
12 planned activities, and/or recognized and valued viewing positions have become,
13 or would become, inaccessible.

14 In the Project area, the existing visual conditions of importance are limited to the critical
15 public viewing positions identified in Section 24.1.1. As noted, these are located at the
16 San Mateo Avenue crossing, Mendota Pool Park, the Mendota Dam area and the Bass
17 Avenue residential area (Figure 24-1). An overview of the character of the landscape is as
18 follows.

19 *Topographic Features.* Reach 2B is a sandy, meandering river channel flanked by
20 agricultural lands and ending to the west at Mendota Dam. The topography of the Project
21 area and environs contributes little to its character, being flat and presenting no notable
22 natural variations in landforms. The primary effect of the flat terrain is that views can be
23 readily interrupted by even modest vertical features, mostly vegetation, constraining
24 views to the foreground.

25 *Vegetative Features.* Vegetation features are described in Chapter 6.0, “Biological
26 Resources – Vegetation.” From the Chowchilla Bifurcation Structure to the San Mateo
27 Avenue crossing, there is little to no in-channel vegetation. Existing vegetation along the
28 banks of the channel along this stretch consists mostly of riparian scrub and willow scrub
29 communities. The San Joaquin arm of Mendota Pool (from the San Mateo Avenue
30 crossing to Mendota Dam) supports perennial riparian vegetation, mostly willow riparian
31 and cottonwood riparian forest communities with emergent wetland communities. These
32 communities also occur along the banks near Mendota Dam and along the river below the
33 Dam. The forest communities are the most pronounced, visually.



1
2
3

Figure 24-1.
Viewing Positions at the San Mateo Avenue Crossing (Top), Mendota Pool Park
and Vicinity (Middle), and Mendota Dam Area (Bottom)

1 *Water Features.* The Mendota Pool, Mendota Dam, the San Joaquin River below the dam
2 are the most memorable features within the critical public views identified. Mendota
3 Dam and the reservoir it creates, located at the confluence of the San Joaquin River and
4 Fresno Slough, have been features of the landscape for almost 100 years. The first water
5 works in the area, the main canal conveying irrigation water to Los Banos Creek, was
6 built in 1871. Mendota Dam was built in 1917 (San Joaquin River Restoration Program
7 [SJRRP] 2011a). Today, Mendota Dam and Mendota Pool remain an important key to
8 irrigation in the San Joaquin Valley. Associated features of Mendota Dam and Pool
9 include the DMC, which conveys water from the Delta south to Mendota Pool, and
10 several canals which divert water from the Pool for agricultural use.

11 *Cultural Modifications.* The primary features of the landscape—Mendota Dam, Mendota
12 Pool, and the San Joaquin River below the Dam—appear today largely as they have since
13 the original dam was constructed. However, since 1942 when Friant Dam was
14 constructed, up to the beginning of Interim Flows, the San Joaquin River within Reach
15 2B was dry for most of the year. Interim Flows started in October 2009 and Restoration
16 Flows started in January 2014. The existing visual conditions, including Mendota Dam,
17 Mendota Pool, sloughs, canals, and the largely dry river bed, are modifications of the
18 landscape dating as far back as 1871. These features, as well as supporting infrastructure
19 such as roads and utilities, are inherent to a landscape managed for the purposes of
20 agricultural irrigation. They reflect how it was formed, how it functions, and how it is
21 structured. That is, they are not adverse changes to an otherwise natural-appearing
22 landscape.

23 ***San Mateo Avenue Crossing***

24 Access to the crossing is via San Mateo Avenue from the south, across private lands, and
25 from the north via Road 13 and other public roads. Features of the crossing are visible
26 from a limited stretch of Road 13 near the crossing and the crossing itself from public
27 access routes. Views of and from the crossing do not extend far, being constrained by
28 vegetation in the foreground, as shown in the photographs taken from Viewing Position
29 (VP) 1 (Figure 24-2).

30 Prior to Interim Flows (fall 2009), Reach 2B was dry most of the year from the
31 Chowchilla Bifurcation Structure to the San Mateo Crossing, flowing only in response to
32 flood releases from Friant Dam. The crossing, however, marks the approximate limits of
33 the backwater effects of Mendota Pool. From here to points downstream, the river
34 channel is typically inundated. Note that the photograph in Figure 24-2 was taken in
35 August 2010, during a period of Interim Flow.



1
2
3
4

Figure 24-2.
Views of the Riparian Vegetation within the San Joaquin River Channel Looking to the Northwest (Top) and to the East (Bottom), VP 1

1 *Existing Visual Condition: VMC 1, Features Appear Congruent with the Prevailing*
2 *Landscape Character and are Coherently Arrayed.* The visual conditions, as of July
3 2009, are rated as having been VMC 1. As of this date, the area of the immediate crossing
4 was entirely characteristic of a riparian setting along a river the flow regime of which was
5 being managed for sustained deliveries of agricultural irrigation (largely dry river bed).
6 No noticeable adverse changes to this character were in the potentially affected views (no
7 incongruous features). The vegetative types occurred in a natural, random distribution
8 and the river channel evinced a characteristically meandering course (coherently arrayed
9 features). Visual access had been provided by a system of public roads; there was no
10 indication that it had been impaired to any degree due to previous actions. No light
11 sources were observed, nor were there any indications that any had ever been installed in
12 the vicinity; the absence of night lighting is characteristic of the setting, as management
13 of the river for agricultural irrigation requires none.

14 **Mendota Pool Park**

15 The critical public views are those that would include features of the Project or the
16 indirect effects of those features. Within the park, such views occur along a levee that
17 abuts the west shore of the nearby part of Mendota Pool. Figure 24-3 shows views from
18 VPs 2 and 3, both located on or near the levee. For two of the Project alternatives
19 (Alternatives C and D), a dam would be constructed near where Mowry Bridge is today,
20 which is visible from the levee (at VP 2). That view is representative of those from points
21 along approximately 560 feet of the levee between VP 2 and the northeast corner of
22 Mendota Pool Park (VP 5). Just 100 feet to the southeast along Mendota Pool's edge is
23 an area showing obvious signs of use for picnics and fishing (Figure 24-3, lower image,
24 VP 3). Mowry Bridge is not visible from here, so the dam proposed under Alternatives C
25 and D would also not be seen. The view from VP 3 is included to demonstrate the limit to
26 the potential dam's visibility along Mendota Pool's edge.

27 The other views of Mendota Pool Park (shown in Figures 24-4 to 24-7) show the context
28 for the critical public views, including lands to the southeast between the park and
29 Mendota, recreation facilities within the park, and various structures and facilities along
30 its northern edge unrelated to park activities. This context is integral to considerations of
31 the inherent character of the landscape associated with the critical public views directed
32 to the northeast across Mendota Pool. In Figure 24-4 there are two views from VP 4. In
33 the upper image, the outskirts of Mendota are visible at a distance of more than a mile, as
34 is a canal running along the south edge of the park, just visible beyond its bordering
35 levee. The lower image is a view into the interior of the park, showing a covered picnic
36 area and a restroom. Note that both images show that there is directional area lighting
37 attached to the utility poles. It is therefore assumed that there is evening use of the park
38 facilities.

39 Figure 24-5 is a panorama, the lower image continuing the left-to-right view started in the
40 upper image; it discloses the proximity of Mendota Pool to the park facilities.
41 Additionally, the lower image includes a pink building to the right, owned by the U.S.
42 Department of the Interior, Bureau of Reclamation (Reclamation) and utilized by the San
43 Luis Delta Mendota Water Authority. It serves for storage and occasional staging of
44 equipment. The green building to the left is on CCID land leased to the city of Mendota.

1 It is assumed that it is used for equipment storage associated with maintenance of
 2 Mendota Pool Park. The radio tower in view and a 10' by 10' control room building just
 3 visible in line with it are next to the radial gates on the DMC. Together they serve to
 4 remotely operate the adjoining check structure. These structures also appear in Figures
 5 24-6 and 24-7.

6 In Figure 24-6, the upper image (VP 6) shows a close view of the covered picnic facility
 7 and the restroom. More importantly it shows how the levee along Mendota Pool (seen in
 8 the distance beyond the picnic area) blocks sight of Mendota Pool, demonstrating why
 9 views from within the interior of the Park are not directly affected. As noted, though, they
 10 are important as context for views that would disclose Project features.

11 Figure 24-7 shows the views from VP 8 (top image) and VP 9 (bottom image), located
 12 along Bass Avenue from points within and at the edge of the park. The images indicate
 13 the proximity of structures associated with the operation of the DMC noted and how
 14 visible these are from the main access road serving the park.

15 *Existing Visual Condition: VMC 1, Features Appear Congruent with the Prevailing*
 16 *Landscape Character and are Coherently Arrayed.* The existing visual conditions, as of
 17 July 2009, are rated as having been VMC 1. The character of views from points within
 18 the park is defined by features of Mendota Pool, the park itself, and features associated
 19 with the operation of the nearby canals. No noticeable adverse changes to this character
 20 were in the potentially affected views (no incongruous features). As has been noted,
 21 Mendota Pool, sloughs, canals and their related structures (dam, sluice gates, flow
 22 controls) are features created by the management of the San Joaquin River for
 23 agricultural irrigation.

24 In the views shown from VPs 2 and 3 (Figure 24-3) during August 2010, Mendota Pool
 25 was at its normal water surface elevation. Mendota Pool is dewatered by the CCID to
 26 allow standard inspections and maintenance of Mendota Dam.² The CCID has dewatered
 27 Mendota Pool seven times in the last 12 years, typically starting in mid- or late
 28 November. Mendota Pool is typically refilled starting mid-January. Therefore, the views
 29 of Mendota Pool in Figure 24-3 represent its characteristic appearance from early winter
 30 to late fall. A dewatered pool during the interim is also characteristic of Mendota Pool.

31 Features interior to Mendota Pool Park are typical of developed public parks serving
 32 passive and active recreation (Figures 24-4 and 24-6, VPs 4 and 7). They include
 33 playground equipment, picnic tables, a ball field, stage and open areas of lawn, and
 34 storage sheds. However, structures associated with the management of the San Joaquin
 35 River for agricultural purposes—notably those controlling the flow of the nearby
 36 canals—were also in view (Figures 24-5, 24-6 and 24-7, VPs 5, 7 – 9).

² Although recent repairs at Mendota Dam have reduced the need to dewater Mendota Pool for dam inspections



1
2
3

Figure 24-3.
Views to Northeast across Mendota Pool of Mowry Bridge from VP 2 (Top) and from Picnic Site at VP 3 (Bottom)



1
2
3
4

Figure 24-4.
Views from VP4: Looking Southwest across Mendota Pool Park toward Mendota (Top); Looking Northwest into Center of Park (Bottom)



1
2
3
4

Figure 24-5.
Panoramic View Left (Top) to Right (Bottom), Looking Southwest to West from VP 5, at Northeast Corner of Mendota Pool Park



1
2
3
4

Figure 24-6.
View to Northeast from VP 6 Showing Picnic Area, Restroom, and Levee Blocking View of Mendota Pool (Top); View to Northwest from VP 7 of Ball Field, Night Lighting, and Various Utilities in Background (Bottom)



1
2
3
4

Figure 24-7.
Two Views Looking North from Bass Ave. (Top): VP 8, within Mendota Pool Park and (Bottom): VP 9 at North Edge of Park along DMC

1 In summary, types of features ordinarily not congruent with one another are, in the case
 2 of Mendota Pool Park, all inherent to how this landscape was formed, how it functions,
 3 and how it is structured. Because no noticeable adverse changes to the established
 4 character were within the potentially affected views and those related to them (interior
 5 park views) the landscape was “intact” (no incongruous features) as of July 2009. As
 6 well, the park is functionally organized and the shoreline vegetation around Mendota
 7 Pool is arrayed in an expected and natural distribution (coherent distribution of features).
 8 Visual access has been provided by Bass Avenue, a public road, and there are no
 9 indications that access has been impaired to any degree due to past actions.

10 Sources of directional night lighting were evident around the playing fields, roads and
 11 parking area, these being characteristic of a park serving active recreation. Their
 12 operation in the evening was not observed during field observations, so the quality of
 13 lighting was not recorded. However, the lighting, in function, is related to park use and
 14 appeared appropriately sited; it is therefore judged to be both congruent and coherently
 15 arrayed.

16 ***Mendota Dam Area***

17 The Mendota Dam area includes the part of Mendota Pool north of Mowry Bridge,
 18 Mendota Dam, and the area along the river immediately downstream of the dam. Critical
 19 public views occur from Bass Avenue in the vicinity of these features, from along the
 20 west shore north of Mendota Dam, and from along part of the river’s left bank, the latter
 21 starting at a point immediately below the dam at its west end and ending about 425 feet to
 22 the north in unincorporated Fresno County. Sensitivity for these views is treated as
 23 moderate, as noted in Section 24.1.1.

24 Mendota Pool is in the foreground of shore-based views and partially in view from a ¼-
 25 mile of Bass Avenue, starting from a point about 300 feet north of the Helm Canal
 26 crossing and extending 450 feet to a point opposite the west end of Mendota Dam. Figure
 27 24-8 shows the panorama from the east end of Mendota Dam, looking southeast across
 28 part of Mendota Pool, to a stretch of Bass Avenue and a part of the shoreline north of the
 29 dam. A part of Mendota Pool is readily seen from the road and shoreline. From the west
 30 shore of Mendota Pool near Mendota Dam, views extend unimpeded across the water
 31 from the northeast to the south. However, given that Bass Avenue is close in elevation to
 32 Mendota Pool and separated from it by 150 to 250 feet of land, the low oblique views do
 33 not disclose as much of the Pool’s surface as do views from the shore.

34 Mendota Pool is not visible from Bass Avenue north of Mendota Dam’s west end. From
 35 this point, though, Mendota Dam and the San Joaquin River come into view from the
 36 road for about 1,000 feet. These are mobile views lasting cumulatively for about 22
 37 seconds at a driving speed of 45 miles per hour. Note that for recreationists these views
 38 are repetitive, occurring numerous times during the year; for the residents at the end of
 39 Bass Avenue, the views occur daily. Those from the west bank of Mendota Pool and the
 40 west bank of the river below Mendota Dam, however, are stationary, affording a
 41 maximum degree of attention to detail.

1 Figures 24-9 and 24-10 present views from three points along Bass Avenue. The
2 panorama in Figure 24-9 is directed northwest to northeast along the road from VP 11,
3 close to Mendota Dam's west end. Agricultural lands typical of the Project area flank the
4 road along its west-northwest side, while the San Joaquin River lines the road on its east-
5 northeast side. This view occurs for those travelling north on Bass Avenue. Figure 24-10
6 shows the views from VP 12 (top) and VP 13 (bottom), both of which include the river
7 and the part of Mendota Dam which would be modified under the two Fresno Slough
8 Dam alternatives (Alternative C and D). These views represent those along about 220 feet
9 of the road for residents driving south from the group of four homes at the road's north
10 end.

11 Figure 24-11 presents the views from VPs 14 and 15, located along the west shore of the
12 river below the Mendota Dam in an area on private property that experiences some
13 recreation use including fishing, picnicking, swimming, boating, and, downstream from
14 here, hunting. The upper image shows a close view of the potentially modified part of
15 Mendota Dam (VP 14). The lower image is the downstream view from VP 15 (the
16 location for potential fish passage facilities); Mendota Dam is a few feet from this point
17 and readily in view, as well.

18 *Existing Visual Condition: VMC 1, Features Appear Congruent with the Prevailing*
19 *Landscape Character and are Coherently Arrayed.* The existing visual conditions, as of
20 July 2009, are rated as having been VMC 1. As of that date, Mendota Pool and the San
21 Joaquin River below Mendota Dam would have been similar in appearance to views from
22 August 2011 (Figures 24-8 to 24-11).

23 The Project area in view from Bass Avenue is at the interface between two character
24 types—an agricultural landscape to the west, and abutting it to the east a river system
25 engineered for agricultural irrigation resulting in an artificial body of water (Mendota
26 Pool), Mendota Dam, canals, and supporting infrastructure. Because of the dependence of
27 agricultural production on the delivery of irrigation water, the function, structure and
28 patterns of development of one are interrelated with those of the other, and the two
29 character types are therefore compatible.

30 The character of the potentially affected views is defined primarily by Mendota Dam, and
31 the water surfaces of Mendota Pool and the San Joaquin River. Tall riparian vegetation
32 along the river defines the skyline and clearly marks the river's course, even at a distance,
33 as shown in the upper image in Figure 24-9. Also important visually are the canals and
34 levees in the foreground of views from Bass Avenue, laid out in angular counterpoint to
35 the sinuous river course nearby (Figure 24-9). The character of the potentially affected
36 lands and that of the nearby agricultural area have remained intact for many decades; no
37 adverse changes to the features of the landscape due to past actions were apparent during
38 field investigations (no changes incongruous with the established setting). The features
39 within the agricultural lands and their distribution—fields, barns, silos, farm houses,
40 windbreaks—exactly express their function and structure and pattern of development.



1
2
3
4

Figure 24-8.
Panoramic View Looking Southeast, Left (Top) Continuing to Right (Bottom), across Mendota Pool from Mendota Dam,
VP 10



1
2
3

Figure 24-9.
Panoramic View Looking Northwest to Northeast, Left (Top) Continuing to Right (Bottom), along Bass Ave. from VP 11



1
2
3

Figure 24-10.
Views of the San Joaquin River Looking South from Bass Ave., VP 12 (Top) and VP 13 (Bottom)



1
2
3
4

Figure 24-11.
Views across San Joaquin River from Area below Mendota Dam: Facing Southeast toward Dam, VP 14 (Top); Facing Northeast Downstream, VP 15 (Bottom)

1 ***Bass Avenue Residential Area***

2 The Bass Avenue residential area comprises four homes at the north end of Bass Avenue.
3 Views from these residences include screening vegetation lining the southeast side of
4 Bass Avenue, opposite these homes (Figure 24-12). There is a limited view of the river
5 from the north end of Bass Avenue at a point less than 200 feet from the homes. At flood
6 stage, the San Joaquin River would be readily seen from here. As of the July 2009,
7 though, the river would have been at a much lower level, similar to what is shown in
8 Figure 24-13, lower image, and not appreciably visible.

9 Views from Bass Avenue are important to the residents of the four homes since this road
10 provides their only access route. They have repetitive—if short-duration—views that
11 include Mendota Dam, the river, and Mendota Pool. The road-based views have low
12 sensitivity, due to the limited number of homes in the area—and the low exposure to the
13 features of the river. Changes to the dam and associated construction activity would be in
14 the background, as would changes to Mendota Pool area behind the dam due to the
15 potential construction of a dam near Mowry Bridge.

16 *Existing Visual Condition: VMC 1, Features Appear Congruent with the Prevailing*
17 *Landscape Character and are Coherently Arrayed.* The existing visual conditions of
18 views from Bass Avenue, as of July 2009, are rated as having been VMC 1. Refer to the
19 assessment of the Mendota Dam area views for the details of the assessment of these
20 visual conditions.



1
2
3

Figure 24-12.

Panoramic View of Bass Ave. Residences from VP 13, Looking Southwest to West, Left (Top) Continuing to Right (Bottom)



1
2
3

Figure 24-13.
Views from and near Gate at North End of Bass Ave., Looking North (Top) and Northeast (Bottom)

1 **24.2 Regulatory Setting**

2 The regulatory setting, as it pertains to visual resources, is comprised of public policies,
3 objectives, and supporting laws, ordinances, regulations, or standards which serve to
4 protect and preserve the quality of visual resources and/or physical access to views of
5 those resources. Of importance is whether potential impacts would be inconsistent with
6 the regulatory setting.

7 **24.2.1 Federal**

8 The National Scenic Byways Program was established under the Intermodal Surface
9 Transportation Efficiency Act of 1991 and reauthorized in 1998 under the Transportation
10 Equity Act for the 21st Century. Under the program, the U.S. Secretary of Transportation
11 recognizes certain roads as National Scenic Byways or All-American Roads based on
12 their archaeological, cultural, historic, natural, recreational, and scenic qualities.
13 However, the National Scenic Byways Program highlights no roads within or near the
14 Project area.

15 **24.2.2 State of California**

16 California's Scenic Highway Program was created by the California Legislature in 1963.
17 Its purpose is to protect and enhance the natural scenic beauty of California highways and
18 adjacent corridors through special conservation treatment. No officially designated State
19 scenic highways are located in the Project area.

20 **24.2.3 Regional and Local**

21 This section discusses regional and local plans and policies relating to visual resources.

22 ***Madera County General Plan***

23 Policies relating to scenic/visual resources are found in the Madera County General Plan
24 (1995). Three policies are potentially applicable to the Project or its alternatives as
25 follows:

- 26 • *Section 1, Land Use, Subsection H. Visual and Scenic Resources, Policy 1.H.1:*
27 The County shall require new development in scenic rural areas to avoid locating
28 structures along ridgelines, on steep slopes, or in other highly visible locations
29 except if the location is required to avoid hazards or design and screening
30 measures are incorporated to minimize the visibility of the structures and graded
31 areas.
- 32 • *Section 5, Agricultural and Natural Resources, Sub-section C. Water Resources,*
33 *Policy 5.C.6:* This policy requires that natural watercourses be integrated into new
34 development such that they are accessible to the public and provide a positive
35 visual element.
- 36 • *Section 6, Health and Safety, Subsection B. Flood Hazards, Policy 6.8.5:* Policy
37 6.8.5 requires flood control structures, facilities and improvements to be designed
38 to preserve scenic values.

1 **Fresno County Master Plan**

2 Policies relating to scenic/visual resources are found in the Fresno County General Plan
3 (Fresno County 2000). Of these visual/scenic resource-related policies, one is potentially
4 applicable to the Project or its alternatives as follows:

- 5 • *Open Space and Conservation Element, Water Resources, Policy OS-A.18:* This
6 policy is the same as the Madera County General Plan Water Resources Policy
7 5.C.6, which requires that natural watercourses be integrated into new
8 development such that they are accessible to the public and provide a positive
9 visual element.

10 Other policies of the Madera and Fresno County General Plans reference scenic/visual
11 resource protection but are not included in the Regulatory Setting because the policies:

- 12 • Apply to land uses, such as rangelands, industrial, commercial and residential
13 development, either not occurring within the Project area or not occurring within
14 critical public views that include the Project area.
- 15 • Apply to plans not pertaining to the immediate Project area.
- 16 • Apply to resources, conditions, geographical features, or facilities not found
17 within the Project area or, if within the area, are not within critical public views of
18 the Project or its alternatives. These would include, for instance, forest and
19 mineral resources; oak woodlands; hillsides and ridges; designated scenic drives,
20 roads, highways or their corridors; and designated scenic views, panoramas and
21 vistas.
- 22 • Are general statements of the County’s intentions to preserve/protect visual/scenic
23 resources and what the County *should* do, methods to be applied, studies to be
24 conducted, resource maps to be developed, and priorities established. These
25 include statements such as: “The County should require development adjacent to
26 scenic areas...to incorporate natural features of the site...to minimize impacts to
27 the scenic qualities of the site (Fresno County General Plan Open Space and
28 Conservation Element, Subsection K. Scenic Resources: Policy OS-K.4).

29 **San Joaquin River Parkway Master Plan**

30 The Program Environmental Impact Statement/Report (PEIS/R) references the San
31 Joaquin River Parkway Master Plan as a relevant part of the regulatory setting (SJRRP
32 2011b, page 25-6). This is a conceptual, long-range planning document intended to help
33 preserve, enhance, and provide for enjoyment of the natural landscape of the San Joaquin
34 River corridor. As proposed in 1992, the parkway would include the San Joaquin River
35 and approximately 5,900 acres of land on both sides of the river between Friant Dam and
36 the State Route (SR) 99 crossing, as well as the existing 17-acre Skaggs Bridge Park at
37 the SR 145 crossing. This park, however, is more than 13 miles east of the Chowchilla
38 Bifurcation Structure, the easternmost part of the Project area. The Plan, therefore, does
39 not apply to the Project or its alternatives.

1 **24.3 Environmental Consequences and Mitigation Measures**

2 **24.3.1 Impact Assessment Methodology**

3 The aesthetic and visual resources assessment compares public views of the existing
4 condition of aesthetics resources to the conditions anticipated from implementing any of
5 the Project alternatives. A review of literature and maps, an inspection of the Project site
6 and the potentially affected environs served to identify these public views. The analysis
7 uses information contained in the PEIS/R and site visit information to determine whether
8 construction and operation of the Project alternatives would directly impact aesthetics
9 and visual resources.

10 The visual resources assessment focused on identifying visual impacts, their intensity,
11 and whether they would be significant. The VMC approach conforms to the
12 documentation requirements of the National Environmental Policy Act (NEPA) and the
13 California Environmental Quality Act (CEQA) and closely follows the concepts and
14 principles of Federal visual analysis methodologies. Steps in the VMC approach to visual
15 impact assessment are summarized as follows:

- 16 • Identify critical public views potentially affected by the Project (e.g., legally
17 protected views, designated areas of interest, sites of cultural/religious
18 importance, scenic highways, and residential areas).
- 19 • Identify any Federal, State, county, and local laws, ordinances, regulations, and
20 standards, as well as planning policies and objectives, that expressly protect or
21 recognize the value of specific public views or view corridors.
- 22 • Describe the existing visual conditions of those potentially affected critical public
23 views.
- 24 • Estimate the intensity of possible adverse visual impacts on those views.
- 25 • Evaluate the significance of the possible impacts (the relationship of impact
26 intensity to public sensitivity).
- 27 • As applicable, consider possible mitigation measures that could lessen the impacts
28 to a level of intensity that is less than significant.

29 **24.3.2 Significance Criteria**

30 The Project is evaluated in accordance with the aesthetics section of Appendix G of the
31 State CEQA Guidelines. Under NEPA Council on Environmental Quality regulations,
32 effects must be evaluated in terms of their context and intensity. These factors were
33 considered when applying State CEQA guidelines Appendix G. Implementation of the
34 Project could result in potentially significant impacts to visual quality and aesthetics if
35 the Project would result in any of the following:

- 36 • Have a substantial adverse effect on a scenic vista.
- 37 • Substantially damage scenic resources, including, but not limited to, trees, rock
38 outcroppings, and historic buildings within a State scenic highway.

- 1 • Substantially degrade the existing visual character or quality of the site and its
- 2 surroundings.
- 3 • Create a new source of substantial light or glare which would adversely affect day
- 4 or nighttime views in the area.

5 A perceptible reduction in visual quality generally must persist for a year or more before
 6 being treated as a significant impact. Also, an adverse visual impact may be significant if
 7 it is inconsistent with laws, ordinances, regulations, and standards, whether or not it
 8 meets other significance criteria; the impact, however, generally must be estimated to last
 9 more than 1 year.

10 **24.3.3 Impacts and Mitigation Measures**

11 This section provides an evaluation of direct and indirect effects of the Project
 12 Alternatives on visual resources. It includes analysis of potential effects relative to the
 13 No-Action Alternative in accordance with NEPA and potential impacts compared to
 14 existing conditions to meet CEQA requirements. The analysis is organized by Project
 15 alternative with specific impact topics numbered sequentially under each alternative.
 16 With respect to visual resources, the environmental impact issues and concerns are:

- 17 1. Construction Related Effects on the Visual Quality of the Project Site and Its
- 18 Surroundings.
- 19 2. Long-term Changes in the Visual Character or Quality of the San Mateo Avenue
- 20 Crossing.
- 21 3. Long-term Changes in the Visual Character or Quality of the Mendota Pool Park
- 22 Area.
- 23 4. Long-term Changes in the Visual Character or Quality of the Mendota Dam Area.
- 24 5. Long-term Changes in the Visual Character or Quality of the Bass Avenue
- 25 Residential Area.
- 26 6. Substantial Changes in Light or Glare.

27 Other visual resources related issues covered in the PEIS/R are not covered here because
 28 they are programmatic in nature and/or are not relevant to the Project area.

29 ***Issues Eliminated from Further Analysis***

30 There are no scenic highways or designated scenic vistas in the Project area, therefore
 31 views from scenic highways and scenic vistas would not be affected by the Project
 32 alternatives and will not be discussed further.

33 ***No-Action Alternative***

34 Under the No-Action Alternative the Project would not be implemented and none of the
 35 Project features would be developed in Reach 2B of the San Joaquin River. However,
 36 other proposed actions under the SJRRP would be implemented including habitat
 37 restoration, augmentation of river flows, and reintroduction of salmon. Without the
 38 Project in Reach 2B, however, these activities would not achieve the Settlement goals.

1 The potential effects of the No-Action Alternative are described below. The analysis is a
2 comparison to existing conditions, and no mitigation is required for No-Action.

3 **Impact VIS-1 (No-Action Alternative): *Construction Related Effects on the Visual***
4 ***Quality of the Project Site and Its Surroundings.*** Under the No-Action Alternative, no
5 construction related activities would take place in the Project area, as the Project would
6 not be implemented. As a result there would be **no impact** on existing visual resources
7 resulting from construction of the Project.

8 **Impact VIS-2 (No-Action Alternative): *Long-term Changes in the Visual Character***
9 ***or Quality of the San Mateo Avenue Crossing.*** Under the No-Action Alternative, none
10 of the proposed facilities that are part of the Project would be developed. However,
11 Program-level improvements would still occur that could lead to improvements in
12 riverine habitat, and as such an improvement in existing visual conditions as compared to
13 existing conditions. Increased flows in the San Joaquin River would improve the health
14 of the aquatic ecosystem that would potentially improve visual conditions in the San
15 Mateo Avenue area by increasing riparian habitat. Therefore, the No-Action Alternative
16 would create a **beneficial** effect on the existing visual character.

17 **Impact VIS-3 (No-Action Alternative): *Long-term Changes in the Visual Character***
18 ***or Quality of the Mendota Pool Park Area.*** Under the No-Action Alternative, the timing
19 and/or duration of Restoration Flows would increase through Mendota Pool; however the
20 visual characteristics of the Pool including water surface elevation and habitat would
21 likely remain the same as compared to existing conditions. Furthermore, there would be
22 little, if any, changes to visual resources in the Fresno Slough arm of Mendota Pool.
23 Therefore there would be **no impact** to the visual character of the Mendota Pool Park
24 area.

25 **Impact VIS-4 (No-Action Alternative): *Long-term Changes in the Visual Character***
26 ***or Quality of the Mendota Dam Area.*** Refer to VIS-3 (No-Action Alternative); the same
27 impacts would occur here. There would be more flow over the dam, but effects to visual
28 resources would be consistent with existing conditions. Therefore there would be **no**
29 **impact** to the visual character of the Mendota Dam area.

30 **Impact VIS-5 (No-Action Alternative): *Long-term Changes in the Visual Character***
31 ***or Quality of the Bass Avenue Residential Area.*** Refer to VIS-3 (No-Action
32 Alternative); the same impacts would occur here. There would be more flow below the
33 dam, but effects to visual resources would be consistent with existing conditions.
34 Therefore there would be **no impact** to the visual character of the Bass Avenue
35 residential area.

36 **Impact VIS-6 (Alternative): *Substantial Changes in Light or Glare.*** The No-Action
37 Alternative would not create a new source of substantial light or glare that would affect
38 daytime or nighttime views in the Project area. As a result there would be **no impact** on
39 existing visual resources resulting from changes in light or glare.

1 **Alternative A (Compact Bypass with Narrow Floodplain and South Canal)**

2 Alternative A would include construction of Project facilities including a Compact
3 Bypass channel, a levee system encompassing the river channel with a narrow floodplain,
4 and the South Canal. Other key features include construction of the Mendota Pool dike
5 (separating the San Joaquin River and Mendota Pool), a fish barrier below Mendota Dam,
6 and the South Canal bifurcation structure with fish passage facility and fish screen,
7 modification of the San Mateo crossing, and the removal of the San Joaquin River control
8 structure at the Chowchilla Bifurcation Structure. Construction activity is expected to
9 occur intermittently over an approximate 132-month timeframe.

10 **Impact VIS-1 (Alternative A): Construction Related Effects on the Visual Quality of**
11 **the Project Site and Its Surroundings.** Compared to the No-Action Alternative,
12 implementation of Alternative A has the potential to result in short-term impacts on
13 visual resources from construction activities from nearby public view points.

14 As previously discussed in Section 24.1.1, visual access to the Project area is limited. The
15 majority of the Project area is bordered by private lands and roads. The existing visual
16 conditions of importance are limited to the critical public viewing positions identified in
17 Section 24.1.1. As noted, these are located at the San Mateo Avenue crossing, Mendota
18 Pool Park, the Mendota Dam area, and Bass Avenue (Figure 24-1). Public views of the
19 San Joaquin River portion of the Project area upstream of Mendota Pool are only
20 available from the San Mateo Avenue crossing.

21 Downstream of Mendota Dam, the river is seen from public viewing positions along the
22 river and near Mendota Dam. These include the below-Dam informal recreation site and
23 points along Bass Avenue. Part of Mendota Pool can be seen from Mendota Pool Park,
24 although it is more visible from public viewpoints along Bass Avenue and in the vicinity
25 of Mendota Dam. Sensitive receptors are recreationist users of Mendota Pool, Mendota
26 Pool Park, as well as motorists traveling along Bass Avenue.

27 Construction activities under Alternative A could take place at any time during the year
28 and could reduce the aesthetic qualities of views in the Project area by introducing earth
29 moving equipment and other construction equipment, materials and work crews into the
30 viewshed. General construction activities may include excavation, earth movement,
31 construction of a new road crossing, construction of new levees, water diversion for
32 building of in-stream facilities, construction of new canals, and construction of control
33 structures, fish passage facilities, and fish screens. Further, the presence and movement of
34 heavy construction equipment and potential construction-related generation of dust could
35 temporarily degrade the existing visual character of the area. Recreationists' views of
36 construction would largely be blocked by intervening vegetation and topography.
37 Agricultural workers would have longer views of construction areas than recreationists
38 because they are present longer, but this group is not considered a sensitive viewer group.
39 Motorists would have limited and short duration views of the area while traveling along
40 Bass Avenue. Construction activities would impact the visual character from sensitive
41 viewpoints, as construction schedule dictates, on a periodic and limited basis over the
42 132-month construction period.

1 When comparing Alternative A to existing conditions, impacts to visual resources would
2 be similar to those discussed in the preceding paragraphs (i.e., the comparison of
3 Alternative A to No-Action). Due to construction activities, the visual quality and
4 character of the Project area vistas would diminish. Based on the sensitivity of
5 viewpoints, high exposure to the Project, and the multi-year time frame of construction,
6 impacts on visual resources would be **potentially significant**.

7 **Mitigation Measure VIS-1 (Alternative A): *Minimize Visual Disruption from***
8 ***Construction Activities***. The construction contractor will be required to adhere to the
9 following construction requirements regarding construction-related visual/aesthetic
10 disruption. The impact would be **less than significant** after mitigation.

11 **Implementation Action:** Minimize construction related impacts on visual
12 resources by including requirements in the contract with the construction
13 company. In order to minimize visual disruption, the construction contractor will
14 be required to implement the following:

- 15 - When possible, preserve existing vegetation, particularly vegetation along the
16 edge of construction areas that may help screen views.
- 17 - After construction, regrade areas located outside of the floodplain that were
18 disturbed by construction, staging, and storage to original contours where
19 feasible, and revegetate with plant material similar in replacement numbers
20 and types to that which was removed based upon local jurisdictional
21 requirements. If there are no local jurisdictional requirements, replace
22 removed vegetation at a 1:1 replacement ratio for shrubs and small trees, and
23 2:1 replacement ratio for mature trees.
- 24 - To the extent feasible, do not locate construction staging sites within the
25 immediate foreground distance (0 to 500 feet) of existing residential,
26 recreational, or other high-sensitivity receptors. Where such siting is
27 unavoidable, staging sites will be screened from sensitive receptors using
28 appropriate solid screening materials such as temporary fencing and walls.

29 **Location:** The location of proposed construction area modifications will vary as
30 construction activities move throughout the Project area but will be focused
31 primarily at Mendota Pool Park and San Mateo Avenue. Fencing will be
32 implemented where topography and Project area activities allow.

33 **Effectiveness Criteria:** Effectiveness will be based on public complaints to the
34 SJRRP.

35 **Responsible Agency:** Reclamation, CSLC, and the contractor.

36 **Monitoring/Reporting Action:** Adequacy of the proposed construction practices
37 will be confirmed with Reclamation construction managers and CSLC monitors.

38 **Timing:** Mitigation will be ongoing over the construction timeframe.

1 **Impact VIS-2 (Alternative A): Long-term Changes in the Visual Character or Quality**
 2 **of the San Mateo Avenue Crossing.** Compared with the No-Action Alternative,
 3 Alternative A proposes new facilities that would impact the existing visual character and
 4 quality of the Project area at critical public viewpoints including the San Mateo Avenue
 5 crossing. Potential visual impacts for the public viewpoint at the San Mateo Avenue
 6 crossing are described below based on their sensitivity, Project exposure and visual
 7 modification class.

- 8 • *Sensitivity: Low.*
- 9 • *Project Exposure: High.*
- 10 • *Existing Visual Condition: VMC 1, Features Appear Congruent with the*
 11 *Prevailing Landscape Character and are Coherently Arrayed.*

12 In contrast to the No-Action Alternative, improvements to the San Mateo River crossing
 13 under Alternative A include installing a low flow or dip crossing with multiple, counter-
 14 sunk concrete box culverts designed for highway loading. Armoring is included along the
 15 entrance and exit of the structure as well as along the channel banks in the immediate
 16 vicinity of the structure. Culverts would be embedded below the existing channel bed.
 17 Grouted riprap would be placed in the culvert below the existing channel bed to prevent
 18 channel scour reaching the floor of the culvert and to create a roughened boundary layer
 19 for fish passage. Native bed material would be placed above the grouted riprap up to the
 20 existing channel bed elevation to provide passage conditions similar to that which exists
 21 in the adjacent natural stream (see Section 2.2.5). These improvements would be
 22 congruent with the existing character and quality of the San Mateo crossing. At certain
 23 flows the crossing would be overtopped, and it would mirror existing conditions.
 24 Improvements in the crossing, the placement of native bed material above grouted riprap,
 25 and the improvements to the channel bed and riparian vegetation would have a beneficial
 26 effect on visual resources at the San Mateo Avenue crossing.

27 When comparing Alternative A to existing conditions, impacts to visual resources would
 28 be similar to those discussed in the preceding paragraphs (i.e., the comparison of
 29 Alternative A to No-Action). Based on the existing conditions and the proposed
 30 improvements the effects on visual resources are considered **beneficial**.

31 **Impact VIS-3 (Alternative A): Long-term Changes in the Visual Character or Quality**
 32 **of the Mendota Pool Park Area.** Potential visual impacts for the public viewpoint at
 33 Mendota Pool Park are described below based on sensitivity, Project exposure and visual
 34 modification class.

- 35 • *Sensitivity: High.*
- 36 • *Project Exposure: Low.*
- 37 • *Existing Visual Condition: VMC 1, Features Appear Congruent with the*
 38 *Prevailing Landscape Character and are Coherently Arrayed.*

39 Under Alternative A, no construction would occur near Mendota Pool Park. As noted in
 40 Section 24.1.1, the park users would regularly experience views of existing levees and

1 water infrastructure, and expect views of agricultural and rural character. Compared to
2 the No-Action Alternative, these views in the Fresno Slough arm of Mendota Pool would
3 be unchanged.

4 When comparing Alternative A to existing conditions, impacts to visual resources would
5 be similar to those discussed in the preceding paragraphs (i.e., the comparison of
6 Alternative A to No-Action). There would be **no impact** on visual resources at Mendota
7 Pool Park.

8 **Impact VIS-4 (Alternative A): Long-term Changes in the Visual Character or Quality**
9 **of the Mendota Dam Area.** Potential visual impacts for the public viewpoints in the
10 Mendota Dam area are described below based on sensitivity, Project exposure and visual
11 modification class.

- 12 • *Sensitivity: Moderate.*
- 13 • *Project Exposure: Low.*
- 14 • *Existing Visual Condition: VMCI, Features Appear Congruent with the*
15 *Prevailing Landscape Character and are Coherently Arrayed.*

16 Under Alternative A, no construction would occur at or near the Mendota Dam area. The
17 character of the potentially affected views in the Mendota dam area is defined primarily
18 by Mendota Dam, the water surfaces of Mendota Pool and the San Joaquin River. Critical
19 public views of Mendota Dam or from Mendota Dam are not changed by Alternative A;
20 therefore the visual character of the Mendota Pool area would remain congruent in terms
21 of mass, color, line and form. Compared to the No-Action Alternative, critical public
22 views in the Mendota Dam area would be unchanged.

23 When comparing Alternative A to existing conditions, impacts to visual resources would
24 be similar to those discussed in the preceding paragraphs (i.e., the comparison of
25 Alternative A to No-Action). There would be **no impact** on visual resources in the
26 Mendota Dam area.

27 **Impact VIS-5 (Alternative A): Long-term Changes in the Visual Character or Quality**
28 **of the Bass Avenue Residential Area.** Potential visual impacts for the public viewpoint at
29 the Bass Avenue residential area are described below based on sensitivity, Project
30 exposure and visual modification class.

- 31 • *Sensitivity: Low.*
- 32 • *Project Exposure: Low.*
- 33 • *Existing Visual Condition: VMCI, Features Appear Congruent with the*
34 *Prevailing Landscape Character and are Coherently Arrayed.*

35 In contrast to the No-Action Alternative, the levee along Reach 3 adjacent the Bass
36 Avenue residential area would be improved. The character of the potentially affected
37 views in the Bass Avenue residential area is defined primarily by the existing levee and
38 vegetation along the San Joaquin River. Existing vegetation may be removed to make the

1 levee improvements and large woody vegetation, such as trees and shrubs, on the levee
 2 itself would not be replaced after the improvements due to implementation of more
 3 rigorous maintenance standards for new levees. However, trees and shrubs within the San
 4 Joaquin River floodplain inside the levee is expected to remain and improve with
 5 increased flows; therefore the visual character of the Bass Avenue residential area would
 6 only slightly modify the color, line and form of the visual resources, as it would replace
 7 or enhance the existing levee and trees and shrubs located within the new levees are
 8 expected to improve under Alternative A.

9 When comparing Alternative A to existing conditions, impacts to visual resources would
 10 be similar to those discussed in the preceding paragraphs (i.e., the comparison of
 11 Alternative A to No-Action). Based on the existing conditions and the proposed
 12 improvements, the impacts on visual resources are considered **less than significant** in the
 13 Bass Avenue residential area.

14 **Impact VIS-6 (Alternative A): *Substantial Changes in Light or Glare.*** Compared to
 15 the No-Action Alternative, construction activities may introduce new sources of
 16 nighttime light or glare under Alternative A. For example, equipment staging areas and
 17 construction areas may be temporarily lit at night during the construction period.
 18 Although views of the construction areas from nearby residences would be largely
 19 obscured by intervening distance, topography, and/or vegetation, construction activities
 20 could cause a noticeable change light or glare at some locations. Nighttime lighting
 21 related to construction would be temporary or short term.

22 When comparing Alternative A to existing conditions, impacts to visual resources would
 23 be similar to those discussed in the preceding paragraph (i.e., the comparison of
 24 Alternative A to No-Action). Impacts on visual resources from changes in light and glare
 25 are considered **potentially significant**.

26 **Mitigation Measure VIS-6 (Alternative A): *Require Conformance to Lighting***
 27 ***Standards.*** Project proponents will conform to the guidelines described below to reduce
 28 impacts associated with light and glare during the construction phase. The impact after
 29 mitigation would be **less than significant**.

30 **Implementation Action:** Minimize construction related impacts on visual
 31 resources by including requirements in the contract with the construction
 32 contractor.

- 33 – If construction lighting is needed, contractors will be required to shield
 34 lighting and direct lights downward onto the work site.
- 35 – Meet the minimum county lighting standards for all Project-related lighting.
 36 All lighting fixtures will be designed to be consistent with the guidelines
 37 contained in the applicable county general plan.
- 38 – Shield or screen lighting fixtures to direct the light downward and prevent
 39 light from spilling on adjacent properties.

- 1 – Prohibit the use of harsh mercury vapor, low-pressure sodium, or fluorescent
2 bulbs.
- 3 – Consider design features, namely directional shielding for all substantial light
4 sources, that will reduce effects of nighttime lighting. In addition, consider the
5 use of automatic shutoffs or motion sensors for lighting features to further
6 reduce excess nighttime light. All nighttime lighting will be shielded to
7 prevent the light from shining off the surface intended to be illuminated.

8 **Location:** The location of proposed construction area modifications will vary as
9 construction activities move throughout the Project area but will be focused
10 primarily at the Mendota Dam area and the Bass Avenue residential area.

11 **Effectiveness Criteria:** Effectiveness will be based on public complaints to the
12 SJRRP.

13 **Responsible Agency:** Reclamation, CSLC, and the contractor.

14 **Monitoring/Reporting Action:** Adequacy of the proposed construction practices
15 will be confirmed with Reclamation construction managers and CSLC monitors.

16 **Timing:** Mitigation will be ongoing over the construction timeframe.

17 ***Alternative B (Compact Bypass with Consensus-Based Floodplain and Bifurcation***
18 ***Structure), the Preferred Alternative***

19 Alternative B would include construction of Project features including a Compact Bypass
20 channel, a levee system with a wide, consensus-based floodplain encompassing the river
21 channel, and the Compact Bypass Bifurcation Structure with fish passage facility and fish
22 screen. Other key features include construction of a fish passage facility at the
23 Chowchilla Bifurcation Structure, the re-route of Drive 10 ½ (across the Compact Bypass
24 Control Structure), and removal of San Mateo crossing. Construction activity is expected
25 to occur intermittently over an approximate 157-month timeframe.

26 **Impact VIS-1 (Alternative B): *Construction Related Effects on the Visual Quality of***
27 ***the Project Site and Its Surroundings.*** Compared to the No-Action Alternative,
28 implementation of Alternative B has the potential to result in short and long-term impacts
29 on visual resources near construction activities from public view points. Under
30 Alternative B construction related effects on visual impacts would generally be the same
31 as those described for Alternative A with one exception. Project construction would take
32 place over a longer time frame, 157 months; therefore construction would impact visual
33 resources in these areas for a longer duration. Construction activities would be similar in
34 scope and impacts as the ones discussed in Impact VIS-1 (Alternative A).

35 When comparing Alternative B to existing conditions, impacts to visual resources would
36 be similar to those discussed in the preceding paragraph (i.e., the comparison of
37 Alternative B to No-Action). Because these impacts would occur intermittently within the
38 overall construction time frame for the entire project, they are considered **potentially**
39 **significant.**

1 **Mitigation Measure VIS-1 (Alternative B): *Minimize Visual Disruption from***
 2 ***Construction Activities.*** Refer to Mitigation Measure VIS-1 (Alternative A). The same
 3 mitigation measure would be used under Alternative B as under Alternative A. The
 4 impact after mitigation would be **less than significant**.

5 **Impact VIS-2 (Alternative B): *Long-term Changes in the Visual Character or Quality***
 6 ***of the San Mateo Avenue Crossing.*** Compared with No-Action Alternative, Alternative
 7 B would remove the existing culvert at the San Mateo Avenue crossing, which would
 8 change the visual character and quality at the crossing by restoring a continuous river
 9 channel and improving the overall natural character. The wider floodplain would not
 10 substantially affect the quality and character of visual conditions at this public view point.

11 When comparing Alternative B to existing conditions, impacts to visual resources would
 12 be similar to those discussed in the preceding paragraph (i.e., the comparison of
 13 Alternative B to No-Action). Based on the existing conditions and the proposed removal
 14 of the culvert, the effects on visual resources are considered **beneficial**.

15 **Impact VIS-3 (Alternative B): *Long-term Changes in the Visual Character or Quality***
 16 ***of the Mendota Pool Park Area.*** Refer to Impact VIS-3 (Alternative A). Potential
 17 impacts of Alternative B would be the same as potential impacts of Alternative A. There
 18 would be **no impact** on visual resources at Mendota Pool Park.

19 **Impact VIS-4 (Alternative B): *Long-term Changes in the Visual Character or Quality***
 20 ***of the Mendota Dam Area.*** Refer to Impact VIS-4 (Alternative A). Potential impacts of
 21 Alternative B would be the same as potential impacts of Alternative A. There would be
 22 **no impact** on visual resources in the Mendota Dam area.

23 **Impact VIS-5 (Alternative B): *Long-term Changes in the Visual Character or Quality***
 24 ***of the Bass Avenue Residential Area.*** Refer to Impact VIS-5 (Alternative A). Potential
 25 impacts of Alternative B would be the same as potential impacts of Alternative A.
 26 Impacts on visual resources are considered **less than significant** in the Bass Avenue
 27 residential area.

28 **Impact VIS-6 (Alternative B): *Substantial Changes in Light or Glare.*** Refer to Impact
 29 VIS-6 (Alternative A). Potential impacts of Alternative B would be the same as potential
 30 impacts of Alternative A. Impacts on visual resources from changes in light and glare are
 31 considered **potentially significant**.

32 **Mitigation Measure VIS-6 (Alternative B): *Require Conformance to Lighting***
 33 ***Standards.*** Refer to Mitigation Measure VIS-6 (Alternative A). The same mitigation
 34 measures would be used under Alternative B as under Alternative A. The impact after
 35 mitigation would be **less than significant**.

36 ***Alternative C (Fresno Slough Dam with Narrow Floodplain and Short Canal)***
 37 Alternative C would include construction of Project features including Fresno Slough
 38 Dam, a levee system with a narrow floodplain encompassing the river channel, and the
 39 Short Canal. Other key features include construction of the Mendota Dam fish passage
 40 facility, the Fresno Slough fish barrier, the Short Canal control structure and fish screen,

1 the Chowchilla Bifurcation Structure fish passage facility, modification of San Mateo
2 crossing, and Main Canal and Helm Ditch relocations. Construction activity is expected
3 to occur intermittently over an approximate 133-month timeframe.

4 **Impact VIS-1 (Alternative C): *Construction Related Effects on the Visual Quality of***
5 ***the Project Site and Its Surroundings.*** Compared to the No-Action Alternative,
6 implementation of Alternative C has the potential to result in short-term impacts on
7 visual resources near construction activities from public view points. Construction related
8 activities would generally be the same as those described for Alternative A, with several
9 exceptions. Unlike Alternative A, construction activities in Alternative C would be more
10 concentrated in the Mendota Pool and Fresno Slough areas, where new fish passage and
11 dam facilities are proposed. As a result impacts to viewpoints like the informal paths on
12 the levee tops, bordering Mendota Pool Park would be greater under Alternative C than
13 Alternative A. The construction impacts related to building Fresno Slough Dam would
14 adversely affect viewsheds of informal paths users at Mendota Pool Park. Construction
15 equipment, workers and activities would be part of the background of views in Mendota
16 Pool Park levee areas. Direct and indirect construction activities would impact viewsheds
17 in the Project area under Alternative C on and off for 133 months.

18 When comparing Alternative C to existing conditions, impacts to visual resources would
19 be similar to those discussed in the preceding paragraph (i.e., the comparison of
20 Alternative C to No-Action) and as discussed under Impact VIS-1 (Alternative A). The
21 visual quality and character of Project area vistas would be impacted during the
22 construction period. Based on viewshed sensitivity, exposure to the Project and the multi-
23 year time frame of construction, impacts on visual resources are considered **potentially**
24 **significant** under Alternative C.

25 **Mitigation Measure VIS-1 (Alternative C): *Minimize Visual Disruption from***
26 ***Construction Activities.*** Refer to Mitigation Measure VIS-1 (Alternative A). The same
27 mitigation measures would be used under Alternative C as under Alternative A. The
28 impact after mitigation would be **less than significant**.

29 **Impact VIS-2 (Alternative C): *Long-term Changes in the Visual Character or Quality***
30 ***of the San Mateo Avenue Crossing.*** Compared with No-Action Alternative, Alternative
31 C impacts at the San Mateo Avenue crossing are similar in scope and scale with impacts
32 of Alternative A. The Project would not substantially impact the quality and character of
33 visual conditions at this public view point. As discussed in Impact VIS-2 (Alternative A),
34 proposed facilities are congruent with existing line, form, mass and color of the visual
35 resources in the Project area, and maintain the character of the Project area. The
36 enhancement of color and mass of existing visual conditions improvements through
37 channel bed and riparian vegetation improvements would have a beneficial effect on the
38 visual resources in the Project area.

39 When comparing Alternative C to existing conditions, impacts to visual resources would
40 be similar to those discussed in the preceding paragraph (i.e., the comparison of
41 Alternative C to No-Action). Based on the existing conditions and the proposed
42 improvements, the effects on visual resources are considered **beneficial**.

1 **Impact VIS-3 (Alternative C): Long-term Changes in the Visual Character or Quality**
 2 **of the Mendota Pool Park Area.** Potential visual impacts for the public viewpoint at
 3 Mendota Pool Park are described below based on sensitivity, Project exposure and visual
 4 modification class.

- 5 • *Sensitivity: High.*
- 6 • *Project Exposure: Moderate to High.*
- 7 • *Existing Visual Condition: VMC 1, Features Appear Congruent with the*
 8 *Prevailing Landscape Character and are Coherently Arrayed.*

9 Under Alternative C, Fresno Slough Dam and new surface water canals would be
 10 constructed near Mowry Bridge. From the closest points along the west shore in the park,
 11 these Project features would be from 970 to 1,240 feet away, placing them in the
 12 background of the closest affected shore-based views. Boaters and recreational users of
 13 Mendota Pool waters could, at their choice, be closer. Users of the park recreational
 14 facilities views would not be impacted by the construction of a new dam or surface water
 15 canals, as the structures would not be visible from the various facilities (picnic tables,
 16 picnic areas).

17 The introduction of a new dam at Mowry Bridge and surface water canals would impact
 18 the color, mass, line and form of views from the levee top of Mendota Pool Park. The
 19 views from the informal paths would be impacted by the new cement dam structure.
 20 Under Alternative C, the new dam would be constructed in the vicinity of Mowry Bridge,
 21 thus blocking views of the bridge. Although viewers expect water infrastructure and
 22 agricultural uses as part of their views, Fresno Slough Dam and the surface water canals
 23 would be new structures that would degrade the quality of the visual resources for users
 24 of informal levee paths. The visual resources currently include Mowry Bridge, and the
 25 addition of a new dam and surface water canals would modify viewers' experiences.

26 Nonetheless, the dam and proposed infrastructure are in keeping with the overall
 27 character of the Project area. The area is composed of water infrastructure, irrigation
 28 facilities and other structures like Mendota Dam and Mowry Bridge. Over time Fresno
 29 Slough Dam and the surface water canals would become part of the character of the area,
 30 as it is defined by agricultural uses and water control infrastructure. The new structures
 31 would represent an interruption in the visual coherence of the site, but only for a limited
 32 number of viewers. The users of Mendota Pool Park recreational facilities would not
 33 experience views of the new dam or new canals. The new dam would impact views of
 34 informal path users by introducing a new cement structure in their view path.
 35 Nonetheless, the new structures would be congruent with the character of the site, and
 36 only slightly modify the color, line and form of the visual resources, as it would replace
 37 or enhance Mowry Bridge.

38 When comparing Alternative C to existing conditions, impacts to visual resources would
 39 be similar to those discussed in the preceding paragraphs (i.e., the comparison of
 40 Alternative C to No-Action). Based on the existing conditions and the proposed

1 improvements, the impacts on visual resources are considered **less than significant** in the
2 Mendota Pool Park area.

3 **Impact VIS-4 (Alternative C): Long-term Changes in the Visual Character or Quality**
4 **of the Mendota Dam Area.** Potential visual impacts for the public viewpoint at Mendota
5 Dam area are described below based on sensitivity, Project exposure and visual
6 modification class.

- 7 • *Sensitivity: Moderate.*
- 8 • *Project Exposure: High.*
- 9 • *Existing Visual Condition: VMC 1, Features Appear Congruent with the*
10 *Prevailing Landscape Character and are Coherently Arrayed.*

11 In contrast to the No-Action Alternative, levees would be constructed under Alternative
12 C to increase the river capacity in the Mendota Dam area. These levees would be within
13 critical public views from the west shore near the Dam (and possibly from the Bass
14 Avenue residential area). A fish ladder would also be constructed at Mendota Dam to
15 provide fish passage, flashboards at Mendota Dam would generally be removed, and the
16 dam's sill may be notched (see Section 2.2.7). The removal of the flashboards would
17 lower water surface elevations in the San Joaquin River arm of Mendota Pool. This
18 change in water surface elevations could have an adverse effect on visual resources.
19 Changes proposed by Alternative C would be within the foreground of views from the
20 west bank of the Mendota Dam area, where some fishing occurs. The introduction of
21 Fresno Slough Dam would not have an adverse effect on visual resources in the Mendota
22 Dam area due to distance and screening from Mowry Bridge. Nonetheless, modifications
23 to Mendota Dam would be required under Alternative C that could affect critical public
24 views. The Dam is highly visible in the immediate foreground of shore-based views in
25 the Mendota Dam area. Therefore, the activities proposed under Alternative C would
26 have an adverse effect on visual resources in the Mendota Dam area.

27 Nonetheless, the changes to the dam, the proposed infrastructure, and changes to water
28 surface elevations are in keeping with the overall character of the Project area. The area is
29 composed of water infrastructure, irrigation facilities, dams, bridges and other water
30 control facilities. Over time changes that would occur under Alternative C would become
31 part of the character of the area, as it is defined by agricultural uses and water control
32 infrastructure.

33 When comparing Alternative C to existing conditions, impacts to visual resources would
34 be similar to those discussed in the preceding paragraphs (i.e., the comparison of
35 Alternative C to No-Action). Based on the existing conditions and the proposed
36 improvements, the impacts on visual resources are considered **less than significant** in the
37 Mendota Dam area.

38 **Impact VIS-5 (Alternative C): Long-term Changes in the Visual Character or Quality**
39 **of the Bass Avenue Residential Area.** Potential visual impacts for the public viewpoint at

1 the Bass Avenue residential area are described below based on sensitivity, Project
2 exposure and visual modification class.

- 3 • *Sensitivity: Low.*
- 4 • *Project Exposure: Low.*
- 5 • *Existing Visual Condition: VMCI, Features Appear Congruent with the*
6 *Prevailing Landscape Character and are Coherently Arrayed.*

7 Under Alternative C, construction of grade control structures in the river channel would
8 occur near Bass Avenue residential area; however, the structures would only be exposed
9 at low flows, and would be screened from view from the Bass Avenue residential area by
10 existing vegetation along the left bank of the river. Compared to the No-Action
11 Alternative, these views from the Bass Avenue residential area would be unchanged.

12 When comparing Alternative C to existing conditions, impacts to visual resources would
13 be similar to those discussed in the preceding paragraphs (i.e., the comparison of
14 Alternative C to No-Action). There would be **no impact** on visual resources at the Bass
15 Avenue residential area.

16 **Impact VIS-6 (Alternative C): *Substantial Changes in Light or Glare.*** Refer to Impact
17 VIS-6 (Alternative A). Potential impacts of Alternative C would be the same as potential
18 impacts of Alternative A. Impacts on visual resources from changes in light and glare are
19 considered **potentially significant**.

20 **Mitigation Measure VIS-6 (Alternative C): *Require Conformance to Lighting***
21 ***Standards.*** Refer to Mitigation Measure VIS-6 (Alternative A). The same mitigation
22 measures would be used under Alternative C as under Alternative A. The impact after
23 mitigation would be **less than significant**.

24 ***Alternative D (Fresno Slough Dam with Wide Floodplain and North Canal)***
25 Alternative D would include construction of Project features including Fresno Slough
26 Dam, a levee system with a wide floodplain encompassing the river channel, and the
27 North Canal. Other key features include construction of the Mendota Dam fish passage
28 facility, the Fresno Slough fish barrier, the North Canal bifurcation structure with fish
29 passage facility and fish screen, removal of the Chowchilla Bifurcation Structure,
30 removal of San Mateo Avenue crossing, and Main Canal and Helm Ditch relocations.
31 Construction activity is expected to occur intermittently over an approximate 158-month
32 timeframe.

33 **Impact VIS-1 (Alternative D): *Construction Related Effects on the Visual Quality of***
34 ***the Project Site and Its Surroundings.*** Compared to the No-Action Alternative,
35 implementation of Alternative D has the potential to result in short and long-term impacts
36 on visual resources near construction activities from public view points. Under
37 Alternative D, construction related effects on visual impacts would generally be the same
38 as those described in Impact VIS-1 (Alternative C) with several exceptions. Unlike
39 Alternative C, this alternative includes a North Canal structure and a wider floodplain,
40 which would result in in potentially more construction related activities and degradation

1 of visual resources. Further, Project construction would take place over a longer time
2 frame, 158 months; therefore construction would impact visual resources at the Project
3 area for a longer duration.

4 When comparing Alternative D to existing conditions, impacts to visual resources would
5 be similar to those discussed in the preceding paragraph (i.e., the comparison of
6 Alternative D to No-Action). Construction activities would impact the color, line, form
7 and mass of visual resources in sensitive viewsheds. Although visual resources would not
8 be permanently impacted during construction, due to their sensitivity, high exposure to
9 the Project and the multi-year time frame of construction, impacts on visual resources are
10 considered **potentially significant**.

11 **Mitigation Measure VIS-1 (Alternative D): *Minimize Visual Disruption from***
12 ***Construction Activities***. Refer to Mitigation Measure VIS-1 (Alternative A). The same
13 mitigation measures would be used under Alternative D as under Alternative A. The
14 impact after mitigation would be **less than significant**.

15 **Impact VIS-2 (Alternative D): *Long-term Changes in the Visual Character or Quality***
16 ***of the San Mateo Avenue Crossing***. Compared with the No-Action Alternative,
17 Alternative D would remove existing facilities that would change the visual character and
18 quality of the Project area at the San Mateo Avenue crossing. Alternative D impacts are
19 similar in scope and scale with impacts of Alternative B, discussed above. The removal
20 of the crossing would restore a continuous river channel in this vicinity and improve the
21 overall natural character.

22 When comparing Alternative D to existing conditions, impacts to visual resources would
23 be similar to those discussed in the preceding paragraph (i.e., the comparison of
24 Alternative D to No-Action). Based on the existing conditions and the proposed
25 improvements, the effects on visual resources are considered **beneficial**.

26 **Impact VIS-3 (Alternative D): *Long-term Changes in the Visual Character or Quality***
27 ***of the Mendota Pool Park Area***. Refer to Impact VIS-3 (Alternative C). Potential
28 impacts of Alternative D would be the same as potential impacts of Alternative C. The
29 impacts on visual resources are **less than significant** in the Mendota Pool Park area.

30 **Impact VIS-4 (Alternative D): *Long-term Changes in the Visual Character or Quality***
31 ***of the Mendota Dam Area***. Refer to Impact VIS-4 (Alternative C). Potential impacts of
32 Alternative D would be the same as potential impacts of Alternative C. Impacts on visual
33 resources are **less than significant** in the Mendota Dam area.

34 **Impact VIS-5 (Alternative D): *Long-term Changes in the Visual Character or Quality***
35 ***of the Bass Avenue Residential Area***. Refer to Impact VIS-5 (Alternative C). Potential
36 impacts of Alternative D would be the same as potential impacts of Alternative C. There
37 would be **no impact** on visual resources at the Bass Avenue residential area.

38 **Impact VIS-6 (Alternative D): *Substantial Changes in Light or Glare***. Refer to Impact
39 VIS-6 (Alternative A). Potential impacts of Alternative D would be the same as potential

1 impacts of Alternative A. Impacts on visual resources from changes in light and glare are
2 considered **potentially significant**.

3 **Mitigation Measure VIS-6 (Alternative D): *Require Conformance to Lighting***
4 ***Standards***. Refer to Mitigation Measure VIS-6 (Alternative A). The same mitigation
5 measures would be used under Alternative D as under Alternative A. The impact after
6 mitigation would be **less than significant**.

7

This page left blank intentionally.

1 **25.0 Cumulative Impacts**

2 This chapter provides an analysis of cumulative effects of the Project alternatives taken
3 together with other past, present, and reasonably foreseeable probable future projects (or
4 actions), as required by National Environmental Policy Act (NEPA) implementing
5 regulations (40 Code of Federal Regulations [CFR] Section 1508.7) and California
6 Environmental Quality Act (CEQA) Guidelines (Cal. Code Regs., tit. 14, § 15130). This
7 analysis follows applicable guidance provided by the Council on Environmental Quality
8 (CEQ) in *Considering Cumulative Effects under the National Environmental Policy Act*
9 (CEQ 1997) and *Guidance on the Consideration of Past Actions in Cumulative Effects*
10 *Analysis* (CEQ 2005) and is consistent with the cumulative impact analysis in the
11 Program Environmental Impact Statement/Report (PEIS/R) (San Joaquin River
12 Restoration Program [SJRRP] 2011, pages 26-1 to 26-33). Direct and indirect impacts of
13 implementing the Project are presented in greater detail in the resource-specific chapters,
14 including Chapter 4.0, “Air Quality,” through Chapter 24.0, “Visual Resources.”

15 **25.1 Definitions of Cumulative Effects**

16 The CEQ regulations that implement NEPA provisions define cumulative effects as “the
17 impact on the environment which results from the incremental impact of the action when
18 added to other past, present, and reasonably foreseeable future actions regardless of what
19 agency (Federal or non-Federal) or person undertakes such other actions. Cumulative
20 impacts can result from individually minor but collectively significant actions taking
21 place over a period of time” (40 CFR Section 1508.7). Individual effects from different
22 activities may add up or interact to cause additional effects not apparent when
23 considering the individual effects one at a time. Additional effects contributed by actions
24 unrelated to the proposed action must be included in the analysis of cumulative effects.
25 These effects can be either adverse or beneficial.

26 Cumulative impacts are defined in State CEQA Guidelines section 15355 as “two or
27 more individual effects which, when considered together, are considerable or which
28 compound or increase other environmental impacts.” A cumulative impact occurs from
29 “the change in the environment which results from the incremental impact of the project
30 when added to other closely related past, present, and reasonably foreseeable future
31 projects. Cumulative impacts can result from individually minor but collectively
32 significant projects taking place over a period of time” (Cal. Code Regs., tit. 14, § 15355,
33 subd. (b)).

34 State CEQA Guidelines section 15130 requires that an Environmental Impact Report
35 (EIR) determine whether the project’s incremental effect is “cumulatively considerable.”
36 The definition of cumulatively considerable is provided in California Code of
37 Regulations, Title 14, section 15065, subdivision (a)(3):

1 *“Cumulatively considerable” means that the incremental effects of an*
2 *individual project are significant when viewed in connection with the*
3 *effects of past projects, the effects of other current projects, and the*
4 *effects of probable future projects.*

5 Consistent with State CEQA Guidelines section 15130, subdivision (a), the discussion of
6 cumulative impacts in this chapter focuses on significant and potentially significant
7 cumulative impacts. The State CEQA Guidelines (Cal. Code Regs., tit. 14, § 15130, subd.
8 (b)) state the following:

9 *The discussion of cumulative impacts shall reflect the severity of the*
10 *impacts and their likelihood of occurrence, but the discussion need not*
11 *provide as great detail as is provided for the effects attributable to the*
12 *project alone. The discussion should be guided by the standards of*
13 *practicality and reasonableness, and should focus on the cumulative*
14 *impact to which the identified other projects contribute rather than the*
15 *attributes of other projects which do not contribute to the cumulative*
16 *impact.*

17 **25.2 Methods and Assumptions**

18 Although NEPA guidelines do not provide specific guidance on how to conduct a
19 cumulative impact analysis, associated actions (past, present, or future) that, when
20 viewed with the proposed or alternative actions, may have significant cumulative impacts
21 were identified. Cumulative impacts should not be speculative, but should be based on
22 known long-range plans, regulations, or operating agreements. Cumulative impacts
23 consider Project-level actions together with other past, present, and reasonably
24 foreseeable probable future actions.

25 The State CEQA Guidelines identify two basic methods for establishing the cumulative
26 environment in which a project is to be considered: the use of a list of past, present, and
27 probable future projects (the “list approach”) or the use of adopted projections from a
28 general plan, other regional planning document, or certified EIR for such a planning
29 document (the “plan approach”). For this cumulative effects analysis, the list approach
30 and the plan approach have been combined in qualitative assessments of cumulative
31 effects to generate the most comprehensive future projections possible, consistent with
32 the SJRRP PEIS/R (SJRRP 2011, page 26-2).

33 Effects of past, present, and reasonably foreseeable probable future actions were assessed
34 qualitatively for all resource areas. Existing information on current and historical
35 conditions was used to evaluate the combined effects of past actions on each resource
36 area. For present and reasonably foreseeable probable future actions, a list of related
37 actions was compiled. The combined effects of these past, present, and reasonably
38 foreseeable probable future actions, and of the actions that were evaluated quantitatively,
39 were then evaluated together with those of the Project alternatives. The combined effects

1 of past actions and the list of related present and reasonably foreseeable probable future
2 projects are described below.

3 For purposes of this Environmental Impact Statement/Report (EIS/R), the Project would
4 have a significant cumulative effect if:

- 5 1. The cumulative effect of related projects (past, current, and probable future
6 projects) without the project are not significant and the project's incremental
7 impact is substantial enough, when added to the cumulative effects, to result in a
8 significant impact.
- 9 2. The cumulative effects of related projects (past, current, and probable future
10 projects) without the project are already significant and the project contributes
11 considerably to the effect. The standards used herein to determine considerability
12 are either that the impact must be substantial or must exceed an established
13 threshold of significance.

14 **25.2.1 Past and Present Actions**

15 A large number of past and present actions have occurred in the Restoration Area. The
16 effects of these past and present actions have strongly influenced existing conditions, and
17 some past actions created "legacies" that are still affecting resources. The following are
18 the most important of these past and present actions:

- 19 • Population growth and associated development of socioeconomic resources and
20 infrastructure.
- 21 • Water development actions.
- 22 • Conversion of natural vegetation to agricultural and developed land uses.
- 23 • Introduction of nonnative plant and animal species.
- 24 • Resource extraction (e.g., mining and timber harvest).

25 **25.2.2 Reasonably Foreseeable Probable Future Actions**

26 Reasonably foreseeable probable future actions are actions that are currently under
27 construction, approved for construction, or in final stages of formal planning at the time
28 of preparation of this EIS/R.

29 The reasonably foreseeable probable future actions considered in this cumulative effects
30 analysis are actions located within the Restoration Area that have been identified as
31 potentially having an effect on resources that also may be affected by the Project. These
32 actions were identified by the list of plans and projects included in the Draft PEIS/R for
33 each resource (SJRRP 2011, Table 26-1), included here in Table 25-1, and by compiling
34 and then considering a preliminary list of additional actions within 5 miles of Reach 2B
35 and Mendota Pool Bypass through reviewing available information regarding planned
36 projects in the vicinity of the Project area.

**Table 25-1.
Reasonably Foreseeable Future Actions Included in the Qualitative Analysis of Cumulative Resource Area Effects in the PEIS/R**

Project	Surface Water Supplies and Facilities Operations	Surface Water Quality	Flood Management	Groundwater	Fisheries	Vegetation and Wildlife	Geology and Soils	Paleontological Resources	Cultural Resources	Indian Trust Assets	Land Use Planning and Agricultural Resources	Recreation	Power and Energy	Visual Resources	Utilities and Service Systems	Public Health and Hazardous Materials	Transportation and Infrastructure	Air Quality	Climate Change	Noise	Socioeconomics
Conveyance Programs																					
Bay-Delta Conservation Plan and Alternative Delta Conveyance Facilities	√	√			√																√
Delta-Mendota Canal/California Aqueduct Intertie		√															√				√
Delta-Mendota Canal Project Recirculation		√															√				√
Lower San Joaquin Flood Improvement Project			√		√												√				
North Delta Flood Control and Ecosystem Restoration Project					√																
South Delta Improvements Program	√	√			√																
Franks Tract Project		√			√								√								
Two Gates Fish Protection Demonstration Project	√	√			√	√	√		√		√	√		√		√	√	√		√	√
Drinking Water Quality Programs																					
Bay Area Water Quality and Supply Reliability Program																					√
North Bay Aqueduct Alternative Intake Project					√																
San Luis Reservoir Low Point Improvement Project		√																			
South Bay Aqueduct Improvement and Enlargement Project																	√				√
In-Delta Storage Program (Delta Wetlands Project)		√			√																

**Table 25-1.
Reasonably Foreseeable Future Actions Included in the Qualitative Analysis of Cumulative Resource Area Effects in the
PEIS/R**

Project	Surface Water Supplies and Facilities Operations	Surface Water Quality	Flood Management	Groundwater	Fisheries	Vegetation and Wildlife	Geology and Soils	Paleontological Resources	Cultural Resources	Indian Trust Assets	Land Use Planning and Agricultural Resources	Recreation	Power and Energy	Visual Resources	Utilities and Service Systems	Public Health and Hazardous Materials	Transportation and Infrastructure	Air Quality	Climate Change	Noise	Socioeconomics	
Los Vaqueros Reservoir Expansion Project		√											√									
North-of-the-Delta Offstream Storage Investigation (Sites Reservoir)	√				√								√									
Shasta Lake Water Resources Investigation (Shasta Reservoir Enlargement)	√				√								√									
Upper San Joaquin River Basin Storage Investigation	√	√		√	√								√	√								
Other Water Resources Projects																						
California Water Plan	√	√		√															√			
Conditional Waiver of Waste Discharge Requirements for Irrigated Lands		√									√											
Conveyance of Refuge Water Supply, South San Joaquin Valley Study Area, Mendota Wildlife Area						√								√		√						
FloodSAFE California			√																			
Folsom Dam Safety and Flood Damage Reduction Project			√																			
Long-Term CVP and SWP Operations	√	√			√																	
Red Bluff Diversion Dam Pumping Plant					√																	
Sacramento River Water Reliability Study					√									√								
San Joaquin River Salinity Management Plan		√				√																
San Joaquin River Water Quality Improvement Project		√			√	√									√		√					

**Table 25-1.
Reasonably Foreseeable Future Actions Included in the Qualitative Analysis of Cumulative Resource Area Effects in the
PEIS/R**

Project	Surface Water Supplies and Facilities Operations	Surface Water Quality	Flood Management	Groundwater	Fisheries	Vegetation and Wildlife	Geology and Soils	Paleontological Resources	Cultural Resources	Indian Trust Assets	Land Use Planning and Agricultural Resources	Recreation	Power and Energy	Visual Resources	Utilities and Service Systems	Public Health and Hazardous Materials	Transportation and Infrastructure	Air Quality	Climate Change	Noise	Socioeconomics
South Delta Flood Bypass		√	√												√						
Tracy Fish Collection Facility and Tracy Fish Facility Improvement Program					√										√						
Resource Management Plans and Programs																					
Central Valley Joint Venture						√															
Central Valley Project Improvement Act		√			√									√							
Ecosystem Restoration Program					√	√								√		√					
Comprehensive Conservation Management Plans for National Wildlife Refuges						√					√			√		√					
Habitat Management Preservation, and Restoration Plan for Suisun Marsh						√								√		√					
Jensen River Ranch Habitat Enhancement and Public Access Project		√				√								√		√					
Lost Lake Park Master Plan						√						√			√		√				
Millerton Lake Resource Management Plan/General Plan						√								√							
Peoria Wildlife Management Area						√								√		√					
Riparian Habitat Joint Venture						√								√							
San Joaquin River Parkway Plan											√	√		√			√				
Vernalis Adaptive Management Program	√	√			√																
New Friant River Outlet Powerhouse													√		√						

**Table 25-1.
Reasonably Foreseeable Future Actions Included in the Qualitative Analysis of Cumulative Resource Area Effects in the PEIS/R**

Project	Surface Water Supplies and Facilities Operations	Surface Water Quality	Flood Management	Groundwater	Fisheries	Vegetation and Wildlife	Geology and Soils	Paleontological Resources	Cultural Resources	Indian Trust Assets	Land Use Planning and Agricultural Resources	Recreation	Power and Energy	Visual Resources	Utilities and Service Systems	Public Health and Hazardous Materials	Transportation and Infrastructure	Air Quality	Climate Change	Noise	Socioeconomics
Development Projects																					
Fresno County General Plan		√				√	√				√			√	√	√	√	√		√	
Madera County General Plan Policy Document		√				√	√				√			√	√	√	√	√		√	
Merced County General Plan		√				√	√				√			√	√	√	√	√		√	
City of Fresno General Plan		√				√	√				√			√	√	√	√	√		√	
Brighton Crest		√					√				√			√		√	√	√			
Gunner Ranch West Specific Plan		√					√				√			√		√	√	√			
Ventana Annexation		√					√				√			√		√	√	√			
Gateway Village Specific Plan		√					√				√			√		√	√	√			

Key:

- CVP = Central Valley Project
- Delta = Sacramento-San Joaquin Delta
- SWP = State Water Project

1 Additional actions within 5 miles of Reach 2B were evaluated for inclusion in the
2 cumulative effects analysis based on three criteria that all must be met to be considered to
3 be reasonably foreseeable:

- 4 • The action has an identified sponsor actively pursuing project development, has
5 completed or issued NEPA and/or CEQA compliance documents such as a Draft
6 or final EIS or EIR, and appears to be “reasonably foreseeable” given other
7 considerations such as site suitability, funding and economic viability, and
8 regulatory limitations.
- 9 • Available information defines the action in sufficient detail to allow meaningful
10 analysis.
- 11 • The action could affect resources potentially affected by the Project.

12 Based on this review, the effects of the actions listed in Table 25-1 and additional actions
13 described below were qualitatively considered in the assessment of the cumulative effects
14 of the Project. The list in Table 25-1 is organized into three categories of actions, all of
15 which were considered together when determining potential cumulative effects: water
16 resources projects, resource management plans and programs, and development projects.
17 (See PEIS/R [SJRRP 2011, pages 26-9 to 26-33] for a description of the projects listed in
18 Table 25-1.)

19 ***Central Valley Power Connect, Segment 24***

20 Pacific Gas and Electric (PG&E) is considering route options for the Central Valley
21 Power Connect project, including options that cross the San Joaquin River north of the
22 city of San Joaquin. The Central Valley Power Connect would include construction of a
23 new 230,000 volt electric transmission line connecting the Gates substation east of
24 Coalinga and the Gregg substation northwest of Fresno. The transmission line would
25 span about 70 miles through portions of Fresno, Kings and Madera counties. Route
26 options near the city of Mendota (Segment 24) are no longer proposed at this time.

27 ***Long-Term Water Transfers, Central Valley and Bay Area, California***

28 The Department of Interior, Bureau of Reclamation (Reclamation) and the San Luis &
29 Delta-Mendota Water Authority have issued, in August 2014, a draft EIS/R analyzing
30 water transfers to the Central Valley Project (CVP) contractors south of the Delta and in
31 the San Francisco Bay area from CVP and non-CVP sources from north of the Delta
32 using Delta pumps (both CVP and State Water Project (SWP) facilities). Water transfers
33 would occur through various methods such as groundwater substitution, cropland idling,
34 reservoir release, and conservation, and would include individual and multiyear transfers
35 from 2015 through 2024.

36 ***Mendota General Plan Update***

37 The City of Mendota has issued a final EIR that describes the potentially significant
38 environmental impacts associated with buildout of the City's 2005-2025 General Plan
39 Update. The General Plan Update contains a comprehensive update to the City's land use,
40 circulation, open space and conservation, noise, and safety elements. A notice of
41 determination (NOD) was filed in August 2009.

1 **2030 Firebaugh General Plan**

2 The Final EIR for the 2030 Firebaugh General Plan was adopted by Firebaugh's city
3 council in January 2010. The 2030 Firebaugh General Plan is a comprehensive update of
4 six elements of the Firebaugh General Plan, including land use, circulation, conservation,
5 open space, noise and safety. The planning time frame is through the year 2030.

6 **State Route (SR) 33 Intersection Improvements**

7 SR 33 is a north/south State highway that bisects the western portion of the City of
8 Mendota. The SR 33 Intersection Improvements project proposes to construct a new
9 intersection at SR 33 and Lozano Street and improve two existing intersections at SR 33
10 and Bass and Belmont Avenue. Upon completion of proposed projects within the City,
11 traffic would likely increase to three times the existing level on SR 33. Improvement to
12 key intersections and the construction of a new intersection would accommodate this
13 future increase and maintain the current level of service of the City's circulation system.
14 A NOD for this project was filed in March 2009.

15 **SR 180 Westside Expressway Route Adoption Study**

16 The California Department of Transportation proposes to adopt a new expressway
17 corridor for SR 180 between Interstate 5 and Valentine Avenue in west Fresno. Three
18 proposed route adoption alternatives together with additional route variations and the No-
19 Action/No-Project Alternative are under consideration. The Final EIR was certified and a
20 NOD was filed in March 2013.

21 **Gill Ranch Gas Storage Project**

22 The Gill Ranch Gas Storage project would develop approximately 20 acres of surface
23 facilities including a 10-acre central compressor station, gas injected withdrawal wells,
24 fields gathering lines, observation wells, a 26.7-mile 30-inch-diameter gas transmission
25 pipeline, and 9.3-mile electric power line. There are five locations where the 30-inch gas
26 pipeline crosses water features. These locations are: Fresno Slough Overflow "Feature
27 16," Fresno Slough Overflow "Feature 16A," Fresno Slough "Feature 17," San Joaquin
28 River, and Lone Willow Slough-Chowchilla Canal Bypass. A Mitigated Negative
29 Declaration (MND) was certified in 2009. Construction began in January 2010. Post-
30 construction restoration in areas of natural habitat disturbance, as well as facility
31 operations compliance activity, is underway.

32 **San Joaquin River Bank Repair Project**

33 The City of Firebaugh is proposing to repair an approximate 300-foot-long portion of the
34 west bank of the San Joaquin River that was damaged by flooding in 2006. The repair
35 strategy consists of installation of a sheet pile/Reno Mattress system. A NOD was filed in
36 February 2010.

37 **Grassland Bypass Project**

38 The continuation of Grassland Bypass Project 2010–2019, as described in the final
39 EIS/R, allows the Grassland Area Farmers additional time to complete agricultural
40 drainage collection and treatment from the 97,400-acre Grassland Drainage Area with
41 discharges of a portion of the drainage to the San Luis Drain. This drainwater must meet
42 increasingly stringent selenium load requirements for discharges to Mud Slough. At

1 present, Reclamation is assisting with implementation of a pilot project for the final
2 treatment component. Construction of the pilot plant is underway. In addition, the
3 Grassland Area Farmers will continue to test various treatment processes for management
4 of the final fraction of the drainage from the drainage reuse facility, which is needed to
5 comply with the waste discharge requirements.

6 **20-Year Extension of the 2005 Mendota Pool Exchange Agreement**

7 The Mendota Pool 10-year Exchange Agreements that are currently in place span the
8 years 2005 to 2014, and an extension of the agreements is necessary for Mendota Pool
9 Group farmers to continue this exchange after 2014. The proposed extension would allow
10 Mendota Pool Group farmers in the Mendota Pool area to continue to pump up to 26,250
11 acre-feet per year of groundwater of suitable quality into the Mendota Pool for exchange
12 of up to 25,000 acre-feet per year CVP water delivered to the San Luis Canal for use by
13 Mendota Pool Group farmers in the San Luis Canal service area of San Luis Water
14 District and Westlands Water District when the existing agreements expire.

15 **San Joaquin River National Blueway**

16 The America's Outdoor Initiative was launched in 2010 and calls for multiple Federal
17 agencies, including the Department of Interior, to implement projects that would promote
18 conservation and recreation on public lands. One of the proposed projects under this
19 initiative is the San Joaquin River National Blueway. The San Joaquin River National
20 Blueway is an integrated system of "parks, wildlife refuges, and other publicly accessible
21 places that provides the public an opportunity to explore and enjoy the San Joaquin River
22 from its headwaters to the Delta" (San Joaquin River Partnership 2011). Recreation
23 opportunities offered by the San Joaquin River National Blueway include boating,
24 swimming, picnicking, walking and jogging, cycling, hiking, interpretive trails, wildlife
25 viewing, bird watching, fishing and hunting. The San Joaquin River National Blueway
26 plan identifies Fresno Slough (near the Mendota Wildlife Area) as an existing access site.

27 **25.3 Significance Criteria**

28 Two significance criteria must be met for an environmental consequence to have a
29 significant cumulative impact: 1) the effect must make a cumulatively considerable
30 incremental contribution to an overall cumulative impact, and 2) the overall cumulative
31 impact (considering past, present, and reasonably foreseeable probable future projects)
32 must be significant. These criteria are based on the State CEQA Guidelines as amended
33 and the 1997 guidelines prepared by the CEQ, *Considering Cumulative Effects under the*
34 *National Environmental Policy Act* (CEQ 1997).

35 **25.4 Mitigation Measures for Significant Cumulative Impacts**

36 To reduce any cumulatively considerable incremental contributions from Project
37 alternatives to an overall cumulative impact, feasible mitigation measures were proposed
38 for all potentially significant and significant direct and indirect effects; these measures
39 are presented in the individual resource sections. It was not feasible to reduce any of the

1 overall significant cumulative impacts (in no case was a Project alternative's incremental
 2 contribution the reason for an overall significant cumulative impact). Therefore, no
 3 further feasible mitigation could be applied to reduce significant, or potentially
 4 significant, overall cumulative impacts to less-than-significant levels. In this case, the
 5 cumulative impacts are considered to be significant and unavoidable.

6 **25.5 Cumulative Effects Analysis**

7 The cumulative effects analysis is described below for each resource area. The analysis of
 8 cumulative impacts for all resource areas is based on effects of past, present, and
 9 reasonably foreseeable probable future actions in the Restoration Area. The concern is
 10 whether small incremental effects from the Project when combined with the other
 11 approved future plans and projects in the Project area and vicinity would lead to a
 12 significant cumulative impact in the region.

13 Given the number of actions that are common to all Project alternatives and that the
 14 actions in the Settlement are relatively fixed, there would be minimal differences between
 15 Project alternatives with respect to cumulative effects. Therefore, the cumulative effects
 16 analysis applies to all Project alternatives. Several impacts were determined to have the
 17 potential to result in a cumulatively considerable incremental contribution to a significant
 18 cumulative impact. These impacts are described in the subsequent sections, and include
 19 the following:

- 20 • **Air Quality:** Effect to sensitive receptors during Project construction.
- 21 • **Cultural Resources:** Potential losses of archaeological resources.
- 22 • **Environmental Justice:** Regional economic factors that are adversely affecting
 23 minority and/or low-income populations.
- 24 • **Land Use Planning and Agriculture:** Conversion of agricultural land to non-
 25 agricultural uses.
- 26 • **Socioeconomics and Economics:** Substantial short term economic impacts
 27 associated with reduced agricultural production in the region.

28 Table 25-2 presents a summary of impacts where the impact was determined to make a
 29 cumulatively considerable incremental contribution to an overall significant cumulative
 30 impact.

1
2
3

**Table 25-2.
Project Impacts with the Potential to Result in Cumulatively Considerable
Incremental Contributions to Significant Cumulative Impacts**

Resource Area	Impact
Air Quality	Exposure of sensitive receptors to Project inputs and additional industrial sources, construction projects, and vehicles on roadways in the Project area
Cultural Resources	Disturbance or destruction of cultural resources
Environmental Justice	Regional economic factors that are adversely affecting minority and/or low-income populations
Land Use Planning and Agriculture	Conversion of designated Farmland to nonagricultural uses
Socioeconomics and Economics	Substantial short term economic impacts associated with losses in agricultural production
Transportation and Traffic	Temporary or permanent road closure(s) that could affect emergency access or emergency response times

4 **25.5.1 Air Quality**

5 Cumulative effects on air quality could occur at the local, regional, and global scales. The
6 cumulative effects at the local and regional scales are discussed in this section;
7 cumulative effects at the global scale are discussed separately in Section 25.5.5.

8 In the context of air quality, applicable plans and projects for the cumulative effects
9 analysis include several roadway improvement projects (including the SR 33 Intersection
10 Improvements project and the SR 180 Westside Expressway Route Adoption Study),
11 General Plan or Specific Plan updates for nearby cities (including the cities of Mendota
12 and Firebaugh), Gill Ranch Gas Storage Project, and other various infrastructure and
13 water improvement projects. At the local level, the city of Mendota General Plan Update
14 also has implications for air quality near the Project area with its goals to expand
15 residential housing, commercial buildings and industrial facilities.

16 The addition of industrial sources, construction equipment associated with new
17 residential and commercial buildings, and vehicles on roadways in the Project area and
18 vicinity would result in increases of criteria air pollutants and toxic air contaminants.
19 These air pollutants would add to the current air quality problems, in particular for
20 Reactive Organic Gases (ROGs), nitrogen oxides (NO_x), particulate matter with an
21 aerodynamic resistance diameter of 10 micrometers or less (PM₁₀) and fine particulate
22 matter with an aerodynamic resistance diameter of 2.5 micrometers or less (PM_{2.5}), which
23 have caused the San Joaquin Valley Air Basin to be designated as non-attainment for
24 Federal and State Ambient Air Quality Standards. The San Joaquin Valley Air Pollution
25 Control District (SJVAPCD) has several plans, regulations, and incentive programs to
26 address the air quality problems. However, the reduction in emissions relies upon
27 numerous agencies to assist in reducing the emissions in the air basin to an appropriate
28 level. This includes Federal and State regulations to improve vehicle emission standards,
29 driving habits of individuals, and pollution control of point sources by industry. Since the
30 Project construction would mitigate on-site and off-set any remaining exhaust emissions,
31 the Project alternatives would not contribute to an increase in regional emissions that

1 conflicts with the budget used for regional air quality planning. Therefore, the Project
 2 would not provide a cumulatively considerable incremental contribution to the
 3 cumulative air quality impact.

4 The addition of industrial sources, construction projects, and vehicles on roadways can
 5 affect sensitive receptors in the Project Area. Because Project construction would result
 6 in a significant impact to sensitive receptors, even after implementation of mitigation
 7 measures, Project alternatives would result in a cumulatively considerable incremental
 8 contribution to a significant cumulative air quality impact to sensitive receptors during
 9 Project construction.

10 The Project is not anticipated to have a significant amount of emissions once Project
 11 construction is complete. Therefore, implementation of Project alternatives (Project
 12 operation over the long term) would not provide a cumulatively considerable incremental
 13 contribution to a significant cumulative impact on air quality and sensitive receptors
 14 during Project operation.

15 The cumulative impact to odors would be less than significant since there are no major
 16 sources of odors associated with the Project.

17 In summary, all Action Alternatives would only result in **one potentially significant and**
 18 **unavoidable cumulative air quality impact**, the effect to sensitive receptors during
 19 Project construction.

20 **25.5.2 Biological Resources – Fisheries**

21 In the context of fisheries cumulative effects analysis, applicable plans and projects
 22 referenced in the PEIS/R (SJRRP 2011, pages 26-3 to 26-33) include:

- 23 • Bay-Delta Conservation Plan and Alternative Delta Conveyance Facilities.
- 24 • Lower San Joaquin Flood Improvement Project.
- 25 • North Delta Flood Control and Ecosystem Restoration Project.
- 26 • South Delta Improvements Program.
- 27 • Franks Tract Project.
- 28 • Two Gates Fish Protection Demonstration Project.
- 29 • North Bay Aqueduct Alternative Intake Project.
- 30 • In-Delta Storage Program (Delta Wetlands Project).
- 31 • North-of-the-Delta Offstream Storage Investigation (Sites Reservoir).
- 32 • Investigation (Shasta Reservoir Enlargement).
- 33 • Upper San Joaquin River Basin Storage Investigation.
- 34 • Long-Term CVP and SWP Operations.
- 35 • Red Bluff Diversion Dam Pumping Plant.
- 36 • Sacramento River Water Reliability Study.

- 1 • San Joaquin River Water Quality Improvement Project.
- 2 • Tracy Fish Collection Facility and Tracy Fish Facility Improvement Program.
- 3 • Central Valley Project Improvement Act (CVPIA).
- 4 • Ecosystem Restoration Program.
- 5 • Vernalis Adaptive Management Program (which expired in 2011).

6 At the local level, the Gill Ranch Gas Storage Project may also have implications for
7 fisheries near the Project Area, but with construction complete and no incidental take
8 permit required, only post-construction restoration of natural habitat disturbance remains.

9 None of the cumulative projects or plans referenced in the PEIS/R would likely adversely
10 affect fisheries conditions in the Project area based on their location relative to the Project
11 and their intention to improve aquatic habitat conditions. Many programs occur
12 downstream within the Bay-Delta, while others occur elsewhere in the Central Valley
13 (e.g., Sacramento River basin). Many activities currently underway or that are reasonably
14 certain to occur in the future are intended to improve aquatic habitat conditions. These
15 activities include the implementation of the CVPIA and the Ecosystem Restoration
16 Program, which would improve and restore fish and wildlife habitat. Through these
17 programs, the populations of aquatic resources are expected to improve in the long term.
18 Other projects, programs, and plans that are currently underway or are reasonably certain
19 to occur in the near future could further benefit salmonids and other native fish species.
20 These projects, programs, and plans include resource management plans and the Vernalis
21 Adaptive Management Program (if continued past 2011) to protect, restore, and enhance
22 fish and wildlife in the Central Valley and the Bay-Delta ecosystems. None of the
23 cumulative projects or plans referenced in the PEIS/R would adversely affect fisheries
24 conditions in the Project area as all the potential effects would either be beneficial or
25 would not impact fisheries.

26 As noted in Section 5.3.3, construction activity in the active channel under all the Project
27 alternatives could result in small, incremental adverse impacts on aquatic species,
28 including crushing, disturbance of organisms, release of sediment, and release of
29 pollutants associated with ground disturbance or equipment operation. These effects
30 would be minimized by the use of cofferdams installed during low flow conditions and
31 fish removal from the construction areas prior to installation. Water from dewatered
32 construction sites would be placed in settling basins or treated prior to release into the
33 river or Mendota Pool. No other notable cumulative projects would contribute to this
34 incremental effect; therefore, the effect is not cumulatively considerable.

35 As noted in Section 5.3.3, Alternatives A and D would allow for agricultural use on the
36 expanded floodplains within the levees. The majority of the expanded floodplain would
37 become inundated about every two years at flows of around 2,500 cubic feet per second
38 (cfs) and higher. While flooding of a native floodplain may improve rearing habitat for
39 outmigrating juvenile salmonids, agricultural activities may introduce contaminants
40 (fertilizers, pesticides) directly to the floodplain where they could potentially become
41 entrained in the flow and affect juvenile fish rearing in Reach 2B or in downstream
42 reaches. No other notable cumulative projects would contribute to this effect.

1 Based on the information presented above, there are no projects or programs that when
 2 combined with the less-than-significant impacts anticipated with the Project (as outlined
 3 in Section 5.3.3) would result in cumulatively considerable impacts. In summary, **no**
 4 **cumulatively considerable contribution** to impacts to fisheries resources are expected
 5 under any of the Project alternatives incorporating floodplain agricultural activities (i.e.,
 6 Alternatives A and D).

7 **25.5.3 Biological Resources – Vegetation**

8 Several future actions have the potential to affect special-status vegetation alliances in
 9 Reach 2B. These actions include a number of restoration programs and plans from which
 10 native vegetation resources in the area would benefit. In the context of sensitive
 11 vegetation alliances, applicable plans and projects identified in the PEIS/R and Section
 12 25.2.2 include:

- 13 • Conveyance of Refuge Water Supply, South San Joaquin Valley Study Area,
 14 Mendota Wildlife Area.
- 15 • San Joaquin River Salinity Management Plan.
- 16 • San Joaquin River Water Quality Improvement Project.
- 17 • Comprehensive Conservation Management Plans for National Wildlife Refuges.
- 18 • Riparian Habitat Joint Venture.
- 19 • San Joaquin River Bank Repair Project.
- 20 • Fresno County General Plan.
- 21 • Madera County General Plan.

22 None of these plans is in conflict with the goals and intent of the Project. They include
 23 plans to ensure water deliveries to the Mendota Wildlife Area, improve water quality in
 24 the San Joaquin River, coordinate efforts to restore habitats and manage wildlife, and
 25 develop agriculture, while protecting water quality and natural habitat. Implementation of
 26 these plans may be phased over many years, and may depend on the availability of
 27 funding or other resources. The benefits realized by these future plans may take years to
 28 be implemented.

29 In contrast, the adverse effects on sensitive vegetation alliances caused by the spread of
 30 non-native invasive plant species and further degradation of habitat are likely to increase
 31 over time. Other projects could facilitate the dispersal and establishment of invasive
 32 plants in several ways: through transporting invasive plants' propagules into the Project
 33 area; creating bare ground for them to establish, by altering hydrology in a manner that is
 34 advantageous to invasive plant species, and eliminating competing native vegetation.

35 The cumulative significant adverse impact on existing sensitive vegetation alliances are
 36 primarily caused by other past and present actions and inactions. However, some
 37 beneficial effects would occur in areas upstream of San Mateo Avenue crossing where
 38 riparian habitat would mature.

1 Implementing any of the Project alternatives would result in some less than significant
2 adverse impacts, as well as in numerous beneficial effects on sensitive vegetation
3 alliances. Most adverse effects to sensitive vegetation alliances would be local in scale
4 and temporary, occurring during construction of Project infrastructure. The extensive
5 conservation measures would reduce or minimize potential adverse effects. The
6 beneficial effects of the Project alternatives would be regional and cumulative. For all
7 Project alternatives, it is expected that restoration activities would improve sensitive
8 vegetation alliance conditions within and along the river. Control of invasive plant
9 species would enhance the diversity and extent of sensitive vegetation alliances
10 throughout Reach 2B. Over time, native riparian vegetation would mature, prevent
11 invasive exotic species to take hold by shading them out, and continue to contribute to the
12 formation and expansion of high quality sensitive vegetation alliances in the area. As a
13 consequence, the overall effect of the implementation of Project alternatives on sensitive
14 vegetation alliances would be beneficial and the Project would not contribute
15 incrementally to any significant adverse cumulative effects.

16 In summary, with implementation of the conservation strategy of the Project, the Project
17 effects would be beneficial with a range from negligible to substantial benefits for
18 sensitive vegetation alliances. There would **not be a cumulatively considerable**
19 **contribution** to a cumulative impact on sensitive vegetation alliances.

20 **25.5.4 Biological Resources – Wildlife**

21 Past actions by humans have substantially changed wildlife populations and wildlife
22 habitat in the Project area and vicinity, as compared to historical conditions. The most
23 important of these past actions have been the conversion of natural vegetation to
24 agricultural and developed land uses, water diversions, and the introduction of nonnative
25 plant and animal species. These changes have resulted in overall significant adverse
26 effects on ecosystems and the wildlife that depend on them.

27 Several reasonably foreseeable future actions also have the potential to affect wildlife
28 populations and wildlife habitat in the Project area and vicinity. These actions include a
29 number of restoration programs and plans from which vegetation and wildlife resources
30 would benefit. In the context of wildlife, applicable plans and projects referenced in the
31 PEIS/R and Section 25.2.2 include:

- 32 • Conveyance of Refuge Water Supply, South San Joaquin Valley Study Area,
33 Mendota Wildlife Area.
- 34 • San Joaquin River Salinity Management Plan.
- 35 • San Joaquin River Water Quality Improvement Project.
- 36 • Comprehensive Conservation Management Plans for National Wildlife Refuges.
- 37 • Riparian Habitat Joint Venture.
- 38 • Fresno County General Plan.
- 39 • Madera County General Plan.

1 None of these plans is in conflict with the goals and intent of the Project. They include
2 plans to ensure water deliveries to the Mendota Wildlife Area, improve water quality in
3 the San Joaquin River, coordinate efforts to restore habitats and manage wildlife, and
4 develop agriculture while protecting water quality and habitats. Implementation of these
5 plans may be phased over many years and dependent on the availability of funding or
6 other resources. The benefits realized by these future plans may take years to come about.
7 The list of additional projects contained in Section 25.2.2 have been considered as well
8 and, at the local level, general plan updates for nearby cities (including the cities of
9 Mendota and Firebaugh) could also benefit wildlife in the Project Area.

10 In contrast, the adverse effects on vegetation and wildlife caused by the spread of
11 invasive species and further degradation of habitat are likely to increase over time. Other
12 projects could facilitate the dispersal and establishment of invasive plants in several
13 ways: through transporting invasive plants' propagules into the Project area; creating bare
14 ground for them to establish; by altering hydrology in a manner that is advantageous to
15 invasive plant species; and eliminating competing native vegetation. These other past,
16 present, and future projects would have a cumulative significant adverse effects on
17 riparian vegetation and other sensitive habitats, wetlands, and special-status plant and
18 wildlife species. However, some beneficial effects would occur in areas upstream of San
19 Mateo Avenue crossing where riparian habitat would mature.

20 Implementing any of the Project alternatives would result in both adverse and beneficial
21 effects on wildlife. Most adverse effects to wildlife would be local in scale and
22 temporary, occurring during construction of Project infrastructure. Conservation
23 measures would reduce or minimize potential adverse effects. The beneficial effects of
24 the Project alternatives would be regional and cumulative. For all Project alternatives, it
25 is expected that restoration activities would improve habitat conditions within and along
26 the river. Control of invasive plant species would also enhance these habitats throughout
27 Reach 2B. Over time, riparian vegetation would mature and continue to provide habitat.
28 As a consequence, the overall effect of the implementation of Project alternatives on
29 wildlife would be beneficial, and would not make a considerable contribution to
30 cumulative effects on wildlife. Thus, the Project would not contribute to a significant
31 adverse cumulative effect.

32 In summary, with implementation of the restoration features/elements and Conservation
33 Strategy of the Reach 2B restoration plan, the Project effects would be beneficial with a
34 range from negligible to substantial benefits for wildlife species. There would **not be a**
35 **cumulatively considerable contribution** to a cumulative impact on special-status animal
36 species.

37 **25.5.5 Climate Change and Greenhouse Gas Emissions**

38 The emissions from one project, even a very large project, are miniscule in comparison to
39 worldwide or even statewide greenhouse gas (GHG) emissions. However, the California
40 State Lands Commission (CSLC) has concluded that the emissions from each project
41 have an incremental contribution to the buildup of GHGs in the atmosphere and may
42 have a significant environmental impact when analyzed on a cumulative basis.

43 Cumulative impacts are those resulting from the incremental impact of the project when

1 added to other past, present, and reasonably foreseeable probable future projects (Cal.
2 Code Regs., tit. 14, § 15355, subd. (b)). Therefore, CSLC practice on a case-by-case basis
3 is to analyze the significance of GHG emissions as part of the cumulative impacts
4 analysis (Cal. Code Regs., tit. 14, § 15130, subd. (f)).

5 Cumulative impacts associated with climate change and GHG emissions are discussed in
6 Section 8.3.3. The Project could result in an incremental impact from GHG emissions
7 associated with construction of the Project; however, mitigation measures would be
8 implemented to reduce these impacts to a less than significant level. Therefore, there
9 **would not be a cumulatively considerable contribution** to a significant cumulative
10 impact on climate change.

11 **25.5.6 Cultural Resources**

12 Applicable plans and projects referenced in the PEIS/R and additional projects contained
13 in Section 25.2.2 have been considered in the cumulative effects analysis and, at the local
14 level, the San Joaquin River Bank Repair Project would have ground disturbing activities
15 that have the potential to encounter cultural resources in riverbank and floodplain areas.

16 Under the cumulative condition, cultural resources would continue to be affected in the
17 Central Valley rural areas due to growth, changes in land use, and ground disturbance.
18 Adverse effects on eligible resources could result in the neglect, abandonment, or
19 removal of historic properties. A given project is not likely to be able to avoid impacts to
20 known or unknown cultural resources, especially in the case of a project that requires
21 major ground disturbance. Development would likely result in further unearthing of
22 sensitive archaeological resources, disturbance of traditional cultural properties,
23 disturbance and possible damage to paleontological resources, and removal of—or
24 changes to—the historic character and settings of historic resources. Potential cumulative
25 impacts to archaeological resources were assumed to be significant for the purpose of this
26 EIS/R.

27 Cultural resource archival and field survey investigations conducted within the Project
28 area identified two previously recorded archaeological resource areas (considered
29 historical resources under CEQA) that may be adversely affected by the Project. In
30 addition, the Project area contains 13 buildings or groups of buildings and structures that
31 required formal evaluations. All of these resources are located within Fresno or Madera
32 counties and were constructed in or before 1965. Mendota Dam has been determined
33 eligible for the National Register of Historic Places (National Register) and is listed in the
34 California Register of Historic Resources (California Register). Additionally,
35 Reclamation has found the Delta-Mendota Canal (DMC) individually eligible for the
36 National Register (and California Register).

37 It is likely that known or unknown archaeological resources could be disturbed and
38 cultural resources damaged or destroyed during construction activities for any of the
39 Action Alternatives. Loss of a unique archaeological resource could occur where
40 excavations encounter archaeological deposits that cannot be removed or recovered (e.g.,
41 under levees), or where recovery would not be sufficient to prevent the loss of the
42 cultural material's significance. Although mitigation would be implemented to reduce

1 effects on potentially significant cultural resources, adverse effects, particularly on
 2 archaeological resources, may still occur. Losses of archaeological resources would add
 3 to a historical trend in the loss of these resources as artifacts of cultural significance and
 4 as objects of research importance; therefore, there is an overall significant cumulative
 5 impact on cultural resources along the San Joaquin River. Even with implementation of
 6 mitigation measures, the Project alternatives have the **potential to make a cumulatively**
 7 **considerable incremental contribution** to a significant cumulative impact on cultural
 8 resources along the San Joaquin River.

9 **25.5.7 Environmental Justice**

10 There are no applicable plans and projects referenced in the PEIS/R that relate to
 11 cumulative effects on environmental justice. For this analysis, economic factors that
 12 could affect minority and/or low-income populations in the region disproportionately are
 13 considered in the context of environmental justice.

14 Generally, the cumulative effects of the Project on environmental justice considerations
 15 in the Project area and vicinity are difficult to evaluate. The agriculture sector comprised
 16 nearly 14 percent of total employment in the two-county region in 2012 (see Section
 17 21.1.3). Accordingly, it is clear that local farm workers play a large role in the economic
 18 vitality of the region. However, the regional economy has been adversely affected by the
 19 statewide economic recession as evidenced by relatively high unemployment rates. Both
 20 the statewide impacts on the agricultural industry and overall poor performance of the
 21 regional economy have been especially difficult for minority and low-income populations
 22 living in the region.

23 All of the Project alternatives would generate both incremental economic benefits
 24 (attributed to construction and operations spending) and adverse effects (attributed to
 25 decreases in agricultural production) on the regional economy that, when combined with
 26 similar effects from restoration of the other reaches of the San Joaquin River and other
 27 projects and economic conditions, could affect minority and/or low-income populations.
 28 However, the extent to which minority and/or low-income populations would realize
 29 these effects is unknown. Therefore, the cumulative effect of the Project on
 30 environmental justice considerations is difficult to ascertain, but it is conservatively
 31 assumed that implementation of the Project under all of the Action Alternatives (i.e.,
 32 Alternatives A, B, C, and D) may cumulatively contribute to regional factors that are
 33 adversely affecting minority and/or low-income populations in the region and **potentially**
 34 **result in a cumulatively considerable incremental contribution** to disproportionately
 35 high and adverse effects on minority and low-income populations.

36 **25.5.8 Geology and Soils**

37 Impacts to geology and soils in the Project area could occur as a result of increased flows
 38 under the Program's reoperation of the Friant Dam for Restoration Flows. Impacts to
 39 geology and soils from implementing the Settlement in areas other than Reach 2B could
 40 include localized soil erosion, sedimentation, and inadvertent soil loss; loss of availability
 41 of a valuable mineral; and increased channel erosion, sediment transport, and meander
 42 migration; however, construction best management practices (BMPs) would be
 43 implemented to minimize the significance of these impacts.

1 Several potential changes could occur from other reasonably foreseeable probable future
2 projects. In particular, U.S. Army Corps of Engineers (Corps) levee vegetation policy has
3 the potential to affect geology and soils in the Project area. The April 2014 revised policy
4 (Corps 2014) calls for the removal of vegetation from levees as necessary to maintain
5 levee integrity and firefighting access. However, how the policy would be implemented
6 in the Project area is not yet known. Implementation of this policy may result in removal
7 of vegetation from the San Joaquin River channel that could result in localized erosion.

8 Implementing the Project alternatives would result in potential localized erosion and
9 sedimentation in the Project area, particularly during channel construction, levee
10 construction, and other ground-disturbing activities. Standard construction BMPs would
11 be implemented in the Project area such as covering exposed slopes, installing silt fences,
12 and placing straddles, among other accepted erosion control measures. Implementing the
13 Project alternatives with these erosion control measures would result in some less-than-
14 significant localized erosion and sedimentation transport. The Project alternatives,
15 however, **would not result a cumulatively considerable incremental contribution** to
16 the overall cumulative impact on San Joaquin River erosion and sedimentation

17 **25.5.9 Hydrology – Flood Management**

18 Projects that were identified in the PEIS/R and Section 25.2.2 that could have a
19 cumulative effect on flood management include the Lower San Joaquin Flood
20 Improvement Project, FloodSafe California, the South Delta Flood Bypass (see Table 25-
21 1) and the San Joaquin River Bank Repair Project. The Lower San Joaquin Flood
22 Improvement Project and the South Delta Flood Bypass projects would not be
23 implemented near the Project area. FloodSafe California does not have any specific plans
24 for Reach2B. San Joaquin River Bank Repair Project would be implemented near the
25 Project area, but the effects of this project would be beneficial. Therefore, there are no
26 past, present or foreseeable future projects that when combined with the effects from this
27 Project would have adverse cumulative impacts to hydrology and flood management.
28 Therefore, implementing the Project would **not make a cumulatively considerable**
29 **incremental contribution** to a significant cumulative effect on flood management; the
30 incremental contribution would be minor and the overall cumulative effect on flood
31 management would continue to be beneficial.

32 **25.5.10 Hydrology – Groundwater**

33 Based on past, present, and reasonably foreseeable probable future actions, groundwater
34 levels in the San Joaquin Valley are generally substantially reduced from historical levels
35 and an overall significant cumulative impact exists on groundwater basins. Land
36 subsidence has occurred throughout the San Joaquin Valley primarily due to aquifer-
37 system compaction when groundwater levels decline, including areas near Mendota Pool.
38 Consequently, past, present, and reasonably foreseeable probable future actions have
39 caused an overall significant cumulative effect on the groundwater basin. However, the
40 Project would not require increasing groundwater extraction but instead convert irrigated
41 agricultural lands to floodplain areas. Therefore, Project alternatives would not result in a
42 cumulatively considerable incremental contribution to groundwater extraction.

1 Groundwater extraction in the San Joaquin Valley has also resulted in changes to
2 groundwater quality. Irrigation of crops along the west side of the San Joaquin Valley has
3 resulted in localized areas of increased salts and trace metals in the shallow groundwater
4 table. The San Joaquin River Water Quality Improvement Project would be expected to
5 have a beneficial effect in the San Joaquin Valley by expanding the In-Valley
6 Treatment/Drainage Reuse Facility. In contrast to other areas in the San Joaquin Valley,
7 the Project area has relatively high quality groundwater with low salt concentrations (see
8 Section 13.1.4). Within Reach 2B, there is not an overall significant cumulative impact
9 on groundwater quality because of past, present, and reasonably foreseeable probable
10 future actions.

11 Seepage and waterlogging of crops along the San Joaquin River have historically been an
12 issue. High periodic streamflows and local flooding combined with shallow groundwater
13 near the San Joaquin River have resulted in seepage-induced waterlogging damage to low
14 lying farmland near the river. Seepage is highly variable and depends on annual
15 hydrologic conditions. Within portions of Reach 2B, depth to groundwater is relatively
16 shallow and has ranged from approximately 8 feet to 20 feet below ground surface (see
17 Section 13.1.4). In agricultural areas near the river, there is an overall significant
18 cumulative impact on groundwater because of past, present, and reasonably foreseeable
19 probable future actions (without consideration of any incremental change due to the
20 Project).

21 In the context of groundwater, applicable plans and projects referenced in the PEIS/R and
22 Section 25.2.2 include the Upper San Joaquin River Basin Storage Investigation, the
23 California Water Plan, the 20-Year Extension of the 2005 Mendota Pool Exchange
24 Agreement, and Common Restoration actions, which are physical actions to achieve the
25 Restoration Goal that would be implemented in other reaches. Additional projects
26 considered in Section 25.2.2 include general plan updates, transportation projects, a
27 pipeline project and a levee repair project, which overall may result in small effects to
28 groundwater levels and groundwater quality that are not cumulatively considerable when
29 taken together.

30 Under the Project alternatives, groundwater quality along the San Joaquin River in the
31 Project area would not be substantially degraded. Therefore, Project alternatives would
32 not result in a cumulatively considerable incremental contribution that would cause a
33 significant cumulative impact on groundwater quality. Shallow groundwater levels along
34 the San Joaquin River in the Project area would be monitored and flows would be
35 managed to reduce potential waterlogging of crop root zones with implementation of the
36 appropriate immediate mitigation measures. Therefore, Project alternatives would not
37 cause a cumulatively considerable incremental contribution to a significant cumulative
38 impact on shallow groundwater in the Project area. There are no other projects or
39 programs that when combined with the less-than-significant groundwater impacts
40 anticipated with the Project would result in cumulative impacts. In summary, the Project
41 would **not result in a cumulatively considerable incremental contribution** that would
42 cause cumulatively significant impacts to groundwater.

1 **25.5.11 Hydrology – Surface Water Resources and Water Quality**

2 Surface water quality in the Project vicinity has been affected by past and present projects
3 through changes in land use and hydrologic conditions. Much effort has been expended to
4 control discharges to the river and the levels and types of herbicides, fungicides, and
5 pesticides that can be used in the environment. Over time, regulatory requirements for
6 water quality in the river have become more stringent, and the number of locations along
7 the river at which specific water quality objectives are identified and monitored has
8 increased.

9 Impacts to surface water resources and water quality from implementing the Project
10 would include localized soil erosion, channel erosion and sediment transport, and impacts
11 to surface water quality from ground-disturbing construction activities. Construction
12 BMPs would be implemented to minimize the significance of these impacts.

13 Future foreseeable projects included in the cumulative impacts analyses, including the
14 Grassland Bypass Project and various total maximum daily load programs, would have a
15 beneficial effect on surface water quality in the Project vicinity by managing the quality
16 of runoff in the San Joaquin River watershed. In addition, other projects, such as the
17 Upper San Joaquin River Basin Storage Investigation, could provide additional benefits.
18 Construction activities within the watershed, however, could cause soil erosion and
19 sedimentation of local drainages connecting to the San Joaquin River and the inadvertent
20 introduction of construction-related substances into the San Joaquin River through site
21 runoff or on-site spills. The effects of past, present, and reasonably foreseeable probable
22 future actions have caused an overall significant cumulative impact on surface water
23 quality in the San Joaquin River.

24 However, none of the projects or plans referenced in the cumulative analysis contained in
25 the PEIS/R, or described in Section 25.2.2, would likely adversely affect surface water
26 resources in the Project area based on their location relative to the Project and their
27 intention to improve water quality conditions. Many programs occur downstream within
28 the Bay-Delta, while others occur elsewhere in the Central Valley. Therefore, these
29 projects or programs, when combined with the less-than-significant surface water
30 resources impacts anticipated with the Project (as outlined in Section 14.3.3), would not
31 result in cumulatively considerable impacts. In summary, the Project would **not result in**
32 **a cumulatively considerable incremental contribution** that would cause cumulatively
33 significant impacts to surface water resources under any of the Project alternatives (i.e.,
34 Alternatives A, B, C, and D).

35 **25.5.12 Hydrology – Wetlands and Aquatic Resources**

36 Several future actions have the potential to affect jurisdictional wetlands in Reach 2B.
37 These actions include a number of restoration programs and plans from which
38 jurisdictional wetland resources would benefit. In the context of jurisdictional wetlands,
39 applicable plans and projects referenced in the PEIS/R and Section 25.2.2 include:

- 40 • Conveyance of Refuge Water Supply, South San Joaquin Valley Study Area,
41 Mendota Wildlife Area.
42 • San Joaquin River Salinity Management Plan.

- 1 • San Joaquin River Water Quality Improvement Project.
- 2 • Comprehensive Conservation Management Plans for National Wildlife Refuges.
- 3 • Riparian Habitat Joint Venture.
- 4 • Fresno County General Plan.
- 5 • Madera County General Plan.

6 None of these plans is in conflict with the goals and intent of the Project. They include
 7 plans to ensure water deliveries to the Mendota Wildlife Area, improve water quality in
 8 the San Joaquin River, coordinate efforts to restore habitats and manage wildlife, and
 9 develop agriculture, while protecting water quality and habitats. Implementation of these
 10 plans (and the plans for restoration of the other reaches on the San Joaquin River under
 11 the No-Action Alternative) may be phased over many years, and may depend on the
 12 availability of funding or other resources. The benefits realized by these future plans may
 13 take years to be implemented.

14 Adverse effects on jurisdictional wetlands caused by the spread of non-native invasive
 15 plant species and further degradation of habitat have resulted from past actions and
 16 inactions and are likely to increase over time without invasive species management.
 17 Other projects could facilitate the dispersal and establishment of invasive plants in
 18 several ways: through transporting invasive plants' propagules into the Project area;
 19 creating bare ground for them to establish; altering hydrology in a manner that is
 20 advantageous to invasive plant species; and eliminating competing native vegetation.
 21 However, Program-level actions include management of invasive plant species in all
 22 Restoration reaches.

23 Implementing any of the Project alternatives would result in some less-than-significant
 24 adverse impacts, as well as in numerous beneficial effects on jurisdictional wetlands.
 25 Most adverse effects to jurisdictional wetlands would be local in scale and temporary,
 26 occurring during construction of Project infrastructure. The extensive conservation
 27 measures would reduce or minimize potential adverse effects. The beneficial effects of
 28 the Project alternatives would be regional and cumulative. For all Project alternatives, it
 29 is expected that restoration activities would improve jurisdictional wetlands conditions
 30 within and along the river. Control of invasive plant species would enhance the functions
 31 and values of jurisdictional wetlands throughout Reach 2B. Over time, native riparian
 32 vegetation would mature, prevent invasive exotic species to take hold by shading them
 33 out, and continue to contribute to the formation and expansion of high quality
 34 jurisdictional wetlands in the area. As a consequence, the overall effect of the
 35 implementation of Project alternatives on jurisdictional wetlands would be beneficial, and
 36 the Project would not contribute to significant adverse cumulative effects.

37 In summary, with implementation of the conservation strategy, the Project effects would
 38 be beneficial with a range from negligible to substantial benefits for jurisdictional
 39 wetlands. There **would not be a cumulatively considerable incremental contribution**
 40 to significant adverse effects on jurisdictional wetlands.

1 **25.5.13 Land-Use Planning and Agricultural Resources**

2 In the context of agriculture and land use, applicable plans and projects for the
3 cumulative effects analysis referenced in the PEIS/R and Section 25.2.2 include, but are
4 not limited to:

- 5 • Two Gates Fish Protection Demonstration Project.
- 6 • Conditional Waiver of Waste Discharge Requirements for Irrigated Lands.
- 7 • Comprehensive Conservation Management Plans for National Wildlife Refuges.
- 8 • San Joaquin River Parkway Plan.
- 9 • Fresno County General Plan.
- 10 • Madera County General Plan Policy Document.
- 11 • City of Mendota General Plan Update.
- 12 • 2030 Firebaugh General Plan.
- 13 • Grassland Bypass Project.

14 Many of the cumulative projects or plans referenced in the PEIS/R would not affect
15 agricultural resources and land use in the Project area based on their lack of proximity
16 relative to the Project. Plans and projects relevant to agricultural and land use in the
17 vicinity of the Project area include the city of Mendota General Plan Update and the 2030
18 Firebaugh General Plan.

19 For this analysis, cumulative effects with respect to agriculture and land use are
20 considered in the context of factors that affect agricultural production in the region,
21 including conversion of agricultural land to non-agricultural uses. Agricultural land
22 conversion has been ongoing throughout the region and State to accommodate growth
23 and population expansion into rural areas. The California Department of Conservation
24 (2013) estimates that approximately 8,500 acres of agricultural land was converted to
25 non-agricultural uses in Fresno County between 2008 and 2010; in Madera County, the
26 total was almost 1,100 acres. Agricultural land conversion is driven by development
27 projects and planning processes in rural areas where agricultural production is actively
28 occurring, including county-wide general plans that are intended to guide future growth
29 in both urban and agricultural areas. Other regional issues such as drought, environmental
30 restrictions, and economic recession have also affected agriculture in the region. Recent
31 droughts have reduced the amount of water available for redistribution throughout the
32 state. Many farm operations in the Central Valley faced reduced or eliminated water
33 supplies, which required agricultural land fallowing in many parts of California.

34 As described in this section, implementation of any of the Project alternatives (i.e.,
35 Alternatives A, B, C, or D) would result in significant and unavoidable impacts to
36 agricultural resources in the Project area related to conversion of agricultural land to non-
37 agricultural uses. Based on the information presented above, the Project would have an
38 adverse cumulative effect on agricultural resources when considered in the context of
39 downward trends in agricultural land (i.e., conversion to other uses) and agricultural
40 production in the region. In summary, there **would be cumulatively considerable**

1 **incremental contribution** to a significant cumulative impact to agricultural resources
2 under all of the Action Alternatives.

3 **25.5.14 Noise and Vibration**

4 Noise is a localized occurrence and attenuates rapidly with distance. Therefore, only
5 future projects in the immediate vicinity of the Project area would have the potential to
6 add to noise generated by Project activities and result in cumulative noise impacts.

7 Future construction activities in the Project vicinity that are conducted concurrent with
8 the construction of the Project would temporarily increase noise levels in surrounding
9 areas. Although many of the projects or plans described in the PEIS/R and Section 25.2.2
10 occur within the Bay-Delta or elsewhere in the Central Valley, proposed development
11 related to the buildout goals of the city of Mendota General Plan may generate types of
12 noise similar to those of the Project and development in the Project area and local vicinity
13 would have the potential to affect nearby sensitive receptors.

14 Simultaneous construction of these projects would increase noise levels, from onsite
15 construction and transport of materials. The worst case assumption indicates that
16 simultaneous construction could potentially increase source noise emissions by 3 A-
17 weighted decibels (dBA). If construction projects are implemented concurrently, the
18 combined cumulative effects could be above significance thresholds. If this were the
19 case, each project would need to mitigate individual noise effects which would decrease
20 overall cumulative effects. Construction involved with both the Project and any nearby
21 concurrent projects are temporary in nature and Project-related construction activities are
22 anticipated to be conducted during the daytime and during construction noise exempt
23 hours.

24 Construction noise and stationary-source noise can be controlled on-site at the point of
25 origin; however, traffic noise may extend beyond a project site along existing roadways,
26 resulting in significant traffic noise impacts on sensitive uses along those roadways. A
27 noise increase of up to 16 dBA Community Noise Equivalent Level (CNEL) from
28 construction-related truck traffic is anticipated with the Project, but these activities would
29 occur during construction exempt times.

30 The primary noise source due to operation of the Project would be generated by the
31 increase in traffic caused by the workers going to and from the Project site for operational
32 and maintenance activities. However, due to the limited number of truck trips, these
33 activities would not cause a noticeable change in traffic noise. Overall, the Project
34 alternatives **would not result in a cumulatively considerable incremental contribution**
35 that would cause a significant cumulative impact on noise.

36 Under Project Alternatives C and D, pile driving activities would temporarily increase
37 ground-borne vibration levels near an identified sensitive receptor, but Project mitigation
38 measures would reduce potential vibration-related effects to a less-than-significant level.
39 Other future projects would not cause vibration impacts within the immediate vicinity of
40 the Project work site. Therefore, the Project **would not result in a cumulatively**

1 **considerable incremental contribution** that would cause a significant cumulative
2 impact on vibration.

3 **25.5.15 Paleontological Resources**

4 The program Restoration Area is underlain by Pleistocene-age sediments of the Modesto
5 and Turlock Lake formations, which are considered paleontologically sensitive rock
6 units. The recovery of vertebrate fossils throughout the Sacramento and San Joaquin
7 valleys in sediments referable to these formations suggests that the potential exists to
8 uncover fossil remains during earthmoving activities of reasonably foreseeable future
9 projects. These projects include those listed in the PEIS/R, and those described in Section
10 25.2.2 (e.g., build-out of general plans and local projects such as Gill Ranch Gas Storage
11 Project and San Joaquin River Bank Repair Project).

12 If paleontological finds were to be encountered during Project construction, the potential
13 for cumulative impacts would exist within the context of the overall Restoration Area
14 (where other projects would proceed to construction). Project construction could
15 potentially add to a cumulative impact on paleontological resources. However, mitigation
16 measures would be implemented to salvage such resources within the Project area and
17 reduce potential impacts to a level that is less than significant. The mitigation measure
18 described in Section 18.3.2 (i.e., Mitigation Measure PAL-1) would effectively preserve
19 the value to science of any significant fossils uncovered during Project-related
20 construction.

21 Fossil discoveries resulting from excavation and earthmoving activities associated with
22 development are occurring with increasing frequency throughout the State. However,
23 unique, scientifically important fossil discoveries are relatively rare, and the likelihood of
24 encountering them is site-specific and is based on the type of specific rock formations
25 found underground, which vary from location to location. Furthermore, when unique,
26 scientifically important fossils are encountered by construction activities, the subsequent
27 opportunities for data collection and study generally provide a benefit to the scientific
28 community. Because of the low probability that any project would encounter unique,
29 scientifically important fossils, development of related projects and other development in
30 the region would not result in a cumulatively considerable impact on paleontological
31 resources. Therefore, the Project alternatives **would not result in a cumulatively**
32 **considerable incremental contribution** that would cause a significant cumulative
33 impact on paleontological resources.

34 **25.5.16 Public Health and Hazardous Materials**

35 In the context of public health and hazardous materials, applicable plans and projects for
36 the cumulative effects analysis referenced in the PEIS/R and Section 25.2.2 include, but
37 are not limited to, the conveyance of refuge water supply in the South San Joaquin Valley
38 Study Area to the Mendota Wildlife Area, habitat and conservation management plans,
39 transportation development projects, and the Gill Ranch Gas Storage project.

40 Actions associated with implementation of the Project could result in potentially
41 significant public health effects or safety hazards associated with exposure to hazardous
42 materials and disease vectors prior to implementation of Project mitigation measures.

1 However, Mitigation Measures HAZ-1 through HAZ-4 would be included to reduce
 2 potentially significant impacts of the Project alternatives related to exposure to hazardous
 3 materials and disease vectors. Implementation of these mitigation measures would serve
 4 to prevent the potential effects of the Project alternatives from contributing in a
 5 cumulatively considerable manner with other effects from past, present, or reasonable
 6 foreseeable probable future actions. The measures would reduce the contribution of the
 7 Project alternatives to these potentially significant cumulative effects. Therefore, the
 8 Project alternatives **would not result in a cumulatively considerable incremental**
 9 **contribution** that would cause a significant cumulative impact on public health and
 10 hazardous materials.

11 **25.5.17 Recreation**

12 In the context of recreation, applicable plans and projects for the cumulative effects
 13 analysis referenced in the PEIS/R include the Two Gates Fish Protection Demonstration
 14 Project, Lost Lake Park Master Plan, and San Joaquin River Parkway Plan. Additional
 15 plans and projects relevant to regional recreation include the America’s Great Outdoors
 16 Initiative and the San Joaquin River Blueway. At the local level, the city of Mendota
 17 General Plan Update also has implications for recreation near the Project area (referenced
 18 in Section 25.2.2).

19 None of the cumulative projects or plans referenced in the PEIS/R would affect
 20 recreation conditions in the Project area based on their location relative to the Project.
 21 The Two Gates Fish Protection Demonstration Project is located in the Sacramento-San
 22 Joaquin Delta well downstream of Reach 2B. Lost Lake Park is located near the
 23 community of Friant in unincorporated Fresno County, and along with the San Joaquin
 24 River Parkway Plan, covers recreation uses and activity upstream in Reach 1.

25 Working in conjunction with one another, America’s Outdoor Initiative and the San
 26 Joaquin River Blueway would improve recreation opportunities in the Restoration Area.
 27 The America’s Outdoor Initiative was launched in 2010 and calls for multiple federal
 28 agencies, including the Department of Interior, to implement projects that would promote
 29 conservation and recreation on public lands. One of the proposed projects under this
 30 initiative is the San Joaquin River National Blueway. The San Joaquin River National
 31 Blueway is an integrated system of “parks, wildlife refuges, and other publicly accessible
 32 places that provides the public an opportunity to explore and enjoy the San Joaquin River
 33 from its headwaters to the Delta” (San Joaquin River Partnership 2011). Recreation
 34 opportunities offered by the San Joaquin River National Blueway include boating,
 35 swimming, picnicking, walking and jogging, cycling, hiking, interpretive trails, wildlife
 36 viewing, bird watching, fishing and hunting. The San Joaquin River National Blueway
 37 plan identifies Fresno Slough (near the Mendota Wildlife Area) as an existing access site.

38 The city of Mendota General Plan addresses recreation uses within the city limits, which
 39 is located west of the Project Area. The Open Space and Conservation Element of the city
 40 of Mendota General Plan documents existing recreation resources in the planning area,
 41 including 26 acres of parks and recreation land. In addition, a range of goals, policies,
 42 and actions have been developed relative to parks, recreation, and open space, which
 43 generally are aimed at protecting recreation resources in an effort to meet the recreation

1 demand of local residents. Implementation of these goals, policies, and actions would
2 generate recreation benefits to the local area; no adverse effects on recreation resources
3 are expected.

4 Based on the information presented above, there are no projects or programs that when
5 combined with the less-than-significant recreation impacts anticipated with the Project
6 (as outlined in Section 20.3.3) would result in significant cumulative impacts. In
7 summary, the Project **would not result in a cumulatively considerable incremental**
8 **contribution** that would cause any cumulative impacts to recreation resources.

9 **25.5.18 Socioeconomics and Economics**

10 In the context of socioeconomics, applicable plans and projects for the cumulative effects
11 analysis referenced in the PEIS/R include the Bay-Delta Conservation Plan and
12 Alternative Delta Conveyance facilities, DMC/California Aqueduct Intertie, DMC
13 Project Recirculation, Two Gates Fish Protection Demonstration Project, Bay Area Water
14 Quality and Supply Reliability Program, and South Bay Aqueduct Improvement and
15 Enlargement Project. Additional plans and projects relevant to regional socioeconomic
16 conditions in the two-county region (referenced in Section 25.2.2) include the Grassland
17 Bypass Project. Many of the cumulative projects or plans referenced in the PEIS/R would
18 not affect socioeconomic conditions in the Project area based on their distance to the
19 Project.

20 The socioeconomic impact analysis presented in Chapter 21.0, “Socioeconomics and
21 Economics” addresses several types of potential impacts associated with the Project,
22 including changes in agricultural production values and new construction and operations
23 and maintenance expenditures, as well as related effects on the regional economy
24 covering Fresno and Madera counties. Chapter 21.0, “Socioeconomics and Economics”
25 also addresses effects on property tax revenues and changes in population and housing
26 demand. Of these impacts, the cumulative analysis focuses on regional economic effects
27 attributed to the removal of land from agricultural production, which is cumulatively
28 affected by other factors occurring throughout the region.

29 For the cumulative impact analysis, the Project’s incremental small economic effects
30 have been considered in the context of the regional economic impacts of changes in
31 agricultural production occurring elsewhere in the region. Due to large fluctuations in
32 available agricultural water supplies and declining soil quality elsewhere in the region
33 (and due to urban growth), the number of acres in agricultural production has declined in
34 the Central Valley over the past several years, including land in Fresno and Madera
35 counties. Declines in agricultural production adversely affect regional economic
36 conditions, including losses in jobs and income to local residents. These adverse effects
37 are realized not only in the agricultural sector, including agricultural landowners and
38 farm workers, but also have ripple effects throughout other agriculture-support industries
39 and the overall economy. Declining agricultural production is one contributing factor to
40 unemployment levels in the two-county region.

41 Implementation of the Project would result in relatively minor economic impacts
42 associated with losses in agricultural production when considered in the context of the

1 regional economy. The greatest impacts would occur under Alternative D, with total loss
2 of about 103 jobs and \$4.3 million in labor income in the two-county region annually.
3 However, when considered in the context of other economic drivers occurring elsewhere
4 in the region, such as declines in agricultural production elsewhere and a stagnant
5 housing market, the Project's incremental economic impacts are cumulatively
6 considerable. Accordingly, the Project's cumulative economic impact is substantial in the
7 short term; however, over the long term, the cumulative impact is moderated by
8 economic growth anticipated as the regional economy recovers from the recent recession.
9 In summary, the Project would result in a **cumulatively considerable incremental**
10 **contribution** to cumulative impacts to economic conditions in the region under all of the
11 Action Alternatives (i.e., Alternatives A, B, C, and D).

12 **25.5.19 Transportation and Traffic**

13 In the context of transportation and traffic, applicable plans and projects for the
14 cumulative effects analysis referenced in the PEIS/R and Section 25.2.2 include
15 transportation and development projects such as SR 33 Intersection Improvements, SR
16 180 Westside Expressway Route Adoption Study, and proposed development related to
17 the build-out goals of the city and county General Plans.

18 In consultation with Fresno Council of Governments (COG) and coordination with
19 County of Madera Planning staff, the latest approved version of the Fresno COG
20 transportation model was used to develop 2035 baseline conditions (which were
21 subsequently used to develop the No Action Alternative). The 2035 baseline condition
22 traffic growth projections captured all reasonably probable future actions of regional
23 significance within the Restoration Area and thus the traffic impact analysis conducted
24 for the Project alternatives is conservative and reflects worst case cumulative impact
25 conditions. Potential local unnamed future cumulative projects are also assumed to be
26 captured in the ambient traffic growth of 1 percent per year derived from the Fresno
27 COG' transportation model. Within the Restoration Area, there is a potential for
28 concurrent construction activities, however potential individual site impacts would be
29 dispersed due to timing, location and distance. The Project is not anticipated to cause an
30 increase in traffic which is substantial in relation to the existing traffic load and capacity
31 of the roadway system. Therefore, implementation of Project alternatives would not
32 provide a cumulatively considerable incremental contribution to traffic load.

33 However, the Project would result in a temporary or permanent road closure at river
34 crossings that may affect emergency access or emergency response times for fire units
35 and emergency responders providing mutual assistance to areas just north the river. This
36 potential effect remains significant, even after implementation of mitigation measures.
37 Therefore, all Action Alternatives **would result in one potentially significant and**
38 **unavoidable cumulative impact** to transportation and traffic, effects to emergency
39 access.

1 **25.5.20 Utilities and Service Systems**

2 For public utility and service systems, applicable plans and projects for the cumulative
3 effects analysis include:

- 4 • Fresno County General Plan.
- 5 • Madera County General Plan Policy Document.
- 6 • City of Fresno General Plan.
- 7 • Gill Ranch Gas Storage Project.
- 8 • Kerman Walmart Project.

9 The Gill Ranch Storage Project is located approximately 8 miles northeast of Mendota
10 Pool. The Kerman Walmart project is located 17 miles east of Mendota Pool. Past,
11 present, and reasonably foreseeable projects must be consistent with specific goals,
12 objectives, policies, and implementation measures of their respective county's general
13 plan. Each of the past, present and reasonably foreseeable projects, and planned
14 development generally, is required to evaluate whether sufficient public services and
15 utilities would be available and mitigate for significant effects where necessary.

16 As discussed in Chapter 23.0, "Utilities and Service Systems," the Project would not
17 increase demand for utility and service systems, such as fire protection, police protection,
18 emergency, schools, parks, libraries, water supply, wastewater and solid waste services.
19 However, fire and emergency response times to private property immediately north of the
20 river would be permanently increased due to the proposed closure of San Mateo Avenue
21 under Alternative D, and this would be a potentially significant, unavoidable impact.

22 None of the past, present, and reasonably foreseeable projects or plans referenced in the
23 PEIS/R would contribute to the demand for public utilities and services in the Project
24 area based on their location relative to the Project. Furthermore, the Project does not have
25 growth inducing effects.

26 Based on the information presented above, there are no projects or programs that when
27 combined with utilities and services impacts anticipated with the Project (as outlined in
28 Section 23.3.3) would result in significant cumulative impacts. In summary, the Project
29 **would not result in a cumulatively considerable incremental contribution** that would
30 cause cumulative impacts to utilities and service systems.

31 **25.5.21 Visual Resources**

32 In the context of aesthetics/visual resources, applicable plans and projects for the
33 cumulative effects analysis referenced in the PEIS/R and Section 25.2.2 include several
34 large projects in various stages of planning and implementation. Those projects include
35 the DMC Recirculation Project, the city of Stockton Delta Water Supply Project,
36 implementation of the Corps' policy on levee vegetation, and various proposed
37 residential, commercial, and industrial developments. Several large projects in various
38 stages of planning and implementation may have adverse impacts on visual resources.
39 Conversely, several projects in the planning stages within the Project area and vicinity
40 could have a beneficial effect on visual resources.

1 Development is increasingly changing the visual character of the Project vicinity from
2 vast areas of open space to urban uses, thus altering and limiting the views available to
3 recreationists and residents living in the area. This trend will continue as reasonably
4 foreseeable probable future projects are implemented in the Project vicinity. Substantial
5 changes in visual conditions will continue as agricultural lands and open space are
6 replaced by urban and industrial development and infrastructure projects, and as
7 vegetation is removed to make room for future development.

8 The cumulative effect of these changes on visual resources from past, present, and
9 reasonably foreseeable planned future projects would be significant. These cumulative
10 impacts can be minimized to a degree through vegetative and topographic screening of
11 structures, use of outdoor lighting that limits glare, appropriate building design, and other
12 measures such as restoration of disturbed areas; however, in many cases, the significant
13 cumulative impact cannot be mitigated to a less-than-significant level. Therefore, the
14 cumulative change of agricultural and open-space views in the Project vicinity to urban
15 landscape and the associated increase in nighttime light and glare and subsequent
16 skyglow would be significant (without consideration of any incremental change due to
17 the Project).

18 The release of Restoration Flows under the Project alternatives would provide a net
19 beneficial effect on visual resources by improving habitat along the San Joaquin River.
20 Less-than-significant Project impacts would occur due to construction of new
21 infrastructure. Potentially significant Project impacts could occur due to construction
22 related effects; however, mitigation measures would be implemented to reduce adverse
23 visual effects to less than significant levels. Overall, the Project alternatives **would not**
24 **result a cumulatively considerable incremental contribution** to the significant
25 cumulative impact on visual resources from the past, present, and foreseeable projects
26 and trends.

27

This page left blank intentionally.

1 **26.0 Other NEPA and CEQA**
 2 **Considerations**

3 In addition to the factors described in the preceding chapters, the California
 4 Environmental Quality Act (CEQA) requires consideration of significant and
 5 unavoidable impacts, National Environmental Policy Act (NEPA) requires consideration
 6 of the relationship of short-term uses and long-term productivity, and both NEPA and
 7 CEQA require consideration of irreversible and irretrievable commitments of resources
 8 as well as growth-inducing impacts. These considerations are described below.

9 **26.1 Significant and Unavoidable Impacts**

10 Section 21100, subdivision (b)(2)(A) of CEQA provides that an Environmental Impact
 11 Report (EIR) shall include a detailed statement setting forth “any significant effect on the
 12 environment that cannot be avoided if the project is implemented.” Chapters 4.0 through
 13 24.0 provide a detailed analysis of all potentially significant environmental impacts of
 14 implementing the Project, list feasible mitigation measures that could reduce or avoid the
 15 significant impacts of the Project alternatives, and specify whether these mitigation
 16 measures would reduce these impacts to a less-than-significant level. If a specific impact
 17 cannot be reduced to a less-than-significant level, it is considered a significant and
 18 unavoidable impact. As shown in Table 26-1, implementing the Project would have
 19 several significant and unavoidable environmental impacts.

Table 26-1.
Summary of Significant and Unavoidable Impacts

Impacts	Alternative	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Air Quality				
AQ-3: Expose Sensitive Receptors to Substantial Air Pollutants Associated with Construction	No-Action	No Impact	--	No Impact
	A	S	AQ-3A: Reduce Diesel Particulate Matter Emissions from Construction Equipment	SU
	B	S		SU
	C	S		SU
D	S	AQ-3B: Reduce Diesel Particulate Matter Emissions from Material Hauling Vehicles	SU	

**Table 26-1.
Summary of Significant and Unavoidable Impacts**

Impacts	Alternative	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Land Use Planning and Agricultural Resources				
LU-1: Removal of Land from Agricultural Production	No-Action	No Impact	--	No Impact
	A	S	LU-1: Preserve Agricultural Productivity of Designated Farmland to the Extent Possible	SU
	B	S		SU
	C	S		SU
	D	S		SU
LU-2: Conversion of Designated Farmland to Non-Agricultural Uses	No-Action	No Impact	--	No Impact
	A	S	LU-2: Preserve Agricultural Productivity of Designated Farmland to the Extent Possible	SU
	B	S		SU
	C	S		SU
	D	S		SU
LU-3: Conflict with Williamson Act Contracts	No-Action	No Impact	--	No Impact
	A	S	LU-3: Preserve Agricultural Productivity of Designated Farmland to the Extent Possible	SU
	B	S		SU
	C	S		SU
	D	S		SU
Transportation and Traffic				
TRA-4. Potential to Result in Inadequate Emergency Access	No-Action	No Impact	--	No Impact
	A	PS	TRA-4A: Provide Temporary Roadway and Crossing at San Mateo Avenue	SU
	B	PS	TRA-4B: Use Construction Sequencing to Provide Continuous Emergency Access at Drive 10 ½	SU
	C	PS	TRA-4A: Provide Temporary Roadway and Crossing at San Mateo Avenue	SU
	D	PSU	--	PSU

Key:

LTS = less than significant

PS = potentially significant

PSU = potentially significant and unavoidable

S = significant

SU = significant and unavoidable

- 1 Where feasible mitigation exists, it has been included to reduce these impacts; however,
- 2 the mitigation would not be sufficient to reduce these impacts to a less-than-significant
- 3 level. Chapter 25.0, "Cumulative Effects," describes the contribution of the Project to
- 4 effects caused, or would be caused, by past, present, and reasonably foreseeable future
- 5 actions.

1 **26.1.1 Construction-Related Air Pollutants**

2 Diesel fueled equipment emits the toxic air contaminant diesel particulate matter. Project
3 construction emissions were estimated for off-road construction equipment and material
4 hauling vehicles which are diesel fueled, and an exposure assessment and health risk
5 assessment was conducted for sensitive receptors in the Project area. Sensitive receptors
6 were found to have a significant increase in cancer risk for both a resident child and
7 school child exposure scenarios. Mitigation measures would be implemented to reduce
8 diesel particulate matter emissions from construction equipment and material hauling
9 vehicles. All off-road construction diesel equipment and material-hauling diesel
10 equipment would use the cleanest reasonably available equipment or consider alternative
11 fueled equipment or addition of after-market control devices (e.g., diesel particulate
12 filters). Material hauling trips would also be consolidated into the fewest trips possible. If
13 these mitigation measures reduce emissions by 85 percent, which is the maximum
14 estimated reduction when diesel particulate filters are used by all equipment and trucks,
15 the excess cancer risk for the resident child would still be above target values. This is due
16 to the size of the construction Project and the close proximity of the receptor to the
17 roadway.

18 **26.1.2 Agricultural Resources**

19 Project actions would remove substantial amount of agricultural lands from production,
20 including Prime Farmland, Farmland of Statewide Importance, and Unique Farmland,
21 and potentially conflict with Williamson Act contracts. Mitigation measures would
22 require the Project proponents to recognize and minimize adverse effects on agricultural
23 lands to the extent practicable. Measures include selection of borrow areas to minimize
24 fragmentation of agricultural lands; locating construction laydown and staging areas on
25 sites that are fallow, disturbed, or to be discontinued for use as agricultural land to the
26 extent possible, and using existing roads to access construction areas to the extent
27 possible; stockpiling of topsoil in designated farmland areas to be used in subsequent
28 habitat restoration, restoration of agricultural uses, or redistributed for agricultural
29 purposes; coordinate with landowners and agricultural operators to minimize
30 construction-related impairment of agricultural productivity; and providing access to
31 potential agricultural areas on the floodplain. The Project proponent would also acquire
32 agricultural conservation easements to be held by land trusts or public agencies or
33 provide funds to a land trust or government program that conserves agricultural lands.
34 However, implementation of these measures would not avoid the conversion of
35 agricultural land to non-agricultural uses or fully mitigate the loss of farmland and the
36 residual effect is significant and unavoidable.

37 **26.1.3 Emergency Response Times**

38 Project construction activities would create temporary or permanent roadway closures
39 that may affect emergency access/emergency response times to areas immediately north
40 of the San Mateo Avenue crossing or near Drive 10 ½. For those alternatives that
41 improve the San Mateo Avenue crossing, mitigation measures would require a temporary
42 roadway and crossing to allow for thru-traffic and access across levee, canal, and river
43 crossing construction areas, as applicable. The mitigation measure for Alternative B
44 requires construction sequencing to provide continuous emergency access at Drive 10 ½.
45 In both cases, local emergency dispatchers will be notified of temporary road closures.

1 No feasible mitigation exists for long-term impacts to emergency response times near
2 areas with permanent roadway closures.

3 **26.2 Relationship between Short-Term Uses and Long-Term** 4 **Productivity**

5 NEPA requires that an Environmental Impact Statement (EIS) consider “the relationship
6 between short-term uses of man’s environment and the maintenance and enhancement of
7 long-term productivity” (40 Code of Federal Regulations [CFR] 1502.16). Such
8 consideration involves using all practicable means and measures, including financial and
9 technical assistance, in a manner calculated to foster and promote the general welfare,
10 create and maintain conditions under which humans and nature can exist in productive
11 harmony, and fulfill the social, economic, and other requirements of present and future
12 generations of Americans.

13 Construction activities would include short-term uses of capital, labor, fuels, and
14 construction materials, as well as habitats, agricultural areas, and recreation areas.
15 General commitments of construction materials are largely irreversible because most of
16 the construction materials are unsalvageable (see Section 26.3, “Irreversible and
17 Irretrievable Commitments of Resources”). Construction would also result in short-term
18 construction-related effects such as interference with local traffic and circulation and
19 increased air emissions, ambient noise levels, dust generation, and disturbance of
20 wildlife. These effects would be temporary, occurring only during construction, and are
21 not expected to alter the long-term productivity of the natural environment.

22 In the short term, implementing the Project would directly increase demand for
23 construction and technical services. The additional economic activity in these sectors
24 could create jobs for construction contractors and workers, consulting engineers and
25 designers, environmental consultants, such as biologists, botanists, and ecologists, and
26 other personnel. It also would indirectly increase economic activity in industries that
27 provide construction materials and industries providing goods and services to
28 construction workers. In turn, the demand for these services could result in new jobs.
29 Conversely, agricultural production would be reduced in the short term as a result of the
30 loss and conversion of currently productive farm and rangeland to restoration uses. The
31 reduction of productive agricultural land would result in fewer jobs in the agricultural
32 sector. The effects of Project implementation on employment and economic activity are
33 discussed in Chapter 21.0, “Socioeconomics and Economics.”

34 Long-term productivity resulting from implementing the Project would increase in some
35 cases and would decrease or remain unchanged in others. The short-term increase in
36 construction-related economic activity would not be sustained over the long term.
37 Implementation of the Project would also permanently remove lands adjacent to the river
38 from agricultural production.

39 Within the Project area, Project implementation would result in other long-term effects,
40 such as increased riparian habitat, increased recreational opportunities and use of existing

1 facilities, and improved visual experience both for recreationists and adjacent
2 landowners. No identified adverse effects would pose a long-term risk to human health
3 and safety.

4 In summary, the short-term uses would generate regional economic activity that would
5 decrease over the long term as construction activities are completed. The benefits of
6 aquatic and riparian habitat restoration, self-sustaining salmon populations, and increased
7 recreational opportunities are substantial and would continue into the long term.
8 Implementing the Project, including implementation of mitigation as described in this
9 Environmental Impact Statement/Report (EIS/R), would foster and promote the general
10 welfare, create and maintain conditions under which people and nature can exist in
11 productive harmony, and fulfill social, economic, and other requirements of present and
12 future generations.

13 **26.3 Irreversible and Irretrievable Commitments of** 14 **Resources**

15 NEPA requires that an EIS include a discussion of the irreversible and irretrievable
16 commitments of resources that may be involved should an action be implemented.
17 Similarly, the State CEQA Guidelines (§ 15126, subd. (c)) require that an EIR include a
18 discussion of the significant irreversible environmental changes that would be caused by
19 a proposed project should it be implemented.

20 An irreversible and irretrievable commitment of resources is the permanent loss of
21 resources for future or alternative purposes. Irreversible and irretrievable resources are
22 those that cannot be recovered or recycled, or those that are consumed or reduced to
23 unrecoverable forms. The proposed action would result in the irreversible and
24 irretrievable commitment of the following:

- 25 • Construction materials.
- 26 • Nonrenewable energy.
- 27 • Land area and associated agricultural resources committed to restoration use.

28 Project activities under all Project alternatives would commit material resources to the
29 construction of new facilities. Under all Project alternatives, construction materials would
30 be committed to a variety of actions that would construct or modify existing facilities.
31 With the exception of fill material, the San Joaquin River Restoration Program (SJRRP)
32 would commit only a small quantity of these material resources relative to projected
33 residential, commercial, industrial, and institutional development. Therefore, the
34 commitment of these material resources would not result in a permanent loss of this
35 resource for the future or alternative purposes.

36 A substantial amount of material resources committed as a result of the Project
37 alternatives would be fill material (soil, and to a much lesser extent, rock aggregate)
38 primarily for earthen levee construction. The Fresno area is projected to have less than 10

1 years of permitted aggregate resources remaining, based on projected population growth
2 (Kohler 2006). The SJRRP is not accounted for in that 10-year estimate of demand for
3 aggregate resources. Therefore, if aggregate material is obtained from commercially
4 available sources, the commitment of this aggregate material to actions could result in a
5 permanent loss of this resource for the future or alternative purposes, such as for private
6 development. However, if aggregate material is not obtained from existing commercial
7 sources, that is, if this fill material is obtained from private or public lands, the SJRRP
8 would not commit aggregate resources that would deprive other purposes.

9 Implementing Project actions would commit nonrenewable energy in the form of
10 electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles that
11 would be needed for the construction, operation, and maintenance of actions. However,
12 these commitments of nonrenewable energy resources used for implementing the Project
13 are not expected to adversely affect other activities that require electricity, gasoline,
14 diesel fuel, and oil.

15 The SJRRP would commit land to implementing the Project. Farm and rangeland
16 (including designated Farmland) would be converted to nonagricultural uses (e.g., levee
17 and bypass footprints, floodplain habitat). This conversion would be long-term but not
18 necessarily irreversible or irretrievable.

19 **26.4 Growth-Inducing Impacts**

20 NEPA requires that an EIS consider indirect effects of a project, which are often the
21 result of growth inducement. The State CEQA Guidelines require that an EIR discuss
22 how a project may induce growth (Cal. Code Regs., , tit. 14, §15126.2, subd. (d)). A
23 project will have a growth-inducing impact if it directly or indirectly:

- 24 • Removes obstacles to population or economic growth.
- 25 • Requires the construction of additional community service facilities that could
26 cause significant environmental effects.
- 27 • Encourages and facilitates other activities that would significantly affect the
28 environment, either individually or cumulatively.

29 In *Napa Citizens for Honest Government v. Napa County Board of Supervisors* (2001) 91
30 Cal. App. 4th 342, 367–371 (110 Cal. Rptr. 2d 579), the California Court of Appeal,
31 Fourth District, provided clear direction on the standards for disclosing growth-inducing
32 effects. The EIR must describe the directness or indirectness of the effect. It must also
33 describe the ability of the lead agency to forecast actual effects. Based on these factors,
34 the lead agency may consider mitigation measures for the anticipated effects. Growth-
35 inducing effects are evaluated for the alternatives in accordance with the California Court
36 of Appeal’s finding in *Napa Citizens for Honest Government v. Napa County Board of*
37 *Supervisors* (2001):

1 *Neither CEQA itself, nor the cases that have interpreted it, require an*
2 *EIR to anticipate and mitigate the effects of a particular project on*
3 *growth on other areas. In circumstances such as these, it is sufficient*
4 *that the Final Environmental Impact Report warns interested persons*
5 *and governing bodies of the probability that additional housing will be*
6 *needed so that they can take steps to prepare for or address that*
7 *probability. The Final Environmental Impact Report need not forecast*
8 *the impact that the housing will have on as yet unidentified areas and*
9 *propose measures to mitigate that impact. That process is best*
10 *reserved until such time as a particular housing project is proposed.*

11 None of the Project alternatives removes an obstacle to population or economic growth.
12 No utility (i.e., domestic water, wastewater treatment, sewer, or stormwater treatment)
13 expansion is proposed under any of the alternatives. No new, additional transportation
14 facilities are proposed, nor is there any proposal to increase the capacity of existing
15 facilities. In summary, implementing the Project would not induce growth because the
16 construction workforce would partially come from other areas and is expected to increase
17 demand only for temporary housing, such as hotels, motels and apartments, and increased
18 economic activity resulting from added recreation opportunities would not be of a
19 magnitude that would drive demand for new housing. Because service systems would not
20 be constructed or expanded, none of the alternatives would remove an impediment to
21 growth.

22 Project actions would not remove obstacles to growth or require construction of
23 additional community service facilities that could cause significant environmental effects.
24 Project actions would result in recreation opportunities that would not exist under the No-
25 Action Alternative. However, recreation opportunities would not be at a level that would
26 encourage or facilitate other activities that would significantly affect the environment,
27 either individually or cumulatively. Chapter 20.0, “Recreation,” describes existing
28 recreation opportunities in the Project area and estimates opportunities under the No-
29 Action condition. Chapter 20.0 “Recreation,” further describes how an increase in
30 recreational activity, particularly in fishing, boating, and nature watching, could occur in
31 the Project area. There would be insufficient economic activity to increase demand for
32 development above that anticipated by local land-use planning agencies.

33 **26.5 Preferred Alternative**

34 A meeting was held on January 29, 2013, in order to introduce the consensus-based
35 alternative concept and approach to the adjacent landowners, canal companies, irrigation
36 districts, levee districts, cities, and the Settling Parties. The consensus-based alternative
37 approach gave these entities the opportunity to provide input on the Project course of
38 action, and their input was considered during the identification of the preferred
39 alternative. Following several meetings with the individuals and groups listed above, U.S.
40 Department of the Interior, Bureau of Reclamation (Reclamation) and California State
41 Lands Commission (CSLC) identified a preferred alternative, Alternative B, based on the
42 input received on the Action Alternatives. The preferred alternative is preliminary, and a

1 final alternative will not be selected for implementation until consideration of comments
2 received on the public draft EIS/R.

3 Consistent with Council on Environmental Quality (CEQ) Guidelines for NEPA, 40 CFR
4 Part 46.425, and State CEQA Guidelines, the Final EIS/R will identify a preferred
5 alternative for implementation. The alternative selected for implementation will be
6 articulated in the Record of Decision, which will be completed no less than 30 days
7 following the release of the final EIS/R, and in the findings and other documents to
8 complete the CEQA process.

9 **26.6 Environmentally Preferable/Superior Alternative**

10 CEQ Regulations require identification of an environmentally preferable alternative, and
11 the State CEQA Guidelines require identification of an environmentally superior
12 alternative. However, the CEQ Guidelines and CEQA Guidelines do not require adoption
13 of the environmentally preferable/superior alternative as the preferred alternative for
14 implementation. The selection of the preferred alternative is independent of the
15 identification of the environmentally preferable/superior alternative, although the
16 identification of both is based on the information presented in this EIS/R.

17 Section 1505.2(b) of the CEQ Regulations requires the NEPA lead agency to identify the
18 environmentally preferable alternative in a Record of Decision. The CEQ Regulations
19 define the environmentally preferable alternative as "...the alternative that will promote
20 the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this
21 means the alternative that causes the least damage to the biological and physical
22 environment; it also means the alternative which best protects, preserves, and enhances
23 historic, cultural, and natural resources."

24 Similar to the environmentally preferable alternative under NEPA, the State CEQA
25 Guidelines, sections 15120 and 15126.6, subdivision (e)(2), require identification of an
26 environmentally superior alternative. If the environmentally superior alternative is the
27 "no project" alternative, the State CEQA Guidelines, section 15126.6, subdivision (e)(2),
28 require identification of an environmentally superior alternative among the action
29 alternatives.

30 To identify the environmentally preferable/superior alternative, each of the Project
31 alternatives is evaluated based on significance thresholds and the potential adverse
32 impacts identified. The relative potential for each action alternative to benefit the
33 resource areas is also identified. The action alternative(s) with the fewest adverse impacts
34 and greatest benefits (where applicable) is identified for each resource category, as
35 summarized below.

36 All of the Project alternatives would achieve implementation of Project goals. The
37 alternatives contribute to the success of these goals to varying extents. Under all action
38 alternatives, construction and long-term operations and maintenance impacts would occur
39 related to air quality, biological resources – fisheries, biological – vegetation, biological –

1 wildlife, climate change and greenhouse gases, cultural resources, environmental justice,
2 geology and soils, hydrology – flood management, hydrology – groundwater, hydrology
3 – surface water resources and water quality, land-use planning and agricultural resources,
4 noise and vibration, paleontological resources, public health and hazardous materials,
5 recreation, socioeconomics and economics, transportation and traffic, utilities and service
6 systems, and visual resources, compared to the No-Action Alternative or existing
7 conditions, as described in Chapters 4.0 through 24.0.

8 Alternative B is the environmentally preferable/superior alternative. All four Action
9 Alternatives have the same significant and unavoidable impacts for air quality and land
10 use. All four Action Alternatives have the same potentially significant and unavoidable
11 impacts for reduced emergency access. The only differences between the alternatives are
12 for less than significant impacts. Alternative A and Alternative B have less than
13 significant impacts related to visual impacts at Bass Avenue and water quality impacts of
14 agriculture on the floodplain. Alternative C has less than significant impacts related to
15 water quality from Mendota Dam modifications and visual impacts to both Mendota Pool
16 Park and the area around Mendota Dam. Alternative D has less than significant impacts
17 related to water quality impacts of agriculture on the floodplain, water quality impacts
18 due to Mendota Dam modifications, and visual impacts to both Mendota Pool Park and
19 the area around Mendota Dam. Alternative D has the widest levee alignment, but also
20 most environmental impacts due to its greater number of less than significant impacts.
21 Alternative A and B have the least environmental impacts, and the same ones. Alternative
22 B includes a wider floodplain levee alignment than Alternative A, improving Project
23 benefits to the fishery and environment. The Alternative B levee alignments have been
24 negotiated with landowners to minimize agricultural impacts while helping to meet
25 fisheries goals. Agriculture on the floodplain allows for flexibility for floodplain
26 management and minimizes the amount of agricultural land taken out of production. This
27 minimizes but does not eliminate the significant and unavoidable impacts to land use.
28 Agriculture in the floodplain adds less than significant impacts to water quality as a result
29 of pesticide runoff. The preferred alternative balances the needs of the Chinook salmon
30 fishery with local farming concerns.

31 **26.7 Least Environmentally Damaging Practicable**
32 **Alternative**

33 The SJRRP is working closely with Federal, State, and regional agencies to meet
34 regulatory requirements and to avoid and minimize impacts and, where necessary, to
35 reach agreement on mitigation measures for impacts that cannot be avoided. One
36 important process that integrates many of the applicable regulatory requirements is the
37 Section 404(b)(1) process, as managed by the United States Army Corps of Engineers
38 (Corps) with oversight from the U.S. Environmental Protection Agency (EPA). The
39 404(b)(1) process considers if the range of potential alternatives evaluated in the EIS/R is
40 an appropriate range of “reasonable” and “practicable” alternatives using the best
41 available information. The Corps then determines the Least Environmentally Damaging
42 Practicable Alternative (LEDPA) to meet requirements of NEPA, Sections 401 and 404

1 of the Clean Water Act, and Section 14 of the Rivers and Harbor Act, with consideration
2 of compliance with the Federal Endangered Species Act and the National Historic
3 Preservation Act. The Corps' 404(b)(1) LEDPA determination is expected to be attached
4 to the final EIS/R.

5 **26.8 Comparison of Action Alternatives**

6 Table 26-2 provides a comparison of some of the features of the Action Alternatives.
7 Table 26-3 summarizes some of the conditions that were used to evaluate impacts and
8 benefits of the Action Alternatives. These features are discussed below by resource area
9 in order to compare impacts and benefits among the Action Alternatives.

10 **26.8.1 Air Quality**

11 Action Alternatives would result in significant and unavoidable impacts to sensitive
12 receptors due to temporary and short-term construction-related emissions of the toxic air
13 contaminant diesel particulate matter. Alternatives A and B would impact sensitive
14 receptors (i.e., resident child and school child) to a greater degree than Alternatives C and
15 D. Alternative B would cause the greatest impact to the potential resident child, while
16 Alternative A would have the greatest impact to the school child (see Table 26-3).

17 All of the Project alternatives would have construction-related impacts associated with
18 nitrogen oxides and reactive organic gas and long-term reductions in agricultural
19 emissions. Without implementation of mitigation measures, Project alternatives could
20 create significant amounts of construction-related criteria air pollutants and conflict with
21 an applicable plans or policies related to air quality. Alternative A would have the most
22 adverse impacts from construction emissions because it requires the most construction
23 activity (i.e., activity associated with offroad construction equipment, material hauling
24 vehicles, worker commute vehicles, and fugitive dust emissions). Conversely, Alternative
25 C would have the least adverse impacts because it requires the least construction activity.
26 Overall, Alternative C would provide the least adverse impact to air quality (Table 26-3).

27 **26.8.2 Biological Resources – Fisheries**

28 Action Alternatives provide benefits to fisheries, such as fish passage through Reach 2B
29 and increased floodplain area for primary production (i.e., food) or rearing habitat.
30 Alternative D provides the greatest benefits for primary production, Alternative B
31 provides the greatest benefits for rearing habitat, and Alternative D provides the most
32 advantageous fish passage conditions (e.g., the fewest structures and jumps) (Table 26-3).

33 Adverse impacts to fisheries include effects from in-channel construction activities and
34 effects from agricultural activities on the floodplain. All Action Alternatives would
35 include in-channel construction activities. Alternatives A, B, and D would allow
36 agricultural activities on the floodplain after construction is complete which could impact
37 fishery resources while Alternative C would not allow these activities.

1
2

**Table 26-2.
Levees, Land Acquisition, and Construction Duration**

Category	Unit of Measure	Alternative A	Alternative B	Alternative C	Alternative D
Left Levee Length	miles	8.7	8.1	7.7	7.2
Left Average Levee Height	feet	5.8	5.6	5.6	5.2
Left Fill Volume	cubic yards	345,200	328,600	317,500	272,000
Right Levee Length	miles	7.1	6.8	6.9	6.6
Right Average Levee Height	feet	5.4	4.7	5.2	4.2
Right Fill Volume	cubic yards	269,700	226,900	224,500	188,250
Land Acquisition ¹	acres	2,700	2,900	2,450	3,300
Time to Build ²	months	132	157	157	158

¹ Land acquisition total includes areas that may be State of California sovereign lands or public trust lands.

² Construction timeline does not include the time that would also be needed to obtain permits, appraise and acquire land, and perform pre-construction surveys.

**Table 26-3.
Features and Conditions of the Action Alternatives**

Resource Area	Category	Criteria	Unit of Measure	Alternative A	Alternative B	Alternative C	Alternative D
Air Quality	Construction Emissions	Average Annual Construction Emissions for NOx	tons per year	299	281	208	217
		Average Annual Construction Emissions for ROG	tons per year	19	18	13	14
	Sensitive Receptors	Increased Cancer Risk for the Resident Child	in a million	77	78	62	71
		Increased Cancer Risk for the School Child	in a million	60	55	37	38
Fisheries	Floodplain characteristics	Primary production (<1.0 feet inundation at 2,500 cfs)	acres	470	440	520	740
		Rearing habitat (>1.0 feet inundation at 2,500 cfs)	acres	380	560	230	310

**Table 26-3.
Features and Conditions of the Action Alternatives**

Resource Area	Category	Criteria	Unit of Measure	Alternative A	Alternative B	Alternative C	Alternative D
Fisheries	Fish passage conditions	Maximum number of steps at structures	number of jumps	43	54	59	36
		Potential predation sites	number of artificial structures	21	9	7	7
Vegetation	Sensitive natural vegetation communities	Construction impacts - Infrastructure	acres	44	31	37	47
		Construction impacts - Floodplain	acres	270	300	305	299
		Habitat restoration estimates	acres	≤1,420	≤1,970	≤1,450	≤2,000
Wildlife	Special-species wildlife habitat impacts	Giant garter snake	acres	460	429	519	523
		Swainson's hawk	acres	1,340	1,267	1,252	1,431
	Restoration estimates	Special-status species habitat extent	acres	≤1,070	≤1,640	≤1,050	≤1,630
		Wildlife habitat	acres	≤1,330	≤1,870	≤1,360	≤1,900
Greenhouse Gas	Construction emission	Average CO _{2e} emissions	metric tons per year	47,817	45,080	33,066	34,580
Cultural Resources	Potential impacts	Impacts to historical properties	number of listed properties	0	0	1	1
Groundwater	Shallow groundwater	Groundwater <5 feet	acres	320	360	330	330
		Groundwater 5-7 feet	acres	60	80	70	70
Wetlands	Potential impacts	Riparian, wet meadows, marshes, and other waters of the United States (excluding potential borrow areas)	acres	656	582	746	762
	Restoration estimates	Wetlands and other waters with hydric soils (excluding potential borrow areas)	acres	≤720	≤840	≤760	≤880
Land Use	Permanent loss of designated Farmland	Future infrastructure/floodplain habitat	acres	1,000	786	1,218	1,143
		Other floodplain areas	acres	≤480	≤786	0	≤862
		Borrow areas	acres	≤350	≤350	≤350	≤350

**Table 26-3.
Features and Conditions of the Action Alternatives**

Resource Area	Category	Criteria	Unit of Measure	Alternative A	Alternative B	Alternative C	Alternative D
Noise and Vibration	Potential impacts	Maximum change in community noise equivalent levels from construction traffic	dBA	16	16	15	15
Socioeconomics and Economics	Economic effects	Agricultural production annual values	millions	-\$6.6	-\$7.6	-\$6.0	-\$9.1
		Agricultural employment	number	-75	-85	-67	-103
		Construction output	millions	\$68	\$52	\$65	\$55
		Construction employment	number	293	244	287	258
Transportation and Traffic	Potential impacts	Maximum increase in traffic on Project roadway segments	ADT	6,036	5,688	4,383	4,377
Utilities and Service Systems	Relocations	Electrical Distribution	feet	43,500	48,500	48,000	68,000
		Gas Transmission	feet	10,000	11,000	9,000	11,500
		Water Pipeline	feet	31,000	41,000	33,000	50,000
		Canal	feet	32,500	31,500	32,500	56,000
		Culvert	number	1	1	1	1
		Diversion	number	3	3	3	3
		Barn/Shed	number	1	1	1	1
		Facility	number	1	1	1	1
		Groundwater Well	number	26	32	25	32
		Lift Pump	number	10	10	10	10
		Power Pole	number	144	162	166	239
Dwelling	number	2	2	2	2		

ADT = average daily traffic

dBA = A-weighted decibel(s)

CO₂e = carbon dioxide equivalents

1 **26.8.3 Biological Resources – Vegetation**

2 Action Alternatives would impact riparian habitat and other special-status vegetation
3 alliances during construction of the Project and facilitate the increase in distribution and
4 abundance of invasive plant species in the Project area. Alternatives C and D would
5 impact more acreage of special-status vegetation alliances than Alternatives A and B
6 (Table 26-3). However, conservation measures would be implemented that would offset
7 potential adverse effects on special-status vegetation alliances and control the spread and
8 introduction of invasive plants.

9 Project alternatives would provide benefits to riparian habitat and other sensitive
10 vegetation resources and would enhance opportunities to implement conservation
11 strategies and attain conservation goals for sensitive vegetation. Alternative B provides a
12 wide, consensus-based floodplain with a mixture of active and passive riparian and
13 floodplain habitat restoration and compatible agricultural activities. Alternative D also
14 provides a wide floodplain which could provide substantial restoration opportunities
15 (Table 26-3) but has passive restoration. The other alternatives provide a narrow
16 floodplain and/or passive riparian habitat restoration and farming in the floodplain.
17 Overall, Alternative B could provide the greatest benefits and least adverse impacts to
18 vegetation.

19 **26.8.4 Biological Resources – Wildlife**

20 Action Alternatives would impact habitat used by special-status wildlife species.
21 Alternative B could have the most adverse impacts to wildlife because this alternative
22 would have the most potential impact to special-status wildlife species habitat prior to
23 implementation of Project conservation measures. However, conservation measures
24 would be implemented to avoid and minimize adverse impacts to special-status species
25 and therefore estimates for habitat impacts are conservative for the Action Alternatives.

26 Alternatives B and D would potentially impact species habitat with Project infrastructure
27 to a greater extent than Alternative A and C. Alternative B would also have the greatest
28 potential for impacting species habitat on the floodplain which would later be restored.
29 Alternative A would, on average, have the least impact from Project infrastructure and
30 temporary construction areas (but possibly the largest impact from borrow areas).
31 However, Alternative A would have the most elderberry shrubs removed to accommodate
32 Project infrastructure. Alternative C would have the least impact on species habitat
33 considering all potential long-term and short-term habitat impacts.

34 Project alternatives would include long-term benefits to wildlife associated with
35 enhanced riparian and floodplain vegetation within Reach 2B. Alternative C provides
36 active riparian and floodplain habitat restoration and Alternative B provides a mixture of
37 active and passive riparian and floodplain restoration and compatible agricultural
38 activities, while Alternatives A and D provide passive riparian habitat restoration and
39 agricultural practices in the floodplain. Alternative B could provide the greatest benefits
40 associated with habitat restoration (Table 26-3).

1 Project alternatives would cause temporary and intermittent impacts on wildlife
 2 movement corridors as a result of Project construction. However, post-project conditions
 3 would most likely improve habitat for migrating species, particularly for Alternatives B
 4 and C which provide active habitat restoration or a mixture of active and passive habitat
 5 restoration.

6 **26.8.5 Climate Change and Greenhouse Gas Emissions**

7 Action Alternatives could create significant amounts of construction-related greenhouse
 8 gas (GHG) emissions without implementation of mitigation measures. Alternative A
 9 would have the most adverse impacts to climate change because it requires the most
 10 construction activity (i.e., activity associated with offroad construction equipment,
 11 material hauling vehicles, and worker commute vehicles). Conversely, Alternative C
 12 would have the least adverse impacts to climate change because it requires the least
 13 construction activity (see Table 26-3). Project operation-related GHG emissions would be
 14 similar for the Action Alternatives.

15 Project alternatives would provide benefits to climate change by increasing riparian and
 16 floodplain habitat, which has the capacity to absorb some GHGs. Over the long term,
 17 increased wetland and riparian zones would likely result in a decrease in GHG emissions
 18 relative to managed agriculture. Alternatives B and D would provide more floodplain
 19 habitat and potentially more carbon sequestration than Alternatives A and C.

20 **26.8.6 Cultural Resources**

21 Action Alternatives could impact archaeological resources if encountered during ground
 22 disturbing construction activities, particularly if borrow areas are located near identified
 23 archaeological resources, such as CA-FRA-45 and CA-FRA-106. Project mitigation
 24 measures would be implemented under all of the Action Alternatives to reduce potential
 25 impacts to archaeological resources.

26 Potential adverse effects to historical properties could occur through substantial
 27 alterations or changes to the historical setting. Of particular concern are properties listed
 28 or eligible for listing in the National or California Register. Alternatives C and D include
 29 changes to Mendota Dam and the outlet of the Delta-Mendota Canal, both of which are
 30 listed in the National and/or California Register, while Alternatives A and B do not
 31 modify these historical properties.

32 **26.8.7 Environmental Justice**

33 Project alternatives could have disproportionately high and adverse effects on
 34 environmental justice communities of concern (i.e., disadvantaged populations) as a
 35 result of removal of land from agricultural production, conversion of designated farmland
 36 to nonagricultural uses, cancellation of Williamson Act contracts, and the resultant
 37 changes in agricultural jobs and the regional economy. Alternative D would have the
 38 most adverse effects to farm-level jobs and the regional agriculturally influenced
 39 economy. Alternative C would have the least adverse effect to farm-level jobs and
 40 regional economy (see Table 26-3).

1 Project alternatives also have the potential for disproportionately high and adverse effects
2 on environmental justice communities of concern as a result of construction-related
3 emissions of criteria air pollutants and precursors and exposure of sensitive receptors to
4 substantial concentrations of toxic air contaminants. Alternatives A and B would impact
5 sensitive receptors to a greater degree than Alternatives C and D. Alternative A would
6 have the most adverse impacts from construction emissions and Alternative C would
7 have the least adverse impacts (see Table 26-3).

8 **26.8.8 Geology and Soils**

9 Action Alternatives would have similar impacts to geology and soils. Impacts from
10 borrow areas would be similar for all of the Action Alternatives (up to 350 acres of land
11 would be needed for borrow areas under any alternative). Erosion effects could occur, but
12 standard erosion protection measures would be implemented under each alternative.
13 Adverse soil conditions may also occur, but again, the Project would implement
14 appropriate design measures under all Project alternatives.

15 **26.8.9 Hydrology – Flood Management**

16 Action Alternatives would have similar impacts and benefits to flood management.
17 Project alternatives would impact flood management by temporarily limiting access to
18 levees and facilities for maintenance and inspection staff. Diversion structures and fish
19 passage facilities could also create localized backwater and redirection effects, though
20 levee heights would be designed to accommodate such effects. Project alternatives would
21 provide flood management benefits by increasing flood conveyance capacity in Reach
22 2B.

23 **26.8.10 Hydrology – Groundwater**

24 Project alternatives would have similar impacts to groundwater. Construction associated
25 with channel and structural improvements could lead to changes in groundwater quality,
26 however, mitigation measures would be implemented to reduce or avoid impacts.

27 Project alternatives could cause increased groundwater levels in areas outside of the
28 floodplain levees. Alternative B may cause more areas to have shallow groundwater than
29 the other alternatives (i.e., depth to groundwater less than 5 feet) (Table 26-3). However
30 seepage management measures would be implemented during Project design and
31 operations and would be included, as necessary, in Project areas where under-seepage is
32 likely to affect adjacent land uses. Seepage control measures could include slurry walls,
33 seepage wells, seepage berms, land acquisition (fee title or seepage easements), and other
34 measures.

35 **26.8.11 Hydrology – Surface Water Resources and Water Quality**

36 Alternatives C and D could have more adverse impacts to geomorphology than
37 Alternatives A and B because additional channel bed degradation may occur during
38 Restoration Flows as the upstream channel adjusts to the lowered base-level control
39 resulting from modifications to Mendota Dam. This potential effect would be minimized
40 by floodplain grading during construction.

1 Similarly, Alternatives C and D could have more adverse impacts on water quality than
 2 Alternatives A and B because of mobilization of contaminated sediments in the San
 3 Joaquin arm of Mendota Pool. However, long-term agricultural activities in the
 4 floodplain would have more adverse effects on water quality in Alternatives A, B, and D
 5 than in Alternative C. Agricultural fields in the floodplain could convey agricultural
 6 return flows (if not recaptured for reuse) and runoff to the river which can contain
 7 nutrients and pesticides.

8 **26.8.12 Hydrology – Wetlands and Aquatic Resources**

9 Alternatives C and D would potentially result in the most adverse impacts to wetlands
 10 because these alternative could impact more wetland area than Alternatives A and B
 11 (Table 26-3). However, conservation measures would be implemented to avoid,
 12 minimize, or compensate for adverse effects on waters of the United States and waters of
 13 the State, including wetlands, and these measures would be implemented as part of the
 14 Action Alternatives. Alternatives B and D would provide more opportunities for
 15 restoration of wetlands and other waters with hydric soils than Alternatives A and C (see
 16 Table 26-3). Overall, Alternative B would have the least adverse impacts to wetlands and
 17 other waters of the United States while providing more restoration opportunities for
 18 wetlands and other waters with hydric soils.

19 **26.8.13 Land-Use Planning and Agricultural Resources**

20 Action Alternatives would impact land-use planning and agricultural resources as a result
 21 of removal of land from intensive agricultural production, conversion of designated
 22 farmland to nonagricultural uses, cancellation of Williamson Act contracts, degradation
 23 of agricultural land productivity, and conflicts with applicable land use plans. Alternative
 24 B would have the least adverse impact to land-use planning and agricultural resources
 25 due to the permanent loss of designated Farmland (see Table 26-3).

26 **26.8.14 Noise and Vibration**

27 Action Alternatives have similar noise-related impacts, with Alternatives A and B having
 28 slightly more adverse effects than Alternatives C and D due to traffic-related noise during
 29 construction activities (Table 26-3). Alternatives C and D have greater vibration-related
 30 impacts than Alternatives A and B due to proximity of pile driving activities near
 31 sensitive receivers.

32 **26.8.15 Paleontological Resources**

33 Action Alternatives could impact paleontological resources if encountered during ground
 34 disturbing construction activities. Project mitigation measures would be implemented to
 35 reduce potential impacts and therefore potential impacts from Project alternatives are
 36 similar.

37 **26.8.16 Public Health and Hazardous Materials**

38 Action Alternatives could impact public health and hazardous materials by creating or
 39 exposing new hazards or by exposing construction workers or the public to existing
 40 hazards. Mitigation measures would be implemented under the Action Alternatives to
 41 avoid or minimize these effects. Therefore Project alternatives would have similar
 42 effects.

1 **26.8.17 Recreation**

2 Action Alternatives would have some beneficial impacts to recreation through enhanced
3 fisheries-based recreation opportunities. Alternatives B and D would have more adverse
4 impacts to recreation than Alternatives A and C because these alternatives have the
5 longest construction periods (see Table 26-2). Alternative A would have the least adverse
6 impacts to recreation because this alternative has the shortest construction period.

7 **26.8.18 Socioeconomics and Economics**

8 Action Alternatives would provide some employment benefits and beneficial regional
9 economic effects due to construction activities and Project operation, with Alternative A
10 providing the most benefits. Project alternatives would impact agricultural production
11 and agricultural related employment. Alternative D would have the most adverse long-
12 term effects on agricultural production and employment, while Alternative C would have
13 the least adverse long-term effects (Table 26-3).

14 **26.8.19 Transportation and Traffic**

15 Alternative A would have the most adverse impacts to transportation and traffic due to
16 added construction-related traffic to the roadway circulation system (i.e., San Mateo
17 Avenue, SR 33, and SR 180). Alternatives C and D would have the least adverse
18 impacts to transportation and traffic due to construction-related traffic (see Table 26-3).

19 Action Alternatives would also create a temporary roadway closure that may affect
20 emergency access/emergency response times to areas immediately north of the San
21 Mateo Avenue crossing. Alternatives D and B would also create a permanent roadway
22 closure at San Mateo Avenue crossing and Alternative A would result in a permanent
23 roadway closure at Drive 10 ½ (which is only used for emergency access). Overall,
24 Alternative C would provide the least adverse impacts to transportation and traffic.

25 **26.8.20 Utilities and Service Systems**

26 Many of the Project impacts to utilities and service would be the same for the Action
27 Alternatives. To minimize and avoid disruption of subsurface utilities from ground
28 disturbing activities, Project proponents would confirm the location of existing
29 underground utilities; coordinate with the owners of transmission lines and pipelines;
30 design restoration actions to avoid affecting underground facilities, if feasible; and
31 coordinate with the utility owner to shut off and relocate the utilities, if necessary.
32 Therefore Project alternatives would have similar effects.

33 **26.8.21 Visual Resources**

34 Action Alternatives would create similar construction-related impacts to visual resources
35 and mitigation measures would be implemented to minimize these effects. Long-term
36 effects to visual quality at the San Mateo Avenue crossing would improve with any of the
37 Action Alternatives. Alternatives C and D would impact visual resources at Mendota
38 Pool Park and the Mendota Dam area while Alternative A and B would not impact visual
39 resources in these areas. Conversely, Alternatives A and B would impact visual resources
40 at the Bass Avenue Residential Area, while Alternatives C and D would not cause
41 impacts in this area.

1 **26.9 Mitigation Monitoring and Reporting Program**

2 The requirement for a mitigation monitoring or reporting program is introduced in the
 3 State CEQA Guidelines (Cal. Code Regs., tit. 14, §15091). This section of the State
 4 CEQA Guidelines directs the public agency approving or carrying out the Project (CSLC,
 5 as the State lead agency) to make specific written findings for each significant impact
 6 identified in the EIR. When making the required findings, the agency will also adopt a
 7 program for reporting on or monitoring the changes that it has either required in the
 8 Project or made a condition of approval to avoid or substantially lessen significant
 9 environmental effects. These mitigation measures must be fully enforceable through
 10 permit conditions, agreements, or other measures.

11 Section 15097 was added to the State CEQA Guidelines on October 23, 1998. It requires
 12 the public agency to adopt a program for monitoring or reporting on the revisions that it
 13 has required in the Project and the measures it has imposed to mitigate or avoid
 14 significant environmental effects. Reporting or monitoring responsibilities may be
 15 delegated to another public agency or private entity. However, until mitigation measures
 16 have been completed, the State lead agency (CSLC) remains responsible for ensuring that
 17 implementation of the mitigation measures occurs in accordance with the program.

18 The CSLC may choose whether its program will monitor mitigation, report on mitigation,
 19 or both.

- 20 • Reporting generally consists of a written compliance review that is presented to
 21 the decision-making body or authorized staff person. A report may be required at
 22 various stages during project implementation or upon completion of the
 23 mitigation measure. It is suited to projects that have readily measurable or
 24 quantitative mitigation measures or that already involve regular review.
- 25 • Monitoring is generally an ongoing or periodic process of project oversight. It is
 26 suited to projects with complex mitigation measures that are expected to be
 27 implemented over a period of time.

28 The public is allowed access to records and reports used to track the monitoring program.
 29 Monitoring records and reports will be made available for public inspection by the CSLC
 30 or its designee on request.

31 **26.9.1 Matrix**

32 The mitigation monitoring and reporting program for the Project is provided in Table 26-
 33 4, below. Table 26-4 includes all Project impacts that were identified as significant or
 34 potentially significant. Impacts that are significant or potentially significant, but
 35 unavoidable, are those where no mitigation can reduce the impact to a less-than-
 36 significant level. For impacts that are less than significant, mitigation is not required by
 37 CEQA. A complete description of each impact and mitigation measure is found in the
 38 previous chapters of this EIS/R.

39 For each impact and mitigation measure, the matrix identifies the location where the
 40 impact occurs and where the mitigation measure should be applied; the

San Joaquin River Restoration Program

- 1 monitoring/reporting action to be taken by the monitor or lead agency; the effectiveness
- 2 criteria; the agency responsible for ensuring that the action occurs; and the timing
- 3 requirements for implementation. In most cases, the Reclamation and/or the CSLC are
- 4 responsible for evaluating monitoring data and compliance with program requirements.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Biological Resources – Fisheries, Biological Resources – Vegetation, Biological Resources – Wildlife, Climate Change and Greenhouse Gas Emissions, Geology and Soils, Hydrology – Flood Management, Hydrology – Wetlands and Aquatic Resources, Socioeconomics and Economics and Utilities and Service Systems – These sections contain no mitigation measures for the Project impacts.						
Air Quality						
Impact AQ-1: <i>Create Excess Amounts of Construction Related Criteria Air Pollutants that Exceed SJVAPCD Thresholds of Significance or Cause or Contribute to Exceedances of the AAQS.</i>	Mitigation Measure AQ-1A: <i>Reduce Criteria Exhaust Emissions from Construction Equipment.</i>	The mitigation will apply to all construction areas.	Adequacy of the proposed practices will be confirmed with Reclamation construction managers and CSLC monitors as detailed in the Monitoring and Reporting Schedule submitted to the SJVAPCD. The SJVAPCD would prepare a Monitoring and Reporting Schedule Compliance letter upon completion.	Effectiveness will be based on the emissions calculated based on actual equipment used and operating hours with a minimum performance criteria equal to the average fleet mix as set forth in the ARB's latest Off-road Construction Emission Database. This will be detailed in the Air Impact Assessment and Monitoring and Reporting Schedule submitted to the SJVAPCD in conjunction with ISR Rule 9510.	Reclamation and CSLC.	Mitigation will be ongoing over the construction timeframe.
	Mitigation Measure AQ-1B: <i>Reduce Criteria Exhaust Emissions from Material Hauling Vehicles.</i>	The mitigation will apply to all construction areas.	Adequacy of the proposed practices will be confirmed with Reclamation construction managers and CSLC monitors as detailed in the Monitoring and Reporting Schedule submitted to the	Effectiveness will be based on the emissions calculated based on actual equipment used and operating hours with a minimum performance criteria equal to the average fleet mix as set forth in the ARB's latest EMFAC emission	Reclamation.	Mitigation will be ongoing over the construction timeframe.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
			SJVAPCD. The SJVAPCD would prepare a Monitoring and Reporting Schedule Compliance letter upon completion.	database. This will be detailed in the Air Impact Assessment and Monitoring and Reporting Schedule submitted to the SJVAPCD in conjunction with ISR Rule 9510.		
	Mitigation Measure AQ-1C: <i>Offset Project Construction Emissions through a SJVAPCD Voluntary Emission Reduction Agreement.</i>	The mitigation will apply to all construction areas.	Adequacy of the proposed practices will be confirmed with the SJVAPCD as detailed in the Monitoring and Reporting Schedule submitted to the SJVAPCD. The SJVAPCD would prepare a Monitoring and Reporting Schedule Compliance letter upon completion.	Effectiveness will be based on actual equipment used and operating hours for any emissions that are not reduced by on-site mitigation. This will be detailed in the Air Impact Assessment and Monitoring and Reporting Schedule submitted to the SJVAPCD in conjunction with ISR Rule 9510.	Reclamation.	Mitigation will be ongoing over the construction timeframe.
Impact AQ-2: <i>Conflict with Applicable Plans or Policies Related to Air Quality.</i>	Mitigation Measure AQ-2: <i>Reduce or Offset Project Emissions.</i>	The mitigation will apply to all construction areas.	Adequacy of the proposed practices will be confirmed with the SJVAPCD or Reclamation construction managers and CSLC monitors, as detailed in the Monitoring and Reporting Schedule submitted to the	Effectiveness will be based on actual equipment used and operating hours for any emissions that are not reduced by on-site mitigation. This will be detailed in the Air Impact Assessment and Monitoring and Reporting Schedule	Reclamation.	Mitigation will be ongoing over the construction timeframe.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
			SJVAPCD. The SJVAPCD would prepare a Monitoring and Reporting Schedule Compliance letter upon completion.	submitted to the SJVAPCD in conjunction with ISR Rule 9510.		
Impact AQ-3: <i>Expose Sensitive Receptors to Substantial Air Pollutants Associated with Construction.</i>	Mitigation Measure AQ-3A: <i>Reduce Diesel Particulate Matter Emissions from Construction Equipment.</i>	The mitigation will apply to all construction areas.	Adequacy of the proposed practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on use of ARB certified after-market control devices or EPA certified engines.	Reclamation.	Mitigation will be ongoing over the construction timeframe.
	Mitigation Measure AQ-3B: <i>Reduce Diesel Particulate Matter Emissions from Material Hauling Vehicles.</i>	The mitigation will apply to all construction areas.	Adequacy of the proposed practices will be confirmed with Reclamation construction managers and CSLC monitors as detailed in the Monitoring and Reporting Schedule submitted to the SJVAPCD. The SJVAPCD would prepare a Monitoring and Reporting Schedule Compliance letter upon completion.	Effectiveness will be based on the emissions calculated based on actual equipment used and operating hours with a minimum performance criteria equal to the average fleet mix as set forth in the ARB's latest EMFAC emission database. This will be detailed in the Air Impact Assessment and Monitoring and Reporting Schedule submitted to the SJVAPCD in conjunction with ISR Rule 9510.	Reclamation.	Mitigation will be ongoing over the construction timeframe.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Cultural Resources						
Impact CUL-1: <i>Effects on Archaeological Resources from Ground Disturbing Activities during Construction.</i>	Mitigation Measure CUL-1A: <i>Comply with Section 106 of the NHPA or Equivalent.</i>	In Project areas with subsequent site-specific studies and where additional access is granted.	Reclamation would report to SHPO and the consulting parties.	Successful compliance with Section 106 of the NHPA or Public Resources Code sections 5024 and 5024.5, as applicable.	Reclamation.	Site-specific environmental reviews will be conducted prior to ground-disturbing activities. Coordination will continue with the relevant Native American tribes in the area, as necessary to complete compliance processes.
	Mitigation Measure CUL-1B: <i>Conduct Subsurface Testing and/or Archaeological Monitoring in Proximity to Identified Sites or Areas of Sensitivity.</i>	Construction areas with ground-disturbing activities occurring in native sediments/soils near known archaeological resources, as well as any areas of proposed disturbance in areas determined to be highly or very highly sensitive for buried archaeological resources by Byrd et al. (2009) or a subsequent Project-specific geoarchaeological sensitivity analysis.	Geoarchaeological testing will occur prior to, and/or archaeological monitoring will occur during, specified ground-disturbing activities. Reclamation will report to SHPO and the consulting parties.	Performance tracking of this mitigation measure is based upon successful implementation and the approval of the documentation by SHPO and appropriate consulting parties.	Reclamation.	Geoarchaeological testing will occur prior to ground disturbing activities. Active archaeological monitoring, as necessary, will occur throughout the duration of these specific ground-disturbing activities.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	Mitigation Measure CUL-1C: <i>Halt Work in the Event of an Archaeological Discovery.</i>	Active construction areas during ground-disturbing activities.	Reclamation and/or CSLC will report to SHPO and the consulting parties.	Performance tracking of this mitigation measure will be based on successful implementation and approval of documentation by SHPO and appropriate consulting parties.	Reclamation and CSLC.	Mitigation will be ongoing over the construction timeframe.
	Mitigation Measure CUL-1D: <i>Plan an Intentional Site Burial Preservation in Place.</i>	Active construction areas in the event of an archaeological discovery where avoidance is not feasible and capping can be designed to effectively minimize Project effects to the discovery.	Reclamation and/or CSLC will make provisions with the archaeologist to monitor the site after the burial process is complete. Reclamation and/or CSLC will report to SHPO and the consulting parties.	Performance tracking of this mitigation measure will be based on successful implementation and the approval of the documentation by SHPO and appropriate consulting parties.	Reclamation and CSLC.	Mitigation will occur in the event of an archaeological discovery where avoidance is not feasible and would be ongoing over the construction timeframe.
	Mitigation Measure CUL-1E: <i>Avoid Soil Borrowing in the Vicinity of Known Archaeological Resources.</i>	Within the vicinity of known archaeological resources, including CA-FRA-45 and CA-FRA-106.	Reclamation and/or CSLC will report to SHPO and the consulting parties.	Avoidance of areas within delineated site boundaries.	Reclamation and CSLC.	At least 90-days prior to proposed borrowing activities.
Impact CUL-2: <i>Effects on Historic Properties Listed or Eligible for Listing in the National or California Register.</i>	Mitigation Measure CUL-2: <i>Follow the Secretary of the Interior's Standards for the Treatment of Historic Properties.</i>	Construction activities at Mendota Dam.	Reclamation and/or CSLC will report to SHPO and the consulting parties.	Secretary of the Interior's Standards are met.	Reclamation and CSLC.	Prior to and during construction activities at Mendota Dam.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Hydrology – Groundwater						
Impact GRW-1: <i>Temporary Construction-Related Effects on Groundwater Quality.</i>	Mitigation Measure GRW-1A: <i>Prepare and Implement a Stormwater Pollution Prevention Plan.</i>	Project areas with active construction or used by construction personnel, including access roads, staging and storage areas, borrow sites, within the river channel and on adjacent uplands.	At a minimum, annual reports will be submitted to the State Water Resources Control Board via the Storm Water Multiple Application and Report Tracking System.	Performance tracking will be based on successful compliance with the Statewide NPDES Construction General Permit.	Reclamation and the construction contractor.	The SWPPP will be developed prior to construction and will be implemented during construction.
	Mitigation Measure GRW-1B: <i>Prepare and Implement a Construction Groundwater Management Plan.</i>	Project areas with active dewatering.	At a minimum, annual reports will be submitted to Reclamation managers summarizing the monitoring data obtained during the previous year(s).	Performance tracking of this mitigation measure will be based upon successful compliance with the Statewide NPDES Construction General Permit and/or General Permit for Low Threat Discharges.	Reclamation and the construction contractor.	The Construction Groundwater Management Plan will be developed prior to construction and will be implemented during construction.
Hydrology – Surface Water Resources and Water Quality						
Impact SWQ-1: <i>Construction-Related Effects on Water Quality.</i>	Mitigation Measure SWQ-1: <i>Development and Implementation of SWPPP.</i>	Project areas with active construction or used by construction personnel, including access roads, staging and storage areas, borrow sites, and areas within the river channel and on adjacent uplands.	At a minimum, annual reports will be submitted to the SWRCB via the Storm Water Multiple Application and Report Tracking System.	Performance tracking will be based on successful compliance with the Statewide NPDES Construction General Permit.	Reclamation and the construction contractor.	The SWPPP will be developed prior to construction and will be implemented during construction.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Impact SWQ-3: <i>Long-Term Effects on Water Quality from Floodplain Inundation of Prior Agricultural Soils.</i>	Mitigation Measure SWQ-3: <i>Minimize Use of Pesticide and Herbicide Contaminated Soil.</i>	Floodplain areas or areas used for borrow materials.	Adequacy of the proposed construction practices will be confirmed with Reclamation managers and CSLC monitors.	Effectiveness will be based on compliance with testing and risk assessment guidelines.	Reclamation and the construction contractor.	Prior to construction of Project levees or floodplain grading.
Land Use Planning and Agricultural Resources						
Impact LU-1: <i>Removal of Land from Agricultural Production.</i>	Mitigation Measure LU-1: <i>Preserve Agricultural Productivity of Designated Farmland to the Extent Possible.</i>	Agricultural lands within the Project area.	Adequacy of the proposed activities will be confirmed with Reclamation project managers and CSLC monitors.	Effectiveness will be based on annual reporting of the number of acres removed from agricultural production during implementation.	Reclamation and CSLC.	Mitigation will be ongoing over the construction timeframe.
Impact LU-2: <i>Conversion of Designated Farmland to Non-Agricultural Uses.</i>	Mitigation Measure LU-2: <i>Preserve Agricultural Productivity of Designated Farmland to the Extent Possible.</i>	Agricultural lands within the Project area.	Adequacy of the proposed activities will be confirmed with Reclamation project managers and CSLC monitors.	Effectiveness will be based on annual reporting of the number of acres removed from agricultural production during implementation.	Reclamation and CSLC.	Mitigation will be ongoing over the construction timeframe.
Impact LU-3: <i>Conflict with Williamson Act Contracts.</i>	Mitigation Measure LU-3: <i>Preserve Agricultural Productivity of Designated Farmland to the Extent Possible.</i>	Agricultural lands within the Project area.	Adequacy of the proposed activities will be confirmed with Reclamation project managers and CSLC monitors.	Effectiveness will be based on annual reporting of the number of acres removed from agricultural production during implementation.	Reclamation and CSLC.	Mitigation will be ongoing over the construction timeframe.
Impact LU-5: <i>Conflict with Applicable Land</i>	Mitigation Measure LU-5: <i>Notify County Planning Agencies</i>	Agricultural lands within the Project area.	Notifications of zoning and land use plan inconsistencies will be	Effectiveness will be based on whether updates can be made by	Reclamation and CSLC.	Formal notification of any zoning and/or land use plan

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
<i>Use Plans Regarding Agricultural Lands.</i>	<i>of General Plan and Zoning Ordinance Inconsistencies.</i>		confirmed with Reclamation project managers and CSLC monitors.	county planning agencies.		inconsistencies would occur after project approval.
Noise and Vibration						
Impact NOI-1: <i>Exposure of Sensitive Receptors to Temporary Construction Noise.</i>	Mitigation Measure NOI-1: <i>Reduce Temporary and Short-Term Noise Levels from Construction-Related Equipment Near Sensitive Receptors.</i>	Project areas where construction activities will be conducted within 2,000 feet of noise-sensitive receptors.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on public complaints to the SJRRP.	Reclamation and the construction contractor.	Ongoing when construction activities occur outside of construction noise exempt hours.
Impact NOI-2: <i>Exposure of Sensitive Receptors to Temporary Construction Vibration.</i>	Mitigation Measure NOI-2: <i>Minimize Vibration Related Effects.</i>	Project areas where pile driving construction activities will be conducted within 300 feet or less of sensitive receptors.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on public complaints to the SJRRP.	Reclamation and the construction contractor.	Ongoing during pile driving construction activities within 300 feet or less of residential structures.
Impact NOI-3: <i>Increased Off-Site Vehicular Traffic Noise due to Construction Related Trips.</i>	Mitigation Measure NOI-3: <i>Reduce Temporary Noise Levels from Construction-Related Traffic Increases Near Sensitive Receptors.</i>	Haul routes near sensitive receptors along San Mateo Avenue.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on public complaints to the SJRRP.	Reclamation and the construction contractor.	Ongoing when construction activities occur outside of construction noise exempt hours.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Paleontological Resources						
Impact PAL-1: <i>Possible Damage to or Destruction of Unique Paleontological Resources.</i>	Mitigation Measure PAL-1: <i>Stop Work if Paleontological Resources Are Encountered During Earthmoving Activities and Implement Recovery Plan.</i>	Construction areas with active excavation.	Preparation of a recovery plan in accordance with SVP Guidelines, if paleontological resources are discovered during earthmoving activities and notification of CSLC monitors if find is on land under the CSLC's jurisdiction.	Performance tracking of this mitigation measure will be based on the stoppage in work in the vicinity of the find and meeting the recommendations in the recovery plan.	Reclamation.	Mitigation would be ongoing over the construction timeframe.
Public Health and Hazardous Materials						
Impact HAZ-2: <i>Increased Exposure to Hazardous Materials for People Residing or Working in the Project Area.</i>	Mitigation Measure HAZ-2A: <i>Follow General Hazardous Materials Guidelines.</i>	Location: Project areas with active construction or used by construction personnel including access roads, staging and storage areas, and borrow sites.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on incidence of hazardous material spills.	Reclamation and CSLC.	Ongoing over the construction timeframe.
	Mitigation Measure HAZ-2B: <i>Properly Dispose of Hazardous Building Components.</i>	Construction areas with potential hazardous building components.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on compliance with health and safety guidelines.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	Mitigation Measure HAZ-2C: <i>Properly Dispose of Pesticides.</i>	Project areas with active construction or used by construction personnel with pesticide or herbicide containers.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on compliance with disposal guidelines.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.
	Mitigation Measure HAZ-2D: <i>Properly Manage Discolored or Odiferous Soils.</i>	Project areas with active construction or used by construction personnel with discolored or odiferous soils.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on compliance with regulatory guidelines.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.
	Mitigation Measure HAZ-2E: <i>Properly Remove Underground Storage Tanks.</i>	Project areas with active construction or used by construction personnel including access roads, staging and storage areas, and borrow sites with underground storage tanks.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on compliance with regulatory guidelines.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.
Impact HAZ-3: <i>Creation of a Substantial Hazard from Disturbance of Known Hazardous Material Sites.</i>	Mitigation Measure HAZ-3: <i>Minimize Disturbance to Known Hazardous Material Sites.</i>	Project areas with active construction or used by construction personnel including access roads, staging and storage areas, and borrow sites that have abandoned oil and gas wells or asbestos	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on compliance with regulatory guidelines.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
		containing material.				
Impact HAZ-4: <i>Creation of a Substantial Hazard from Mobilization of Soil Contaminants on the Floodplain.</i>	Mitigation Measure HAZ-4: <i>Minimize Use of Pesticide and Herbicide Contaminated Soil.</i>	Project areas with active construction or used by construction personnel including borrow sites.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on compliance with testing and risk assessment guidelines.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.
Impact HAZ-5: <i>Exposure of People to Increased Risk of Diseases.</i>	Mitigation Measure HAZ-5A: <i>Minimize Exposure to Potential West Nile Virus Carrying Vectors.</i>	Project areas with active construction or used by construction personnel.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on evidence of mosquitos and complaints of mosquito bites.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.
	Mitigation Measure HAZ-5B: <i>Minimize Exposure to Potential Hantavirus Vectors.</i>	Project areas with active construction or used by construction personnel, particularly in enclosed buildings.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on implementation of construction training.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.
	Mitigation Measure HAZ-5C: <i>Minimize Exposure to Valley Fever.</i>	Project areas with active construction or used by construction personnel.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on compliance with dust control measures.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Impact HAZ-6: <i>Creation of a Substantial Hazard from Decommissioned Wells.</i>	Mitigation Measure HAZ-6: <i>Minimize the Disturbance of Idle or Abandoned Wells.</i>	Project areas with active construction or used by construction personnel, including borrow sites.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on implementation of the pre-construction measures.	Reclamation, CSLC, and the construction contractor.	Ongoing over the construction timeframe.
Recreation						
Impact REC-1: <i>Construction-Related Effects on Recreation Opportunities and Facilities.</i>	Mitigation Measure REC-1: <i>Minimize Construction Effects on Recreation Uses.</i>	The location of proposed construction area security modifications will vary as construction activities move throughout the Project area but would be focused primarily at Mendota Pool.	Adequacy of the proposed construction practices will be confirmed with Reclamation managers and CSLC monitors.	Effectiveness will be based on public complaints to the SJRRP.	Reclamation and CSLC.	Mitigation will be ongoing over the construction timeframe.
Impact REC-2: <i>Permanent Displacement of Existing Recreation Uses and Access Restrictions from Project Facilities.</i>	Mitigation Measure REC-2: <i>Establish Boat Portage Facilities Around Project Facilities.</i>	The location of the new portage facilities will be at Project structures (i.e., between the fish barrier and Mendota Pool, at the Mendota Pool Dike, and at the South Canal bifurcation structure).	Adequacy of the proposed portage facilities will be confirmed with Reclamation managers and CSLC monitors.	Effectiveness will be based on public complaints to the SJRRP.	Reclamation and CSLC.	Mitigation will be completed at the time of structure installations.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Transportation and Traffic						
Impact TRA-4: <i>Potential to Result in Inadequate Emergency Access.</i>	Mitigation Measure TRA-4A: <i>Provide Temporary Roadway and Crossing at San Mateo Avenue.</i>	Active construction areas along San Mateo Avenue.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on access availability.	Reclamation and the construction contractor.	Ongoing over the construction timeframe.
	Mitigation Measure TRA-4B: <i>Use Construction Sequencing to Provide Continuous Emergency Access at Drive 10 ½.</i>	Active construction areas at Drive 10 ½.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on access availability.	Reclamation and the construction contractor.	Ongoing over the construction timeframe.
Visual Resources						
Impact VIS-1: <i>Construction Related Effects on the Visual Quality of the Project Site and Its Surroundings.</i>	Mitigation Measure VIS-1: <i>Minimize Visual Disruption from Construction Activities.</i>	The location of proposed construction area modifications will vary as construction activities move throughout the Project area but will be focused primarily at Mendota Pool Park and San Mateo Avenue. Fencing will be implemented where topography and Project area activities allow.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on public complaints to the SJRRP.	Reclamation, CSLC, and the contractor.	Mitigation will be ongoing over the construction timeframe.

**Table 26-4.
Mitigation Monitoring and Reporting Program**

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Impact VIS-6: <i>Substantial Changes in Light or Glare.</i>	Mitigation Measure VIS-6: <i>Require Conformance to Lighting Standards.</i>	The location of proposed construction area modifications will vary as construction activities move throughout the Project area but will be focused primarily at the Mendota Dam area and the Bass Avenue residential area.	Adequacy of the proposed construction practices will be confirmed with Reclamation construction managers and CSLC monitors.	Effectiveness will be based on public complaints to the SJRRP.	Reclamation, CSLC, and the contractor.	Mitigation will be ongoing over the construction timeframe.

Key:

AAQS = ambient air quality standards
 ARB = California Air Resources Board
 CSLC = California State Lands Commission
 EPA = U.S. Environmental Protection Agency
 ISR = indirect source rule
 NHPA = National Historic Preservation Act

NPDES = National Pollutant Discharge Elimination System
 Reclamation = U.S. Department of the Interior, Bureau of Reclamation
 SHPO = State Historic Preservation Officer
 SJRRP = San Joaquin River Restoration Program
 SJVAPCD = San Joaquin Valley Air Pollution Control District
 SWPPP = stormwater pollution prevention plan

1 **26.9.2 Environmental Commitments**

2 The following section summarizes the environmental commitments detailed in Section
 3 2.2.10 that would be implemented with the Action Alternatives to avoid potentially
 4 adverse environmental consequences. These commitments are consistent with those
 5 commitments provided in the PEIS/R.

6 **Conservation Strategy**

7 As part of Program implementation, a comprehensive strategy for the conservation of
 8 listed and sensitive species and habitats has been prepared, and will be implemented in
 9 coordination with U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries
 10 Service (NMFS), and California Department of Fish and Wildlife (DFW). The goals of
 11 the strategy are as follows:

- 12 • Conserve riparian vegetation and waters of the United States, including wetlands
- 13 • Control and manage invasive species
- 14 • Conserve special-status species

15 The Program’s Conservation Strategy includes conservation measures for biological
 16 resources that may be affected by Project actions (listed in Table 26-5). These measures
 17 are the same as those presented in the PEIS/R (SJRRP 2011a, pages 2-55 to 2-79) and
 18 those detailed in Table 2-8 in Section 2.2.10 of this EIS/R.

**Table 26-5.
 Conservation Measures for Biological Resources**

Identifier	Conservation Measure
VELB	Valley Elderberry Longhorn Beetle
VELB-1	<i>Avoid and Minimize Effects to Species</i>
VELB-2	<i>Compensate for Temporary or Permanent Loss of Habitat</i>
BNLL	Blunt-Nosed Leopard Lizard
BNLL-1	<i>Avoid and Minimize Effects to Species</i>
BNLL-2	<i>Compensate for Temporary or Permanent Loss of Habitat or Species</i>
PLANTS	Other Special-Status Plants
PLANTS-1	<i>Avoid and Minimize Effects to Special-Status Plants</i>
GGS	Giant Garter Snake
GGS-1	<i>Avoid and Minimize Loss of Habitat for Giant Garter Snake</i>
GGS-2	<i>Compensate for Temporary or Permanent Loss of Habitat</i>
WPT	Western Pond Turtle
WPT-1	<i>Avoid and Minimize Loss of Individuals</i>
EAGLE	Bald Eagle and Golden Eagle
EAGLE-1	<i>Avoid and Minimize Effects to Bald and Golden Eagles (as Defined in the Bald and Golden Eagle Protection Act)</i>
SWH	Swainson’s Hawk
SWH-1	<i>Avoid and Minimize Impacts to Swainson’s Hawk</i>
SWH-2	<i>Compensate for Loss of Nest Trees and Foraging Habitat</i>

**Table 26-5.
Conservation Measures for Biological Resources**

Identifier	Conservation Measure
RAPTOR	Other Nesting Raptors
<i>RAPTOR-1</i>	<i>Avoid and Minimize Loss of Individual Raptors</i>
<i>RAPTOR-2</i>	<i>Compensate for Loss of Nest Trees</i>
RNB	Riparian Nesting Birds: Least Bell's Vireo
<i>RNB-1</i>	<i>Avoid Effects to Species</i>
<i>RNB-2</i>	<i>Avoid, Minimize, and Compensate for Effects to Species</i>
MTBA	Other Birds Protected by the Migratory Bird Treaty Act
<i>MTBA-1</i>	<i>Avoid and Minimize Effects to Species</i>
BRO	Burrowing Owl
<i>BRO-1</i>	<i>Avoid Loss of Species</i>
<i>BRO-2</i>	<i>Minimize Impacts to Species</i>
BAT	Special-Status Bats
<i>BAT-1</i>	<i>Avoid and Minimize Loss of Species</i>
<i>BAT-2</i>	<i>Compensate for Loss of Habitat</i>
FKR	Fresno Kangaroo Rat
<i>FKR-1</i>	<i>Avoid and Minimize Effects to Species</i>
<i>FKR-3</i>	<i>Compensate for Temporary or Permanent Loss of Habitat or Species</i>
SJKF	San Joaquin Kit Fox
<i>SJKF-1</i>	<i>Avoid and Minimize Effects to Species</i>
PL	Pacific Lamprey
<i>PL-1</i>	<i>Avoid and Minimize Effects to Species</i>
RHSNC	Riparian Habitat and Other Sensitive Natural Communities
<i>RHSNC-1</i>	<i>Avoid and Minimize Loss of Riparian Habitat and Other Sensitive Natural Communities</i>
<i>RHSNC-2</i>	<i>Compensate for Loss of Riparian Habitat and Other Sensitive Natural Communities</i>
WUS	Waters of the United States/Waters of the State
<i>WUS-1</i>	<i>Identify and Quantify Wetlands and Other Waters of the United States</i>
<i>WUS-2</i>	<i>Obtain Permits and Compensate for Any Loss of Wetlands and Other Waters of the United States/Waters of the State</i>
INV	Invasive Plants
<i>INV-1</i>	<i>Implement the Invasive Vegetation Monitoring and Management Plan</i>
CP	Conservation Plans
<i>CP-1</i>	<i>Remain Consistent with Approved Conservation Plans</i>
<i>CP-2</i>	<i>Compensate Effects Consistent with Approved Conservation Plans</i>
GS	Southern Distinct Population Segment of North American Green Sturgeon
<i>GS-1</i>	<i>Avoid and Minimize Loss of Habitat and Individuals</i>
CVS	Central Valley Steelhead
<i>CVS-1</i>	<i>Avoid Loss of Habitat and Risk of Take of Species</i>
<i>CVS-2</i>	<i>Minimize Loss of Habitat and Risk of Take of Species</i>
SRCS	Central Valley Spring-Run Chinook Salmon
<i>SRCS-1</i>	<i>Avoid and Minimize Loss of Habitat and Individuals</i>
EFH	Essential Fish Habitat (Pacific Salmonids)
<i>EFH-1</i>	<i>Avoid Loss of Habitat and Risk of Take of Species</i>
<i>EFH-2</i>	<i>Minimize Loss of Habitat and Risk of Take from Implementation of Construction Activities</i>

1 **Minimize Flood Risk from Interim and Restoration Flows**

2 The Program’s strategy for minimizing flood risk is to limit the maximum downstream
3 extent and rate of Interim and Restoration flows for the given reach to then-existing
4 channel capacities. This strategy is incorporated by reference from the PEIS/R (SJRRP
5 2011a, pages 2-22 through 2-28) and summarized in Section 2.2.10 of this EIS/R. These
6 Program-wide commitments are documented in the PEIS/R Record of Decision (ROD),
7 and no new Project-level actions to minimize flood risk from Interim and Restoration
8 flows are being proposed.

9 **Other Environmental Commitments**

10 The other environmental commitments that will be implemented by the Project
11 proponents to avoid potentially adverse environmental consequences are detailed in
12 Section 2.2.10 and summarized here. Many of these measures are consistent with those
13 specified in the PEIS/R ROD.

14 Air Quality

- 15 • The Project proponents will comply with San Joaquin Valley Air Pollution
16 Control District (SJVAPCD) Regulation VIII.
- 17 • The Project proponents will comply with SJVAPCD Rule 9510, “Indirect Source
18 Review.”

19 Geology and Soils

- 20 • Site-specific geotechnical exploration, testing, and analysis will be conducted
21 prior to final design.
- 22 • The Project proponents will prepare and implement a stormwater pollution
23 prevention plan that complies with applicable Federal regulations concerning
24 construction activities. (This measure is the same as GRW-1A and SQW-1.)
- 25 • Excavation of borrow materials will be done in accordance with Reclamation
26 design standards, and comply with provisions of the Clean Water Act Section 402
27 and the National Pollutant Discharge Elimination System Construction General
28 Permit.

29 Public Health and Hazardous Materials

- 30 • The Project proponents will comply with the California Environmental Protection
31 Agency’s (Cal/EPA’s) Unified Program.
- 32 • The Project proponents will comply with Federal, State, and local hazardous
33 materials regulations, as applicable, monitored by the State (e.g., California
34 Occupational Safety and Health Administration [Cal/OSHA], Department of
35 Toxic Substances Control, California Highway Patrol) and/or local jurisdictions.
- 36 • The Project proponents will adopt reasonable wildland fire safety strategies and
37 have the firefighting equipment required by Cal/OSHA during all phases of
38 construction.

1 Transportation and Traffic

- 2 • The Project proponents will comply with Department of Motor Vehicles codes by
3 requiring contractors and employees to be properly licensed and endorsed when
4 operating commercial vehicles.
- 5 • The Project proponents will comply with California Vehicle Code section 35551
6 by enforcing compliance with weight restrictions on vehicles traveling on
7 freeways and highways and by requiring heavy haulers to obtain permits, if
8 required, prior to delivery of any heavy haul load.
- 9 • The Project proponents will comply with California Vehicle Code section 35780
10 by requiring heavy haulers to obtain a Single-Trip Transportation Permit prior to
11 delivery of any oversized load.
- 12 • The Project proponents will acquire the necessary permits and approval from the
13 California Department of Transportation (Caltrans) for relocation of any
14 structures or fixtures necessary to telegraph, telephone, or electric power lines or
15 of any ditches, pipes, drains, sewers, or underground structures located in the
16 public rights-of-way.
- 17 • As required by the PEIS/R ROD, the Project proponents will prepare and
18 implement a traffic management plan that identifies the number of truck trips,
19 time of day for arrival and departure of trucks, limits on number of truck trips,
20 and traffic circulation control measures. During project construction, access to
21 existing land uses will be maintained at all times, with detours used as necessary
22 during road closures. The traffic management plan will be submitted to the
23 appropriate county public works, fire, police, and sheriff departments for
24 comments.

25 Utilities and Service Systems

- 26 • As required by the PEIS/R ROD, to minimize and avoid disruption of subsurface
27 utilities from ground disturbing activities, Project proponents will (1) confirm the
28 location of existing underground utilities, (2) coordinate with the owners of
29 transmission lines and pipelines, (3) design restoration actions to avoid affecting
30 underground facilities, if feasible, and (4) coordinate with the utility owner to shut
31 off and relocate the utilities, as necessary.
- 32 • The location of public utilities will be confirmed and appropriate notifications
33 will be made by contacting utility providers (e.g., power and communication
34 utility service, and irrigation district service) who operate, maintain or own
35 utilities in the Project area.
- 36 • Construction contractors will request an underground service alert from
37 Underground Service Alert North in advance of earthmoving activities to locate
38 and avoid underground utilities.
- 39 • Solid waste removed from the Project area will be disposed of in a permitted
40 landfill. The operator of the recycling/disposal location will be notified and

1 Project proponents will obtain approval for the type and amount of solid waste
2 that will be generated.

3 ***Permitting***

4 Reclamation will obtain all necessary permits, as required by law. The permits and
5 approvals that may be required for implementation of the Project are described in Section
6 2.2.10, Table 2-10. In general, Federal and State actions (permit issuance) will require a
7 signed ROD (NEPA) and findings, EIR certification, and Notice of Determination (NOD)
8 documents (CEQA). Additional information on permit acquisition procedures, submittal
9 package requirements, critical issues, timing, and permit fees is discussed in the Project's
10 Regulatory Compliance TM (SJRRP 2011b).

11

This page left blank intentionally.

27.0 Consultation, Coordination, and Compliance

This chapter summarizes the activities undertaken by U.S. Department of the Interior, Bureau of Reclamation (Reclamation), California State Lands Commission (CSLC), and California Department of Water Resources (DWR) to satisfy National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), and other regulatory requirements, as well as activities undertaken for public and agency involvement. In addition, this chapter lists the needed permits, petitions, compliance documents, etc. for the Project-level actions. For a complete list of Project-level actions, see Chapter 2.0, “Description of Alternatives.” This chapter also describes the public scoping process used to involve the public and agencies in the development of the Draft Environmental Impact Statement/Report (EIS/R). Section 27.4, “Distribution List,” lists the entities receiving a copy of this EIS/R.

Reclamation and DWR jointly conducted initial public outreach and agency involvement efforts related to development of this EIS/R. Reclamation and CSLC continued these public outreach and agency involvement efforts throughout development of this EIS/R. These consultations assisted Reclamation, CSLC, and DWR in determining the scope of the EIS/R, developing Project components, identifying the range of alternatives, defining potential environmental impacts and the significance of those impacts, and identifying appropriate mitigation measures. These efforts consist of public scoping meetings and ongoing meetings with stakeholders to obtain their input and comments. Reclamation and CSLC will continue to solicit public and agency input by encouraging review of this EIS/R. Past and future public involvement, consultation, and coordination efforts are discussed in Section 27.3.

27.1 Compliance with Related Laws, Rules, Regulations, and Executive Orders

Federal and State laws, rules and regulations, Executive Orders (EOs), and compliance requirements for implementation of the Project alternatives are described in the following sections. Descriptions are organized by Federal, State, and local requirements.

27.1.1 Federal Requirements

Compliance with Federal laws, rules and regulations for implementation of the Project alternatives are summarized below. A total of 27 Federal requirements are identified.

San Joaquin River Restoration Settlement Act

The San Joaquin River Restoration Settlement Act authorizes and directs the Secretary of Interior to implement the Settlement. Sections of the San Joaquin River Restoration Settlement Act, and the relationship between the San Joaquin River Restoration

1 Settlement Act and Program implementation, are described in Section 28.1 of the
2 Program Environmental Impact Statement/Report (PEIS/R) (San Joaquin River
3 Restoration Program [SJRRP] 2011a, pages 28-1 to 28-9).

4 ***National Environmental Policy Act***

5 NEPA is the Nation’s broadest environmental law, applying to all Federal agencies and
6 most of the activities they manage, regulate, or fund that affect the environment. It
7 requires Federal agencies to disclose and consider the environmental implications of their
8 proposed actions. NEPA establishes environmental policies for the Nation, provides an
9 interdisciplinary framework for Federal agencies to avoid or minimize environmental
10 effects, and contains action-forcing procedures to ensure that decision makers at Federal
11 agencies take environmental factors into account.

12 Council on Environmental Quality (CEQ) has adopted regulations and other guidance
13 providing detailed procedures that Federal agencies follow to implement NEPA. The U.S.
14 Department of the Interior has also developed regulations for the implementation of
15 NEPA (43 Code of Federal Regulations [CFR] Part 46). Reclamation will use this EIS/R
16 to comply with NEPA and CEQ and U.S. Department of the Interior regulations to
17 implement specific actions. Project-level actions are analyzed in this EIS/R, and once this
18 EIS/R is finalized and combined with the Record of Decision, it will comprise the
19 complete NEPA compliance for these project-level actions.

20 ***Clean Water Act, Section 401***

21 Under Clean Water Act (CWA) Section 401, applicants for a Federal license or permit to
22 conduct activities that may result in the discharge of a pollutant into waters of the United
23 States must obtain certification for the discharge. The certification must be obtained from
24 the state in which the discharge would originate or, if appropriate, from the interstate
25 water pollution control agency with jurisdiction over the affected waters at the point
26 where the discharge would originate. Therefore, all projects that have a Federal
27 component and may affect state water quality (including projects that require Federal
28 agency approval, such as issuance of a Section 404 permit) must also comply with CWA
29 Section 401.

30 In California, the authority to grant water quality certification has been delegated to the
31 State Water Resources Control Board (SWRCB), and applications for water quality
32 certification under CWA Section 401 are typically processed by the Regional Water
33 Quality Control Board (RWQCB) with local jurisdiction — in this case, the Central
34 Valley RWQCB. Water quality certification requires evaluation of potential impacts in
35 light of water quality standards and CWA Section 404 criteria governing discharge of
36 dredged and fill materials into waters of the United States. Coordination with the Central
37 Valley RWQCB relative to compliance with CWA Section 401 is discussed below, under
38 Section 27.1.2, “State Requirements.”

39 The proposed action would result in fill and/or dredging of jurisdictional waters of the
40 State, including wetlands, particularly in the San Joaquin River and nearby channels such
41 as the Fresno Slough and Little San Joaquin Slough. As a result, a Section 401 Water
42 Quality Certification would be required for these actions.

1 Prior to initiating any project-level actions that could result in discharge of pollutants into
 2 jurisdictional features, Reclamation will apply for a Section 401 water quality
 3 certification from the Central Valley RWQCB.

4 **Clean Water Act, Section 402**

5 Dischargers whose projects disturb 1 or more acres of soil or whose projects disturb less
 6 than 1 acre but are part of a larger common plan of development that in total disturbs 1 or
 7 more acres, are required to obtain coverage under the General Permit for Stormwater
 8 Discharges Associated with Construction and Land Disturbance Activity (Construction
 9 General Permit, 2009-0009-DWQ). Construction activity subject to this permit includes
 10 clearing, grading, and disturbances to the ground such as stockpiling or excavation, but
 11 does not include regular maintenance activities performed to restore the original line,
 12 grade, or capacity of the facility. In California, the authority to regulate compliance with
 13 CWA Section 402 requirements is shared between the SWRCB and the nine RWQCBs.
 14 Most enforcement responsibilities are delegated to the RWQCBs; therefore, the lead
 15 agency will coordinate with the Central Valley RWQCB to ensure compliance.

16 To acquire a Construction General Permit, applicants must submit Permit Registration
 17 Documents, including a Notice of Intent Form to discharge stormwater, a Stormwater
 18 Pollution Prevention Plan (SWPPP), and other documents. The Stormwater Pollution
 19 Prevention Plan must be prepared by a Qualified SWPPP Developer and must list best
 20 management practices (BMPs) the discharger will use to protect stormwater
 21 runoff. Implementation of these BMPs must be overseen by a Qualified SWPPP
 22 Practitioner.

23 Compliance with the General Permit also requires on-site visual monitoring of
 24 stormwater and non-stormwater discharges and the submission of annual reports
 25 throughout the duration of the Project. Depending on the risk level of the Project,
 26 additional monitoring may be required. Once the Project is complete, the applicant must
 27 submit a Notice of Termination to be approved by the RWQCB.

28 The proposed action would result in discharges of waste into waters of the State, which
 29 include “any surface water or ground water, including saline waters, within the
 30 boundaries of the State.” A National Pollutant Discharge Elimination System (NPDES)
 31 permit will be required for construction-related discharges to surface waters.

32 **Clean Water Act, Section 404**

33 Section 404 of the CWA requires that a permit be obtained from the U.S. Army Corps of
 34 Engineers (Corps) for the discharge of dredged or fill material into “waters of the United
 35 States, including wetlands.” Waters of the United States include traditionally navigable
 36 rivers and their tributaries and adjacent wetlands that have a significant nexus to waters
 37 of the United States. Waters of the United States are defined for regulatory purposes, at
 38 33 CFR 328.3 (a), as follows:

39 *(1) All waters which are currently used, or were used in the past, or*
 40 *may be susceptible to use in interstate or foreign commerce, including*
 41 *all waters which are subject to the ebb and flow of tide;*

- 1 (2) *All interstate waters, including interstate wetlands;*
- 2 (3) *All other waters such as intrastate lakes, rivers, streams,*
3 *(including intermittent streams), mudflats, sandflats, wetlands,*
4 *sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds,*
5 *the use, degradation or destruction of which could affect interstate or*
6 *foreign commerce...*
- 7 (4) *All impoundments of waters otherwise defined as waters of the*
8 *United States under the definition;*
- 9 (5) *Tributaries of waters identified in paragraphs (a)(1) through (4) of*
10 *this section;*
- 11 (6) *The territorial seas; and*
- 12 (7) *Wetlands adjacent to waters (other than waters that are themselves*
13 *wetlands) identified in paragraphs (a) (1) through (6) of this section.*

14 CWA Section 404(b) requires that the Corps process permits in compliance with
15 guidelines developed by the U.S. Environmental Protection Agency (EPA). These
16 guidelines, the CWA Section 404(b)(1) Guidelines, require analysis of alternatives
17 available to meet a project’s purpose and need, including those alternatives that avoid and
18 minimize discharges of dredged or fill materials in waters. Once alternatives deemed to
19 be practicable have been identified, the Corps must permit the least environmentally
20 damaging practicable alternative.

21 Actions typically subject to Section 404 requirements are those that would take place in
22 wetlands or stream channels, including intermittent streams, even if they have been
23 realigned or otherwise altered in the past. Activities that require a permit under
24 Section 404 include, but are not limited to, placing fill or riprap, grading, mechanized
25 land clearing, and dredging in waters of the United States. Within stream channels, a
26 permit under Section 404 would be needed for any discharge activity below the ordinary
27 high water mark. The term "ordinary high water mark" refers to “that line on the shore
28 established by the fluctuations of water and indicated by physical characteristics such as
29 clear, natural line impressed on the bank, shelving, changes in the character of soil,
30 destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate
31 means that consider the characteristics of the surrounding areas” (33 CFR 328.3(e)). The
32 *Field Guide to the Identification of the Ordinary High Water Mark in the Arid West*
33 *Region of the Western United States* is used to determine the Ordinary High Water Mark
34 (Corps 2008).

35 The Corps Regulatory Branch issues several types of Section 404 permits. Those most
36 applicable to the proposed action are Nationwide Permits and Individual Permits. Projects
37 with only minimal adverse effects (i.e., fills of less than 0.5 acre of nontidal waters of the
38 United States) can typically be authorized under the Corps’ Nationwide Permits program
39 to expedite the environmental compliance process, provided the Project satisfies the

1 terms and conditions of the particular Nationwide Permits. Since the Project would have
2 more than minimal impacts, it would require an Individual Permit.

3 The CWA and guidelines outlined in a Memorandum of Agreement (MOA) between the
4 EPA and the Corps dated November 15, 1989, set forth a goal of restoring and
5 maintaining existing aquatic resources. This MOA directs the Corps to strive to avoid
6 adverse impacts and offset unavoidable adverse impacts to existing aquatic resources, and
7 for wetlands, to strive to achieve a goal of no overall net loss of values and functions. The
8 MOA also noted the value of other waters of the United States, including streams, rivers,
9 and lakes. Under the guidelines, all jurisdictional waters of the United States are afforded
10 protection and requirements are outlined for practicable mitigation based on values and
11 functions of the aquatic resources that will be affected.

12 EPA develops regulations with which the Corps must comply and reviews the permits
13 issued by the Corps. Section 404(c) of the CWA authorizes EPA to veto a Corps decision
14 to issue a permit if a proposed action “will have an unacceptable effect on municipal
15 water supplies, shellfish beds and fishery areas, wildlife, or recreational areas.”

16 The proposed action would result in fill and/or dredge of jurisdictional waters of the
17 United States, including wetlands, especially within the San Joaquin River during any in-
18 river construction activities (e.g., levee removal and construction of the San Mateo
19 Avenue crossing) and at other locations, including Fresno Slough and Little San Joaquin
20 Slough. As a result, this Project will require authorization from the Corps pursuant to
21 Section 404 of the CWA.

22 Reclamation and DWR consulted early in the planning process with the Corps regarding
23 Section 404 CWA compliance. Reclamation and CSLC have continued the consultation
24 process. Before initiating any project-level actions that could result in discharge into
25 jurisdictional features, the Project proponents will apply for a CWA permit from the
26 Corps. The Corps will evaluate the proposed action to determine whether it is the least
27 environmentally damaging practicable alternative pursuant to Section 404(b)(1)
28 Guidelines.

29 This EIS/R evaluates the environmental effects on jurisdictional features resulting from
30 the discharge of dredged and fill material to support a Section 404(b)(1) analysis.
31 Additional details specific to restoration and other actions will be submitted during the
32 permitting process. The Corps will determine whether the specific proposed action would
33 be authorized under the Nationwide Permit Program or whether an individual permit
34 would be applicable. Early and ongoing coordination with the Corps, and the requirement
35 to obtain permits from the Corps before initiating any actions, demonstrates that
36 Reclamation is committed to complying with the CWA. Reclamation, DWR, and the
37 Corps have been meeting regularly to discuss Section 404 compliance issues.

38 Note that Section 404 of the CWA does not apply to authorities granted to the Corps
39 under the Rivers and Harbors Act of 1899 (RHA), except that some of the same waters
40 may be regulated under both statutes. The Corps typically combines the permit

1 requirements of Section 10 of the RHA and Section 404 of the CWA into a single
2 permitting process.

3 ***Rivers and Harbors Act of 1899, as Amended (Sections 14 and Section 10)***

4 RHA addresses activities that involve the construction of, among other structures, dams,
5 bridges, and dikes across any navigable water. The act also addresses placement of
6 obstructions to navigation outside established Federal lines, as well as the excavation or
7 deposition of material in such waters. All of these actions require permits from the Corps.
8 Navigable waters are defined in 33 CFR 329.4 as follows:

9 *Those waters that are subject to the ebb and flow of the tide and/or are*
10 *presently used, or have been used in the past, or may be susceptible*
11 *for use to transport interstate or foreign commerce. A determination of*
12 *navigability, once made, applies laterally over the entire surface of the*
13 *waterbody, and is not extinguished by later actions or events which*
14 *impede or destroy navigable capacity.*

15 Sections of the RHA applicable to the Project alternatives are described below.

16 **Section 14.** Under RHA Section 14 (33 United States Code [USC] 408), referred to as
17 “Section 408,” the Secretary of the Army, on the recommendation of the Chief of
18 Engineers, may grant permission for alteration of the Federal levee system if the
19 alteration would not be injurious to the public. These actions could include degradations,
20 raisings, realignments or other alteration or modifications to the Federal levee system
21 which would cause significant changes to the authorized flood control project’s scope.

22 Major alterations to a Federal flood control project, including alterations to channels and
23 levees that change the Federal project’s authorized geometry or the hydraulic capacity,
24 would require a Section 408 permit. Section 408 requires authorization from the Corps
25 for the alteration of any sea wall, bulkhead, jetty, dike, levee, wharf, pier, or other work
26 built by a Federal agency for the preservation and improvement of any of its navigable
27 waters or to prevent floods. The types of alterations or modifications that require Section
28 408 approval include degradations, raisings, and realignments to the flood protection
29 system or any modification where engineering analysis indicates that the system
30 performance is adversely impacted. To receive authorization, the applicant must establish
31 that the proposed alteration will not be injurious to the public interest and will not impair
32 the usefulness of such work.

33 Section 208.10 (33 CFR 208.10) provides regulations regarding encroachments on
34 Federal flood control structures and facilities that are constructed for local flood
35 protection. Minor, low impact modifications of Federal flood control projects which do
36 not adversely affect the function of the protective system can be approved by the Corps
37 under Section 208.10. These modifications cannot change the authorized geometry or the
38 hydraulic capacity of the Federal project. Small alterations are typically approved under a
39 Central Valley Flood Protection Board (CVFPB) Encroachment Permit and are reviewed
40 and approved by the Corps in accordance with Section 208.10. The Corps would initiate

1 formal actions under Section 408 and Section 208.10 at the request of the CVFPB. The
2 Corps is also consulted prior to initiating formal actions.

3 If the Project alters a Federal flood control project by relocating or modifying an existing
4 Federal project levee, the Corps approval under Section 14 of the RHA (33 USC 408,
5 referred to as Section 408) or under Section 208.10 (33 CFR 208.10) is required prior to
6 proceeding with the Project.

7 **Section 10.** Under RHA Section 10 (33 USC 403), the Corps regulates work in, over, or
8 under; excavation of material from; or deposition of material into navigable waters.
9 Structures or work outside the limits defined for navigable waters would require a
10 Section 10 permit if the structure or work affects the course, location, condition, or
11 capacity of the water body.

12 The jurisdiction of the Corps under CWA overlaps and extends beyond the geographic
13 scope of its jurisdiction under the RHA. The Corps permitting authority under the RHA is
14 not subject to EPA oversight or any other restrictions specific to the CWA and, in some
15 cases, the RHA alone will apply to waters. A permit from the Corps is required prior to
16 any work in, over, or under; excavation of material from, or deposition of material into,
17 navigable waters.

18 The San Joaquin River is navigable for a length of 236 miles from its mouth to a point
19 approximately 7 miles downstream from State Route (SR) 99, encompassing Reaches 1B
20 downstream through Reach 5 and the San Joaquin River from the Merced River to the
21 Delta. Restoration actions are proposed in the navigable Reaches 1B through 5 (inclusive
22 of Reach 2B).

23 A Section 10 permit would be required prior to any activity that would alter these waters.
24 Reclamation would apply for a Section 10 permit from the Corps' Sacramento District
25 prior to construction, and that application would be processed simultaneously with the
26 Section 404 CWA permit application. This EIS/R evaluates project-level environmental
27 effects on waters of the United States, including navigable waters. This evaluation would
28 be needed to support issuance of a Section 10 permit.

29 The proposed action would result in construction in, over, or under; excavation of
30 material from; or deposition of material into "navigable waters," such as the San Joaquin
31 River. As a result, the Project will require authorization from the Corps pursuant to
32 Section 10 of the RHA (33 USC 403) for the construction of certain elements of the
33 Project.

34 Reclamation and DWR consulted early in the planning process with the Corps regarding
35 the Section 10 CWA compliance. Reclamation and CSLC have continued the
36 consultation process. Before initiating any project-level actions that could result in
37 discharge into jurisdictional features, Reclamation will apply for a Section 10 permit
38 from the Corps.

1 ***Federal Endangered Species Act of 1973, as Amended***

2 The Federal Endangered Species Act (ESA) (16 USC 1531 et seq.) is a mechanism for
3 the protection and recovery of species threatened with extinction and includes, but is not
4 limited to, the following:

- 5 • A process to list species in danger of becoming extinct (Section 4).
- 6 • A prohibition on “take” of threatened and endangered species (Section 9).
- 7 • Processes for exemption from Section 9 take prohibitions when take is incidental
8 to, and not the purpose of, otherwise lawful activities (Section 7 and Section 10).

9 U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS)
10 share responsibility for regulatory implementation and enforcement of the ESA. USFWS
11 has jurisdiction over non-anadromous freshwater fish, wildlife and plant species, and
12 NMFS has jurisdiction over marine and anadromous species (e.g., Chinook salmon).
13 Both agencies, upon request, evaluate the effects of proposed projects to determine if the
14 proposed project will jeopardize the continued existence of a federally listed (threatened
15 or endangered) species or adversely modify designated critical habitat.

16 Section 7 of the ESA outlines procedures for Federal interagency cooperation for
17 implementation of the ESA. Section 7(a)(2) requires Federal agencies consult with
18 USFWS and/or NMFS to ensure that “any action authorized, funded, or carried out by
19 such agency” does not jeopardize the continued existence of a listed species or adversely
20 modify designated critical habitat. Regulations jointly issued by USFWS and NMFS
21 guide the consultation process.

22 When implementing Section 7(a)(2), there are three possible determinations that a
23 Federal agency can make: No Effect, may affect but is Not Likely to Adversely Affect,
24 and May Adversely Affect. If the Federal agency determines that the proposed action will
25 have No Effect upon listed species or designated critical habitats, and documents a
26 logical rationale and reasoning for that determination, then the agency’s ESA compliance
27 for that project is complete. If the agency makes a determination of Not Likely to
28 Adversely Affect, then it must seek concurrence from USFWS and/or NMFS with that
29 determination. Such determinations are made when the project is wholly beneficial to a
30 listed species, or the anticipated effects are insignificant and/or discountable (not likely
31 applicable for this proposed action). If the agency makes a May Adversely Affect
32 determination, then it must enter into a formal consultation which usually concludes with
33 the issuance of a Biological Opinion on whether the proposed activity will jeopardize the
34 continued existence of a listed species. Under the ESA, an action is determined to
35 jeopardize the continued existence of a species when it is reasonably expected, directly or
36 indirectly, to diminish a species’ numbers, reproduction, or distribution so that the
37 likelihood of survival and recovery in the wild is appreciably reduced.

38 Section 9 of the ESA prohibits the “take” of federally listed species. Take is defined,
39 under Section 3 of the ESA, as “harass, harm, pursue, hunt, shoot, wound, kill, trap,
40 capture, or collect, or attempt to engage in any such conduct.” Under Federal regulations,
41 “take” is further defined to include habitat modification or degradation when it actually

1 results in death or injury to wildlife by significantly impairing essential behavioral
2 patterns, including breeding, feeding, or sheltering. A Biological Opinion issued under
3 Section 7(a)(2) will include an Incidental Take Statement, which, among other purposes,
4 when fully implemented, serves as a formal exemption to the Section 9 prohibition for
5 that project.

6 Section 10 of the ESA addresses exceptions to the requirements found elsewhere in the
7 ESA. Section 10(j) permits establishing and maintaining experimental populations. The
8 Secretary of the Interior or the Secretary of Commerce may authorize the release (and
9 related transportation) of any population (including eggs, propagates, or individuals) of
10 an endangered or a threatened species outside the current range of such species, if the
11 Secretary determines that such release would further the conservation of such species.
12 Before authorizing the release of any experimental population, the Secretary must
13 identify the population and determine, on the basis of the best available information,
14 whether such a population is essential to the continued existence of an endangered or a
15 threatened species.

16 Several species that are federally listed as threatened or endangered potentially occur in
17 the Project area and implementation of the proposed action may result in adverse effects
18 to these species or their habitat. Because the action is proposed by a Federal agency and
19 requires Federal permits and approvals, and because Project implementation could
20 adversely affect federally listed species, formal Section 7 consultation with USFWS and
21 NMFS is required.

22 Reclamation and DWR coordinated with USFWS and NMFS early in the planning
23 process to incorporate ESA Section 7(a)(2) consultation for the incidental take of listed
24 species. Reclamation is continuing this process on an ongoing basis. An analysis of the
25 anticipated effects of the proposed action upon listed species and designated critical
26 habitats will be transmitted by Reclamation to USFWS and NMFS in a Biological
27 Assessment. Depending on the level of potential effect, USFWS and NMFS will either
28 provide concurrence or issue a Biological Opinion to address those actions. Reclamation
29 will not initiate any action that would affect a species federally listed as endangered or
30 threatened, without first completing the appropriate consultation(s) with USFWS or
31 NMFS and receiving formal notice that the action would not jeopardize the continued
32 existence of the listed species or adversely modify designated critical habitat.

33 ***Magnuson-Stevens Fishery Conservation and Management Act***

34 The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)
35 establishes a management system for national marine and estuarine fishery resources. The
36 purpose of the MSFCMA is to take immediate action to conserve and manage the fishery
37 resource off the United States coasts, and United States anadromous species, and promote
38 the protection of Essential Fish Habitat (EFH). NMFS requires that Federal projects
39 avoid adversely affecting EFH, as defined in the 1996 Sustainable Fisheries Act (Public
40 Law 104-297), and to stop or reverse the continued loss of fish habitats through the goals
41 of habitat protection, conservation, and enhancement.

1 This legislation requires that all Federal agencies consult with NMFS regarding actions or
2 proposed actions permitted, funded, or undertaken that may adversely affect “essential
3 fish habitat.” EFH is defined as “those waters and substrate necessary to fish for
4 spawning, breeding, feeding, or growth to maturity.” The MSFCMA states that migratory
5 routes to and from spawning grounds of anadromous fish are considered EFH. The phrase
6 “adversely affect” refers to the creation of any impact that reduces the quality or quantity
7 of EFH. Although the concept of EFH is similar to that of designated “critical habitat”
8 under the ESA, measures recommended to protect EFH by NMFS are advisory, not
9 prescriptive. Federal activities that occur outside EFH but that may, nonetheless, have an
10 impact on waters and substrate constituting EFH must also be considered in the
11 consultation process.

12 The MSFCMA requires all Federal agencies to consult with NMFS on activities or
13 proposed activities that are authorized, funded, or undertaken by that agency that may
14 adversely affect EFH. NMFS would then provide recommendations to conserve and
15 reduce impacts to EFH. Federal agencies are required to respond to EFH conservation
16 recommendations.

17 The MSFCMA states that consultation regarding EFH should be consolidated, where
18 appropriate, with the interagency consultation, coordination, and environmental review
19 procedures required by other Federal statutes, such as NEPA, Fish and Wildlife
20 Coordination Act (FWCA), CWA, and ESA. Consultation requirements for EFH
21 requirements can be satisfied through concurrent environmental compliance if the lead
22 agency provides NMFS with timely notification of actions that may adversely affect
23 EFH, and if the notification meets requirements for the EFH assessment.

24 Since the proposed action may have adverse effects to EFH, Reclamation will consult
25 with NMFS under the MSFCMA. Project-level EFH consultation would be included with
26 the consultation for Section 7 of the ESA.

27 ***Fish and Wildlife Coordination Act of 1934, as Amended***

28 Coordination under the FWCA is intended to promote conservation of fish and wildlife
29 resources by preventing their loss or damage and to provide for development and
30 improvement of fish and wildlife resources in connection with water projects.

31 Compliance with the FWCA involves assessing the impacts of the proposed action on
32 preservation, conservation, and enhancement of fish and wildlife habitat. Reclamation
33 will consider USFWS recommendations for preserving affected habitats, mitigating their
34 loss, and enhancing such habitats, which may be provided by USFWS in a Fish and
35 Wildlife Coordination Act Report. Documentation of compliance with the FWCA is a
36 separate analysis of habitats of concern to USFWS, NMFS, and DFW, and does not
37 replace the analysis required by Section 7 of the ESA.

38 Because the proposed action would affect surface waters, the FWCA is applicable.
39 Program-level compliance with the FWCA was documented in the SJRRP programmatic
40 Fish and Wildlife Coordination Act Report prepared by USFWS (SJRRP 2012a).
41 Subsequent FWCA reporting may also occur for project-level actions.

1 ***Federal Clean Air Act of 1963, as Amended***

2 The Federal Clean Air Act (CAA) was enacted to protect and enhance the Nation's air
3 quality to promote public health and welfare and the productive capacity of the Nation's
4 population. The CAA requires an evaluation of any Federal action to determine its
5 potential impact on air quality in the project region. California has a corresponding law,
6 which also must be considered during the preparation of the EIS/R. Most regulatory
7 responsibilities under the CAA are delegated to State, regional, or local government
8 bodies.

9 The CAA requires areas with unhealthy levels of ozone, carbon monoxide, nitrogen
10 dioxide, sulfur dioxide, and inhalable particulate matter to develop State Implementation
11 Plans (SIPs) to comply with the national ambient air quality standards (42 USC 7410 et
12 seq.). Federal agencies must conform to SIPs, meaning they must ensure that federally
13 supported activities will not cause or contribute to a new violation, increase the severity
14 of an existing violation, or delay timely attainment of any standard in any area (42 USC
15 7506(c)(1)(B)).

16 Proponents of specific projects must demonstrate that the actions will conform to the
17 CAA and the SIP. A Federal action conforms with an applicable SIP if (1) the total of
18 direct and indirect emissions from the action are compliant and consistent with the
19 requirements of the SIP, and (2) one of a list of enumerated, pollutant-specific
20 requirements is satisfied (such as accounting for the Federal action's projected emission
21 of any criteria pollutant in the SIP, or offsetting ozone or nitrogen dioxide emissions
22 within the nonattainment area) (42 CFR 93.158(a)). Ultimately, a conformity analysis
23 may require revising a SIP, implementing mitigation measures to bring the Federal
24 action's emissions levels down, or altering the action, possibly by reducing the magnitude
25 of the action, to reduce emissions to levels within the budgets established by the SIP for
26 specific pollutants.

27 Section 176 of the CAA prohibits Federal agencies from engaging in or supporting an
28 action or activity that does not conform to an applicable SIP. Actions and activities must
29 conform to a SIP's purpose of eliminating or reducing the severity and number of
30 violations of the national ambient air quality standards, and in attaining those standards
31 expeditiously.

32 Any Federal agency providing financial assistance, issuing a license or permit, or
33 approving or supporting in any way a proposed project located in a nonattainment or
34 maintenance area for a criteria air pollutant is required to issue a conformity analysis. The
35 conformity analysis must certify that the federally permitted project is consistent with the
36 SIP developed pursuant to the CAA. A conformity analysis is required unless the
37 proposed action's emissions are below the federally established *de minimis* emissions
38 thresholds, and the proposed action's emissions do not reach the level of 10 percent or
39 more of the regional emissions budget for any given pollutant in the nonattainment area.
40 This is also applicable to short-term, construction-related emissions, and therefore applies
41 to the Project.

1 A conformity analysis is typically performed concurrently with the permitting process of
2 the Federal permit being sought. Project-level actions would conform with CAA and SIP
3 as described in Chapter 4.0, “Air Quality.”

4 ***Federal Water Project Recreation Act of 1965, as Amended***

5 The Federal Water Project Recreation Act requires Federal agencies with authority to
6 require water projects to include recreation development as a condition of approving
7 permits. Recreation development must be considered along with any navigation, flood
8 control, reclamation, hydroelectric, or multipurpose water resources project that affects
9 water-related recreation on federally owned or operated land and waters. The Federal
10 Water Project Recreation Act states that “full consideration shall be given to the
11 opportunities, if any, which the project affords for outdoor recreation and for fish and
12 wildlife enhancement and that, wherever any such project can reasonably serve either or
13 both of these purposes consistently with the provisions of this Act, it shall be constructed,
14 operated, and maintained accordingly.” Planning for a project's recreation potential must
15 be coordinated with existing and planned federal, state or local public recreation
16 developments.

17 Compliance with the Federal Water Project Recreation Act is achieved through
18 documented consideration of recreation opportunities in NEPA documents and is
19 addressed in this EIS/R.

20 ***Safe Drinking Water Act of 1974, as Amended***

21 The Safe Drinking Water Act mandates that EPA establishes regulations to protect
22 human health from contaminants in drinking water. The law authorizes EPA to develop
23 national drinking water standards and create a joint Federal-State/Tribal system for
24 compliance with these standards. The Safe Drinking Water Act also directs EPA to
25 protect underground sources of drinking water through the control of underground
26 injection of liquid wastes.

27 EPA developed primary and secondary drinking water standards under the authority of
28 the Safe Drinking Water Act. EPA and authorized states and tribes enforce the primary
29 drinking water standards, which are contaminant-specific concentration limits that apply
30 to certain public drinking water supplies. Primary drinking water standards consist of
31 maximum contaminant-level goals, which are nonenforceable health-based goals, and
32 maximum contaminant levels, which are enforceable limits set as close to maximum
33 contaminant-level goals as possible, considering cost and feasibility of attainment.

34 Water used for domestic purposes is required to be treated by the local or regional water
35 supply in accordance with Federal and State standards. Reclamation is in compliance
36 with the Safe Drinking Water Act because implementing the Project would not change
37 existing license requirements or impede enforcement of primary drinking water
38 standards. Therefore, it is assumed no further analysis is needed for project-level actions.

39 ***National Historic Preservation Act of 1966, as Amended***

40 Section 106 of the National Historic Preservation Act of 1966 and its implementing
41 regulations (36 CFR Part 800, as amended) require Federal agencies to consider the

1 effects of their actions, or those they fund or permit, on properties that may be eligible for
2 listing or are listed in the National Register of Historic Places (NRHP). The NRHP is a
3 register of districts, sites, buildings, structures, and objects of significance in American
4 history, architecture, archaeology, engineering, and culture.

5 During this process, the Federal agency is usually required to consult with the State
6 Historic Preservation Officer (SHPO) and in some instances the Advisory Council on
7 Historic Preservation, an independent Federal agency that advises the President and
8 Congress on national historic preservation policy and administers the National Historic
9 Preservation Act's Section 106 review process. The National Historic Preservation Act
10 also requires that, in carrying out the requirements of Section 106, each Federal agency
11 must consult with any Indian tribe that attaches religious and cultural significance to
12 historic properties that may be affected by the agency's undertakings.

13 The proposed action would affect properties that are listed or eligible for listing on the
14 NRHP (16 USC 470 as amended). Project-level actions could also result in the
15 disturbance or destruction of cultural resources, as described in Chapter 9.0, "Cultural
16 Resources." To mitigate these potential impacts, Reclamation will develop a
17 Programmatic Agreement with the SHPO through the Section 106 consultation process.

18 ***Farmland Protection Policy Act of 1981***

19 The Farmland Protection Policy Act requires that a Federal agency examine the potential
20 impacts of a proposed action on prime and unique farmland, as defined by the Natural
21 Resources Conservation Service and, if the action would adversely affect farmland
22 preservation, consider alternatives to lessen the adverse effects. As a Federal agency
23 preparing environmental compliance documents, Reclamation is required to conduct a
24 farmland assessment designed to minimize adverse impacts on prime and unique
25 farmlands and provide for mitigation, as appropriate.

26 This EIS/R evaluates the conversion of prime and unique farmland to other uses that
27 would result from any project-level actions, as described in Chapter 16.0, "Land Use
28 Planning and Agricultural Resources." Mitigation measures have been identified for
29 farmland conversion, and include avoidance to the maximum amount practicable and
30 feasible. Reclamation has demonstrated compliance with the Farmland Protection Policy
31 Act through avoidance and mitigation for project-level actions.

32 ***Migratory Bird Treaty Act of 1918***

33 The Migratory Bird Treaty Act (MBTA), first enacted in 1918, implements domestically
34 a series of treaties between the United States, Great Britain (on behalf of Canada),
35 Mexico, Japan, and the former Soviet Union, and provides for international migratory
36 bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking
37 of migratory birds; the act provides that it shall be unlawful, except as permitted by
38 regulations, "to pursue, hunt, take, capture, kill, attempt to take, capture, or kill... any
39 migratory bird, [or] any part, nest, or egg of any such bird ..." (16 USC 703). This
40 prohibition includes both direct and indirect actions, although harassment and habitat
41 modification are not included unless they result in direct loss of birds, nests, or eggs. The
42 current list of species protected by the MBTA includes several hundred species and

1 essentially all native birds. The act offers no statutory or regulatory mechanism for
2 obtaining an incidental take permit for the loss of nongame migratory birds.

3 This EIS/R evaluates potential project-level impacts to migratory bird species and
4 identifies conservation strategies to avoid direct and indirect take of birds, active nests, or
5 eggs. Reclamation would comply with the MBTA through implementing the
6 conservation strategies described herein before and during implementation of any project-
7 level actions.

8 ***Executive Order 13186 (Migratory Birds)***

9 EO 13186 directs Federal agencies to take certain actions to further implement the
10 MBTA and outlines the responsibilities of Federal agencies to protect migratory birds.
11 Specifically, this order directs Federal agencies with direct activities that will likely result
12 in the take of migratory birds, to develop and implement a Memorandum of
13 Understanding (MOU) with the USFWS that shall promote the conservation of migratory
14 bird populations, with emphasis on species of concern. Reclamation has not finalized the
15 MOU required in this order pending Department of Interior guidance. Reclamation has
16 begun implementing the conservation measures set forth in this order, however, as
17 appropriate and applicable.

18 Birds protected under the MBTA include all common songbirds, waterfowl, shorebirds,
19 hawks, owls, eagles, ravens, crows, native doves and pigeons, swifts, martins, swallows,
20 and others, including their body parts (feathers, plumes, etc.), nests, and eggs. A complete
21 list of protected species is found at 50 CFR 10.13. Project activities that are most likely to
22 result in take of migratory birds include, but are not limited to, clearing or grubbing of
23 migratory bird nesting habitat during the nesting season when eggs or young are likely to
24 be present. Efforts will be made to remove nesting habitat or inactive nests of migratory
25 birds outside of the bird breeding season, and such activities will occur in coordination
26 with the USFWS office with local jurisdiction.

27 ***Bald and Golden Eagle Protection Act***

28 The Bald Eagle Protection Act (16 USC 668 668d, 54 Stat. 250) as amended, provides
29 protection for the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila*
30 *chrysaetos*) by prohibiting the taking, possession, and commerce of such birds, their
31 nests, eggs, or feathers unless expressly authorized by permit pursuant to Federal
32 regulations. This EIS/R includes an environmental commitment to avoid and minimize
33 effects to bald and golden eagles, as defined in the Bald and Golden Eagle Protection Act
34 (see Conservation Measure EAGLE-1).

35 ***Indian Trust Assets***

36 All Federal agencies have a responsibility to protect Indian Trust Assets. Indian Trust
37 Assets are legal interests in assets held in trust by the Federal government for Native
38 American tribes or individuals. Assets may be owned property, physical assets, intangible
39 property rights, a lease, or the right to use something, and typically include lands,
40 minerals, water rights, hunting and fishing rights, natural resources, money, or claims. If
41 Indian Trust Assets are affected by the project-level actions, Reclamation would identify
42 mitigation or compensation measures so that no net loss is incurred by the Native

1 American beneficial owners of the asset. As described in Section 3.3, project-level
2 actions would not affect Indian Trust Assets.

3 ***Native American Graves Protection and Repatriation Act***

4 The Native American Graves Protection and Repatriation Act (25 USC 3001 to 3013)
5 sets provisions for the removal and inadvertent discovery of human remains and other
6 cultural items on Federal and tribal lands. The Native American Graves Protection and
7 Repatriation Act clarifies the ownership of human remains and sets forth a process for
8 repatriation of human remains and associated funerary objects and sacred religious
9 objects to the Native American tribes or tribes likely to be lineal descendants or culturally
10 affiliated with the discovered remains or objects.

11 ***Executive Order 11988 – Floodplain Management***

12 EO 11988 is a flood hazard policy for all Federal agencies that manage Federal lands,
13 sponsor Federal projects, or provide Federal funds to State or local projects. It requires
14 that all Federal agencies take necessary action to reduce the risk of flood loss; restore and
15 preserve the natural and beneficial values served by floodplains; and minimize the
16 impacts of floods on human safety, health, and welfare. Specifically, EO 11988 dictates
17 that all Federal agencies avoid construction or management practices that would
18 adversely affect floodplains, unless an agency finds that no practical alternative exists
19 and the proposed action has been designed or modified to minimize harm or risk to
20 structures or facilities located within the floodplain.

21 This EIS/R evaluates potential project-level modifications to floodplains. The Project
22 alternatives include commitments to minimize adverse effects to floodplains.

23 ***Executive Order 11990 – Protection of Wetlands***

24 EO 11990 is an overall wetlands policy for all agencies that manage Federal lands,
25 sponsor Federal projects, or provide Federal funds to State or local projects. This EO
26 requires Federal agencies to follow avoidance, mitigation, and preservation procedures
27 with public input before they propose new construction in wetlands. EO 11990 can
28 restrict the sale of Federal land containing wetlands; however, it does not apply to
29 Federal discretionary authority for non-Federal projects (other than funding) on non-
30 Federal land.

31 This EIS/R evaluates potential impacts to wetlands from project-level actions. The
32 alternatives include conservation measures which incorporate avoidance and preservation
33 procedures, including restoration enhancement and replacement of wetlands.

34 Note that projects requiring compliance with EO 11990 are likely to require a permit
35 under CWA Section 404 and the assessment of effects of the proposed action on wetlands
36 is closely coordinated with the Section 404 process.

37 ***Executive Order 12898 – Environmental Justice in Minority and Low-Income***
38 ***Populations***

39 EO 12898 requires Federal agencies to identify and address disproportionately high and
40 adverse human health and environmental effects of Federal programs, policies, and

1 activities on minority and low-income populations. These effects are to be considered in
2 terms of both their frequency and magnitude. The requirements of EO 12898 apply to all
3 Federal actions that are located on Federal lands, sponsored by a Federal agency, or
4 funded with Federal monies, and that may affect minority or low-income populations.

5 To demonstrate compliance with EO 12898, the lead agency must show that it has
6 considered the effects of the proposed action on minority and low-income populations
7 and must design the proposed action to ensure that the action does not result, either
8 directly or indirectly, in discrimination on the basis of race, color, or national origin. In
9 all cases, the agency must undertake specific outreach to any identified minority and low-
10 income populations. This outreach is to be specifically targeted to allow environmental
11 justice populations to fully participate in the public involvement process.

12 This EIS/R evaluates whether the identified adverse human health and environmental
13 effects from project-level actions would disproportionately affect minority and low-
14 income populations. With publication of the socioeconomic analysis and environmental
15 justice evaluations in this EIS/R, Reclamation solicits public comment and further
16 inclusion of these populations in the planning process. Reclamation's compliance with
17 EO 12898 has been accomplished thus far in the planning process and will continue
18 through Project implementation.

19 ***Executive Order 13007 (Indian Sacred Sites) and April 29, 1994, Executive***
20 ***Memorandum***

21 EO 13007 requires that Federal agencies with land management responsibilities
22 accommodate access to and ceremonial use of Indian sacred sites by Indian religious
23 practitioners. This EO further requires that those agencies avoid adversely affecting the
24 physical integrity of such sacred sites. Where appropriate, agencies also must maintain
25 the confidentiality of sacred sites. Other requirements stipulate that the agencies provide
26 reasonable notice of proposed actions or land management policies that may restrict
27 future access to or ceremonial use of sacred sites, or that may adversely affect the
28 physical integrity of sacred sites. The agencies must comply with the April 29, 1994,
29 executive memorandum, "Government-to-Government Relations with Native American
30 Tribal Governments."

31 Reclamation received information from Native American Heritage Commission about
32 which Native American groups would be interested in Project actions. Reclamation
33 mailed letters requesting their comments on November 30, 2010. Also, these Native
34 American groups were notified of the public scoping meetings and are included in the
35 distribution list for this EIS/R. Reaching out to Native American groups, including the
36 groups that participated in scoping and review of this EIS/R, demonstrates that
37 Reclamation has complied with EO 13007. If an Indian sacred site is encountered within
38 the Project area, measures will be implemented to prevent any restriction of access or
39 effect on the site's physical integrity. Continued compliance with this EO would be
40 demonstrated through implementation of mitigation measures, as needed.

Executive Order 13112 – National Invasive Species Management Plan

EO 13112 directs all Federal agencies to prevent and control introductions of invasive nonnative species in a cost-effective and environmentally sound manner and to minimize economic, ecological, and human health impacts. EO 13112 established a national Invasive Species Council made up of Federal agencies and departments and a supporting Invasive Species Advisory Committee composed of State, local, and private entities. The Invasive Species Council and Advisory Committee oversee and facilitate implementation of the EO, including preparing a national management plan for invasive species.

An invasive species management plan is included in the PEIS/R and includes methods for managing the spread of invasive plant species from project and program-level actions. Project-level restoration activities and planning will be integrated with the programmatic invasive species management plan. Reclamation would demonstrate continued compliance with this EO by implementing the methods described in the invasive species management plan.

Federal Transit Administration

To address the human response to groundborne vibration, Federal Transit Administration (FTA) has set forth guidelines for criteria related to maximum acceptable vibration for different types of land uses. For frequent events, these include 65 vibration decibels (VdB) for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-technology manufacturing, and laboratory facilities), 72 VdB for residential uses and buildings where people normally sleep, and 75 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, and offices) (FTA 2006).

Standards have also been established to address the potential for groundborne vibration to cause structural damage to buildings. These standards were developed by the Committee of Hearing, Bioacoustics, and Biomechanics at the request of EPA (FTA 2006). For fragile structures, the Committee of Hearing, Bioacoustics, and Biomechanics recommends a maximum limit of 0.25 in/sec peak particle velocity (FTA 2006). Peak particle velocity is a measure of the intensity of ground vibration, specifically the time rate of change of the amplitude of ground vibration.

This EIS/R evaluates potential groundborne vibration impacts on sensitive receptors, including the maximum sensitivity of 65 VdB described above. The rate of 65 VdB could be generated by pile-driving activities. Reclamation has demonstrated consistency with this policy by evaluating project-level actions that would generate the maximum possible groundborne vibration at the highest sensitive uses. Reclamation also has included mitigation measures to reduce the impact in accordance with this policy. Implementation of the mitigation measures would demonstrate that Reclamation would be consistent with the FTA policy for groundborne vibration.

National Wild and Scenic Rivers System

The National Wild and Scenic Rivers Act of 1968, as amended (Public Law 90-542; 16 USC 1271–1287), established the National Wild and Scenic Rivers System, which identifies distinguished rivers of the Nation that possess outstandingly remarkable scenic,

1 recreation, geologic, fish and wildlife, historic, cultural, or other related values. This act
2 preserves the free-flowing condition of the rivers so designated and protects their local
3 environments. Section 5(d)(1) of the act requires that all Federal agencies, when planning
4 for the use and development of water and related land resources, shall consider potential
5 national wild, scenic, and recreational river areas.

6 The San Joaquin River is not designated as a Wild and Scenic River in the Project area.
7 Compliance with this law is not relevant to implementation of the Settlement.

8 ***U.S. Coast Guard***

9 Under the General Bridge Act of 1946 and Section 9 of the RHA, the U.S. Coast Guard is
10 responsible for approval of the location and plans of bridges and causeways constructed
11 across navigable waters of the United States. In addition, the Coast Guard is responsible
12 for approval of the location and plans of international bridges and the alteration of
13 bridges found to be unreasonable obstructions to navigation. The purpose of regulating
14 bridge construction under the General Bridge Act and Section 9 of the RHA is to
15 preserve the public right of navigation and to prevent interference with interstate and
16 foreign commerce. Project-level actions are not anticipated to affect the locations or plans
17 of bridges or causeways constructed across navigable waters of the United States.

18 **27.1.2 State Requirements**

19 Compliance with State laws, rules, and regulations for implementation of the alternatives
20 are summarized below.

21 ***California Environmental Quality Act***

22 Prompted by the passage of NEPA in 1969, CEQA was signed into law in 1970 as
23 California's counterpart to NEPA. CEQA is a statute that requires State and local
24 agencies to identify the significant environmental impacts of their actions and avoid or
25 mitigate those impacts, if feasible. The objectives of CEQA are to do all of the following:

- 26 • Disclose to decision-makers and the public the significant environmental effects
27 of proposed activities.
- 28 • Identify ways to avoid or reduce environmental damage.
- 29 • Prevent environmental damage by requiring implementation of feasible
30 alternatives or mitigation measures.
- 31 • Disclose to the public reasons for agency approval of projects with significant
32 environmental effects.
- 33 • Foster interagency coordination in the review of projects.
- 34 • Enhance public participation in the planning process.

35 Depending on the potential impacts of a proposed project, environmental information is
36 presented in one of three CEQA documents: a Notice of Exemption, an Initial Study
37 supporting either a Negative Declaration or Mitigated Negative Declaration, or an
38 Environmental Impact Report (EIR).

1 As NEPA and CEQA lead agencies, respectively, Reclamation and CSLC collaborated to
 2 prepare this joint EIS/R. Project-level actions are analyzed in this EIS/R at a project-
 3 specific level. This document identifies anticipated and probable significant effects of the
 4 project-level actions, as well as feasible mitigation measures. This document also
 5 compares No-Project (No Action) Alternative and project (action) alternatives to existing
 6 conditions to allow evaluation of their relative environmental consequences.

7 **California Endangered Species Act**

8 Pursuant to the California Endangered Species Act (CESA) (Fish and G. Code, § 2050 et
 9 seq.), a permit from DFW may be required for projects that could result in the take of a
 10 plant or animal species that is State-listed as threatened, endangered or as a candidate
 11 species. Under CESA, the term “endangered species” is defined as a species of plant,
 12 fish, or wildlife that is “in serious danger of becoming extinct throughout all, or a
 13 significant portion of, its range” and is limited to species or subspecies native to
 14 California. Under CESA, “take” is defined as an activity that would directly or indirectly
 15 kill an individual of a species, but unlike the Federal ESA, the CESA definition of take
 16 does not include “harming” or “harassing.” Section 86 of the California Fish and Game
 17 Code defines take as to “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue,
 18 catch, capture, or kill.”

19 Sections 2080 and 2081 of the California Fish and Game Code cover the “take” of State
 20 threatened and endangered species. One of two CESA-compliance processes is generally
 21 followed when take of a State-listed species may occur, the Section 2080.1 consistency
 22 determination or Section 2081 incidental take permit processes. Section 2080.1 allows an
 23 applicant who has obtained a Federal incidental take statement through Section 7
 24 consultation to request that DFW issue a consistency determination stating that the
 25 Federal document is “consistent” with CESA. A Section 2081 incidental take permit is
 26 used if agreement cannot be reached about consistency.

27 Several State-listed threatened or endangered species potentially occur in the Project area
 28 and particularly near the San Joaquin River and in adjacent waterways such as the Fresno
 29 Slough, Little San Joaquin Slough, and the Mendota Pool. Implementation of the
 30 proposed action may result in adverse effects to these species or their habitat.
 31 Reclamation has involved DFW at the early stages of planning to incorporate avoidance
 32 measures for State-listed species that may be affected.

33 California Fish and Game Code sections 3503 and 3503.5 state that it is unlawful to take,
 34 possess, or needlessly destroy the nest or eggs of any bird, and that it is unlawful to take,
 35 possess, or destroy any raptors (i.e., species in the orders *Falconiformes* and
 36 *Strigiformes*), including their nests or eggs. Typical violations of these codes include
 37 destruction of active nests resulting from removing vegetation in which the nests are
 38 located. Violation of section 3503.5 could also include failure of active raptor nests
 39 resulting from disturbance of nesting pairs by nearby project construction. This statute
 40 does not provide for issuing any type of incidental take permit.

41 This document identifies actions that would potentially disturb nesting birds. To comply
 42 with sections 3503 and 3503.5, this EIS/R describes conservation strategies to avoid

1 disturbing nesting birds per the requirements in the SJRRP 2012 Record of Decision
2 (SJRRP 2012b). These measures include conducting preconstruction surveys, ceasing
3 vegetation removal activities if the vegetation is occupied by active nests, and
4 establishing environmentally sensitive areas around nesting birds to minimize
5 construction disturbance of any nesting pair, and to avoid forced fledging.

6 **California Fish and Game Code – Fully Protected Species**

7 Protection of fully protected species is described in Fish and Game Code sections 3511,
8 4700, 5050, and 5515. These statutes prohibit take or possession of fully protected
9 species. DFW is unable to authorize incidental take of fully protected species when
10 activities are proposed in areas inhabited by those species. Reclamation and CSLC are
11 working closely with DFW to evaluate methods to avoid take of fully protected species.

12 This EIS/R evaluates potential project-level effects to blunt-nosed leopard lizard, a fully
13 protected species. The Project alternatives include environmental commitments for this
14 species (see Conservation Measures BNLL-1 and BNLL-2). These conservation
15 measures are designed to avoid any direct take of blunt-nosed leopard lizards.

16 **California Fish and Game Code Section 1602 – Streambed Alteration**

17 Diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any
18 river, stream, or lake in California that supports wildlife resources are subject to
19 regulation by DFW under Fish and Game Code section 1602. Under section 1602, as
20 applicable, it is unlawful for any person, governmental agency, or public utility to do the
21 following without first notifying DFW:

22 *...substantially divert or obstruct the natural flow of, or substantially*
23 *change or use any material from the bed, channel, or bank of any*
24 *river, stream, or lake, or deposit or dispose of debris, waste, or other*
25 *material containing crumbled, flaked, or ground pavement where it*
26 *may pass into any river, stream, or lake.*

27 A stream is defined as a body of water that flows at least periodically or intermittently
28 through a bed or channel that has banks and supports fish or other aquatic life. This
29 definition includes watercourses with a surface or subsurface flow that supports or has
30 supported riparian vegetation. DFW's jurisdiction within altered or artificial waterways is
31 based on the value of those waterways to fish and wildlife. As applicable, a DFW
32 streambed alteration agreement is obtained for any project that would result in an impact
33 on a river, stream, or lake.

34 This EIS/R identifies potential project-level actions that would alter stream features
35 subject to Fish and Game Code section 1602. The proposed action will substantially
36 divert or obstruct the natural flow or substantially change the bed, channel, or bank of a
37 river, stream, or lake or use materials from a streambed. Project proponents will, if
38 appropriate, apply for a Streambed Alteration Agreement from DFW.

1 Central Valley Flood Control Act of 2008

2 In 2007, the Governor signed five interrelated bills (flood legislation) aimed at
3 addressing the problems of flood protection and liability and helping to direct use of the
4 voter-approved bond funds provided by 2006 Propositions 1E and 84. These included
5 Senate Bill (SB) 5 and 17, and Assembly Bills (AB) 5, 70, and 156. A sixth bill passed in
6 2007, AB 162, required additional consideration of flood risk in local land use planning
7 throughout California. These bills, effective January 1, 2008, collectively added or
8 amended sections in the California Government Code, Health and Safety Code, Public
9 Resources Code, and California Water Code. Together, these bills outline a
10 comprehensive approach to improving flood management at the State and local levels,
11 with elements to address both the chance of flooding and the consequences when
12 flooding does occur.

13 The major piece of the flood legislation is the Central Valley Flood Protection Act of
14 2008, enacted by SB 5. This legislation seeks to address flood management problems in
15 the Sacramento-San Joaquin Valley by directing DWR to prepare a Central Valley Flood
16 Protection Plan by mid-2012 for adoption by the CVFPB. The Central Valley Flood
17 Protection Plan is intended to establish a system-wide approach to improving flood
18 management in areas currently receiving some amount of flood protection from existing
19 facilities of the Federal-State flood management system. The flood legislation also
20 establishes the 200-year flood event (flood with a 1-in-200 chance of occurring in any
21 year) as the minimum level of flood protection to be provided in urban and urbanizing
22 areas in the Sacramento-San Joaquin Valley.

23 The flood legislation also requires DWR and the CVFPB to adopt a schedule for mapping
24 flood risk areas in the Central Valley, and sets deadlines for cities and counties in the
25 Central Valley to amend their general plans and zoning ordinances to conform to the
26 Central Valley Flood Protection Plan within 24 months and 36 months, respectively, of
27 its adoption by the CVFPB. Once the general plan and zoning ordinance amendments are
28 enacted, the approval of development agreements and subdivision maps is subject to
29 restrictions in flood hazard zones. Central Valley counties are obligated to develop flood
30 emergency plans within 24 months of CVFPB adoption.

31 Reclamation and CSLC have jointly developed the proposed action in a manner that is
32 consistent with the Central Valley Flood Control Act, and which would not inhibit
33 development of the Central Valley Flood Protection Plan.

34 Central Valley Flood Protection Board Encroachment Permit

35 Under Title 23 of the California Code of Regulations, the CVFPB issues encroachment
36 permits to maintain the integrity and safety of flood control project levees and floodways
37 that were constructed according to flood control plans adopted by CVFPB or the
38 California Legislature. The CVFPB has jurisdiction over the levee section, the waterward
39 area between project levees, a 10-foot-wide strip adjacent to the landward levee toe,
40 within 30 feet of the top of the banks of unleveed project channels, and within designated
41 floodways adopted by the CVFPB. Activities outside of these limits that could adversely
42 affect the flood control project also fall under the jurisdiction of the CVFPB. In
43 accordance with the provisions of Title 33, CFR Section 208.10, all permit requests for

1 construction of improvements of any nature within the limits of a Federal project right-
2 of-way would be referred to the Corps District Engineer for review.

3 Project-level actions will require work along the San Joaquin River in areas that may be
4 subject to Title 23 because the river is managed for flood control and thus contains
5 features subject to the jurisdiction of CVFPB. The San Joaquin River is a regulated
6 stream and the proposed action could have an effect on the flood control functions of
7 project levees just east and north of the Chowchilla Bifurcation Structure or downstream
8 project levees. Project proponents will complete an encroachment permit application, as
9 needed, before performing any work along relevant reaches of the San Joaquin River that
10 contain flood control features subject to CVFPB jurisdiction.

11 ***California Water Code (Water Rights)***

12 A water right is a legally protected right, granted by law, to take control of water and to
13 put it to beneficial use. Under the California Water Code, the SWRCB is responsible for
14 allocating surface water rights and permitting the diversion and use of water throughout
15 the State. Through its Division of Water Rights, the SWRCB issues permits to store and
16 to divert water for new appropriations and it authorizes changes to existing water rights.
17 SWRCB attaches conditions to these permits to ensure that the water user prevents waste,
18 conserves water, does not infringe on the rights of others, and puts the State's water
19 resources to the most beneficial use.

20 An applicant, permittee, or licensee who wishes to change the point of diversion, place of
21 use, or purpose of use from that specified in an existing permit or license must petition
22 SWRCB to amend a water right. When considering a petition for a water right
23 amendment, SWRCB considers the same factors as those it considers when a water user
24 applies for a new permit, such as waste prevention, water conservation, infringement on
25 the rights of others, and public trust values.

26 Reclamation has filed petitions with the SWRCB for changes to its San Joaquin River
27 water rights permits and license to facilitate Program-level activities implementing the
28 SJRRP. Those petitions have already been approved. If Project actions require
29 Reclamation to request changes to its San Joaquin River water right permits, Reclamation
30 will review any comments submitted by the SWRCB on this EIS/R and would coordinate
31 with the SWRCB regarding this matter. If the SWRCB determines that the Project
32 requires changes to its San Joaquin River water rights permits, Reclamation would file
33 the appropriate petitions with the SWRCB. Any other entities claiming pre-1914
34 appropriative rights, for which changes to water rights are determined necessary, would
35 make those changes pursuant to California Water Code section 1706.

36 ***California Wild and Scenic Rivers Act***

37 The California Wild and Scenic Rivers Act of 1972, as amended (Pub. Resources Code, §
38 5093.50 et seq.), aims to preserve designated rivers possessing extraordinary scenic,
39 recreation, fishery, or wildlife values. Implementation of the Project alternatives would
40 not affect any State-designated wild and scenic river.

1 **California Harbors and Navigation Code**

2 The California Harbors and Navigation Code details the jurisdictions of the California
3 Department of Parks and Recreation, Division of Boating and Waterways, which focus
4 development of public access to waterways, safety of vessels and boating facilities, and
5 on-the-water safety. Coordination with the Division of Boating and Waterways regarding
6 design standards for future boating facilities could be required for installing new or
7 modifying existing boating facilities, such as boat ramps, docks, or marinas.

8 **Porter-Cologne Water Quality Control Act**

9 Under the Porter-Cologne Water Quality Control Act, “waters of the State” fall under the
10 jurisdiction of the appropriate RWQCB (in this case, the Central Valley RWQCB). Under
11 the act, the appropriate RWQCB must prepare and periodically update water quality
12 control basin plans. Each basin plan sets forth water quality standards for surface water
13 and groundwater, as well as actions to control point and nonpoint sources of pollution to
14 achieve and maintain these standards. Projects that affect wetlands or waters of the State
15 must meet the RWQCB’s waste discharge requirements, which may be issued in addition
16 to a water quality certification under Section 401 of the CWA. Waters of the State are
17 defined as “any surface water or groundwater, including saline waters, within the
18 boundaries of the State (Wat. Code, § 13050, subd. (e)) which include all waters within
19 the State’s boundaries, whether private or public, including waters in both natural and
20 artificial channels.”

21 Project-level actions that have the potential to adversely affect water quality are identified
22 in this document. Actions would be implemented consistent with implementation
23 programs under the water quality control plan for the Sacramento River and San Joaquin
24 River basins, as revised (Central Valley RWQCB 2011), and with the RWQCB’s waste
25 discharge requirements. Implementing some Project-level actions would include
26 application for NPDES permits and a Section 401 water quality certification.

27 **California Land Conservation Act of 1965 (Williamson Act)**

28 The California Land Conservation Act of 1965 (Gov. Code, § 51200 et seq.), commonly
29 known as the Williamson Act, is the principal method for encouraging the preservation of
30 agricultural lands in California. The Williamson Act enables local governments to enter
31 into contracts with private landowners for the purpose of restricting specific parcels of
32 land to agricultural or related open space use for 10 years. In return, landowners receive
33 property tax assessments based on farming and open space uses as opposed to full market
34 value. Local governments receive an annual subvention (subsidy) of forgone property tax
35 revenues from the State via the Open Space Subvention Act of 1971.

36 The Williamson Act empowers local governments to establish “agricultural preserves”
37 consisting of lands devoted to agricultural and other compatible uses. On establishment
38 of such preserves, the locality may offer to owners of included agricultural land the
39 opportunity to enter into annually renewable contracts that restrict the land for at least 10
40 years. In return, the landowner is guaranteed a relatively stable tax base, founded on the
41 value of the land for agricultural/open space use only, and unaffected by its development
42 potential.

1 Williamson Act contracts are for 10 years and longer. The contract is renewed
2 automatically each year, maintaining a constant, 10-year contract, unless the landowner
3 or local government files to initiate nonrenewal. Should that occur, the Williamson Act
4 would terminate 9 years after the filing of a notice of nonrenewal.

5 Because a public agency would acquire lands within agricultural preserves, including
6 lands under contract, the Project is exempt from the normal cancellation process for
7 Williamson Act contracts. This is because the contract is nullified for the portion of the
8 land actually acquired by a public agency (Gov. Code, § 51295). The lead agency must
9 provide notice to the California Department of Conservation (DOC) before acquiring
10 such lands (Gov. Code § 51291, subd. (b)). A second notice is required within 10
11 working days after the land is actually acquired (Gov. Code, § 51291, subd. (c)). The lead
12 agency would be exempt from the findings required in California Government Code
13 section 51292 (Gov. Code, § 51293, subd. (e)(2)) for the acquisition of lands under
14 Williamson Act contracts. Preliminary notice to DOC, provided before lands are actually
15 acquired, would demonstrate the purpose of the project and exemption from the findings.
16 DOC was provided a copy of this EIS/R, along with a request for comments.

17 Project-level actions would result in the need to acquire Important Farmland including
18 lands under Williamson Act contracts. The extent of lands that could be affected due to
19 proposed actions is described in Chapter 16.0, "Land Use Planning and Agricultural
20 Resources."

21 **California Clean Air Act**

22 The California Clean Air Act (CCAA) of 1988 requires nonattainment areas, such as the
23 San Joaquin Valley Air Basin, to achieve and maintain State ambient air quality standards
24 by the earliest practicable date. The CCAA also requires local air districts to develop
25 plans for attaining State ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide
26 standards. The San Joaquin Valley Air Pollution Control District (SJVAPCD) has the
27 authority to issue permits and ensure compliance with air quality regulations in the
28 Project area, as appropriate.

29 The SJVAPCD is required by the CCAA to develop "indirect source" control programs in
30 their attainment plans. The SJVAPCD is committed to reducing PM₁₀ and nitrous oxides
31 emissions from indirect sources in the 2003 PM₁₀ Plan and the 2004 Extreme Ozone
32 Attainment Demonstration Plan. The SJVAPCD's Governing Board adopted District
33 Rule 9510 as a result of this commitment. In accordance with SJVAPCD Rule 9510,
34 Indirect Source Review, applicants mitigate project impacts through the incorporation of
35 on-site emission reducing design elements and/or the payment of fees that would be used
36 to fund off-site emissions reduction projects.

37 In accordance with SJVAPCD Rule 8021 – Construction, Demolition, Excavation,
38 Extraction, and Other Earthmoving Activities, the owner or operator of a construction
39 project would submit a dust control plan to SJVAPCD if at any time the project would
40 involve:

- 1 • Residential developments of 10 or more acres of disturbed surface area.
- 2 • Nonresidential developments of 5 or more acres of disturbed surface area.
- 3 • Moving, depositing, or relocating of more than 2,500 cubic yards per day of bulk
- 4 materials on at least 3 days of the project.

5 A dust control plan identifies the fugitive dust sources at the construction site and
 6 describes the dust control measures to be implemented before, during, and after any dust-
 7 generating activity for the duration of the project. The owner or operator would comply
 8 with applicable rules under Regulation VIII.

9 This EIS/R evaluates the contribution of project-level actions to any violation of air
 10 quality standards and identifies mitigation measures to help achieve consistency with the
 11 SIP attainment goal before implementation of project-level actions.

12 Finally, because the proposed action would likely involve the construction of a
 13 nonresidential development of more than 5 acres of disturbed surface area and could
 14 involve moving, depositing, or relocating more than 2,500 cubic yards per day of bulk
 15 materials on at least 3 days, a dust control plan is required. Construction activities would
 16 not commence until the dust control plan has been approved or conditionally approved by
 17 the SJVAPCD.

18 ***Executive Order B-30-15***

19 EO B-30-15 was signed by Governor Brown in April 2015. This EO establishes a
 20 California greenhouse gas reduction target of 40 percent below 1990 levels by 2030. This
 21 target is in line with levels needed in the U.S. to limit global warming below 2 degrees
 22 Celsius and will also facilitate reaching the ultimate goal of reducing emissions 80
 23 percent under 1990 levels by 2050. The EO also specifically addresses the need for
 24 climate adaptation and directs State government to factor climate change into State
 25 agencies' planning decisions and to implement measures under existing agency and
 26 departmental authority to reduce greenhouse gas emissions.

27 This EIS/R evaluates project-level effect to climate change and greenhouse gas
 28 emissions. Implementation of mitigation measures for air quality would also result in
 29 GHG emission co-benefits and further reduce GHG emissions.

30 ***California Native Plant Protection Act***

31 The California Native Plant Protection Act of 1977 (Fish and G. Code, §§1900 – 1913)
 32 establishes criteria for the preservation, protection, and enhancement of endangered or
 33 rare native plants of the State. This act requires all State agencies to use their authority to
 34 carry out programs to conserve endangered and rare native plants. The California Native
 35 Plant Protection Act provides protection to “endangered” and “rare” plant species,
 36 subspecies, and varieties of wild native plants in California. The California Native Plant
 37 Protection Act’s definitions of “endangered” and “rare” closely parallel the CESA
 38 definitions of endangered and threatened plant species. All project-level actions are
 39 evaluated in this EIS/R for consistency with this act.

1 **California Native Plant Society Species Designations**

2 California Native Plant Society (CNPS) is a statewide nonprofit organization that seeks to
3 increase understanding of California’s native flora, and to preserve this rich resource for
4 future generations. CNPS has developed and maintains lists of vascular plants of special
5 concern in California. CNPS-listed species have no formal legal protection, but the value
6 and importance of these lists are widely recognized. CNPS List 1 and 2 species are
7 considered rare plants pursuant to section 15380 of CEQA, and it is recommended that
8 they be fully considered while preparing environmental documents relating to CEQA.
9 This EIS/R identifies plants of concern on CNPS lists that may be affected by project-
10 level actions, using these lists as a method of identifying species of concern.

11 **State Lands Commission Land Use Lease**

12 The CSLC was given authority and responsibility to manage and protect the important
13 natural and cultural resources on certain public lands within the State, and the public’s
14 rights to access these lands. The public lands under the commission’s jurisdiction are of
15 two distinct types: sovereign lands and school lands. Sovereign lands encompass
16 approximately 4 million acres. These lands include the beds of California’s naturally
17 navigable rivers, lakes, and streams, as well as the State’s tidal and submerged lands
18 along the coastline, extending from the shoreline to 3 nautical miles offshore. A project
19 cannot use these State lands unless a lease is first obtained from the CSLC.

20 The San Joaquin River is defined as “navigable in fact” from its mouth upstream to Friant
21 Dam near Fresno, and is therefore subject to the jurisdiction of the CSLC. Project-level
22 actions that require work on the San Joaquin River would require a lease from the CSLC.

23 **California Department of Transportation**

24 California Department of Transportation (Caltrans) is responsible for planning,
25 designing, construction, operating, and maintaining all State-owned roadways in
26 California. The Caltrans Highway Design Manual (2013a) establishes uniform policies
27 and procedures to carry out the Caltrans highway design functions. The highway design
28 criteria and policies in the manual provide a guide for applying standards in the design of
29 projects and, rather than implementing enforceable regulations, present information and
30 guidance.

31 Highway improvements or modifications, as may be needed for implementation of this
32 project, may require an encroachment permit as issued through Caltrans. The project may
33 involve modifications to roadways that Caltrans considers “complex” and require
34 extensive communication with the Caltrans Department of Engineering Services or
35 structure-specific encroachment permits. These are detailed in the Caltrans Encroachment
36 Permits Manual (2013b), which is available at the Caltrans website. Any improvements
37 to roadways subject to Caltrans jurisdiction would be subject to Caltrans design
38 standards, which would include standards for protecting cultural resources and structures.

39 Project-level actions may require improving or modifying roadways subject to Caltrans
40 jurisdiction. SR 30 and SR 180 are located within the Project area and are addressed in a
41 regional roadway traffic analysis completed for the Project. The analysis found that
42 Project construction would not affect existing levels of service on these routes.

1 **California Public Resources Code**

2 The Public Resources Code contains several sections relevant to the project. Some
3 examples include the California Park and Recreational Facilities Act of 1984 (§
4 5096.225) and the Federal Water Project Recreation Act (§ 5094). Compliance with these
5 acts is achieved by analyzing in this EIS/R (Chapter 20.0, “Recreation”) the impact of
6 project-level actions on recreation opportunities.

7 **California Surface Mining and Reclamation Act**

8 The California Surface Mining and Reclamation Act of 1975 (SMARA) (Pub. Resources
9 Code, § 2710 et seq.) addresses surface mining. Activities subject to SMARA include,
10 but are not limited to mining of minerals, gravel, and borrow material. SMARA applies
11 to an individual or entity that would disturb more than 1 acre or remove more than 1,000
12 cubic yards of material through surface mining activities, including the excavation of
13 borrow pits for soil material. The SMARA statute requires mitigation to reduce adverse
14 impacts on public health, property, and the environment and requires that mined lands are
15 reclaimed to a usable condition. SMARA also encourages the production, conservation,
16 and protection of the State’s mineral resources.

17 SMARA is implemented through ordinances for permitting developed by local-
18 government lead agencies that provide the regulatory framework under which local
19 mining and reclamation activities are conducted. The State Mining and Geology Board of
20 reviews the local ordinances compliance with the procedures established by SMARA.

21 In general, SMARA permitting requires the lead agency to approve a permit and
22 reclamation plan, and post approved financial assurance for reclamation of the mined
23 land. Compliance with reclamation plans may include, but is not limited to, revegetation
24 and landscaping requirements, restoration of aquatic or wildlife habitat, restoration of
25 water bodies and water quality, slope stability and erosion and drainage control, disposal
26 of hazardous materials, and other measures, if necessary.

27 This EIS/R analyzes anticipated impacts of project-level actions, including impacts
28 associated with removing borrow material. The project proponent will comply with
29 SMARA where appropriate. Reclamation has invited Fresno and Madera counties to be
30 cooperating agencies on this Project.

31 **California Register of Historical Resources**

32 Public Resources Code section 5024.1 establishes the California Register of Historical
33 Resources (CRHR). The CRHR lists all properties considered to be significant historical
34 resources in the State. The CRHR includes all properties listed or determined eligible for
35 listing on the NRHP, including properties evaluated under Section 106. The criteria for
36 listing are similar as those of the NRHP. CEQA section 21084.1 requires a finding of
37 significance for substantial adverse changes to historical resources and defines the term
38 “historical resources.” CEQA section 21083.2 and State CEQA Guidelines section
39 15064.5, subdivision (c) provide further definitions and guidance for archaeological sites
40 and their treatment. The lead agency is required to follow the established guidelines
41 during the CEQA process and is addressed in this EIS/R.

1 **California Native American Graves Protection and Repatriation Act**

2 The California Native American Graves Protection and Repatriation Act (Health & Saf.
3 Code, § 8010 et seq.) establishes a State repatriation policy intent that is consistent with
4 and facilitates implementation of the Federal Native American Graves Protection and
5 Repatriation Act. The act strives to ensure that all California Indian human remains and
6 cultural items are treated with dignity and respect, and encourages voluntary disclosure
7 and return of remains and cultural items by publicly funded agencies in California. If
8 human remains are encountered during Project construction, Reclamation will comply
9 with applicable laws and regulations regarding notification and disposition of the
10 remains.

11 **Executive Order B-10-11**

12 EO B-10-11 was signed by Governor Brown on September 9, 2011. This EO establishes
13 the role and responsibilities of the Governor’s Tribal Advisor and directs State agencies
14 and departments under the Governor’s executive control to communicate and consult
15 with Federally recognized tribes, other California Native Americans, and representatives
16 of tribal governments to provide meaningful input into the development of legislation,
17 regulations, rules, and policies on matters that may affect tribal communities.

18 **Assembly Bill 52**

19 AB 52, signed on September 25, 2014, amends CEQA, creates a new category of
20 environmental resources: “tribal cultural resources,” and imposes new requirements for
21 consultation for projects that may affect a tribal cultural resources (Public Resources
22 Code sections 5097.94, 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09,
23 21084.2, and 21084.3).

24 Reclamation received information from Native American Heritage Commission about
25 which Native American groups would be interested in Project actions. Reclamation
26 mailed letters requesting their comments on November 30, 2010. Also, these Native
27 American groups were notified of the public scoping meetings and are included in the
28 distribution list for this EIS/R. Reaching out to Native American groups, including the
29 groups that participated in scoping and review of this EIS/R, demonstrates compliance
30 with this EO B-10-11 and AB 52.

31 **27.1.3 Local Plans and Policies**

32 This EIS/R analyzes alternatives for consistency with the general plan policies of the
33 relevant counties and cities. These jurisdictions include the counties of Fresno and
34 Madera and the cities of Mendota and Firebaugh. Compliance with local plans and
35 polices for implementation of the alternatives is summarized below.

36 **California Government Code General Plan Requirement**

37 Government Code section 65300 et seq. requires California cities and counties to adopt
38 and implement general plans. A general plan is a comprehensive, long-term strategy
39 document that sets forth the expected location and general type of physical development
40 expected in the city or county preparing the document. The general plan also may
41 consider land outside its boundaries that, in the city’s or county’s judgment, may affect
42 land use activities within its borders. The general plan addresses a broad range of topics,

1 including, at a minimum, land use, circulation, housing, conservation, open space, noise,
 2 and safety. In addressing these topics, the general plan identifies goals, objectives,
 3 policies, principles, standards, and plan proposals that support the city's or county's
 4 vision for the area. The general plan is a long-range document that typically addresses
 5 development over a 20-year period.

6 Reclamation would notify the counties of Fresno and Madera, and their respective
 7 planning and public works departments, of any inconsistencies with local plans and
 8 ordinances, such as County general plans, zoning ordinances, grading requirements, and
 9 various use permits. Each county would determine the need for potential changes to the
 10 affected parcels' land use designations and the applicable zoning categories (for
 11 implementing the land use designations) as well as the need for a general plan
 12 amendment if there is a conflict between existing and proposed land uses.

13 **27.2 Consultation and Coordination**

14 Consultation and coordination for the Project included project scoping and consultation
 15 with agencies and organizations, as described in the following sections. Future
 16 consultation and coordination are also described in this section.

17 **27.2.1 Project Scoping**

18 Public scoping activities are conducted as part of compliance with both NEPA and
 19 CEQA. The scoping process helps to identify areas to be studied and to eliminate issues
 20 from detailed study that are not critical to the decision at hand. Additional information on
 21 Project scoping is discussed in the Public Scoping Report (SJRRP 2010).

22 ***Notice of Intent***

23 Reclamation published the Notice of Intent to prepare an EIS/R in the Federal Register
 24 (Vol. 74, No. 132, Monday July 13, 2009), as required by NEPA. The Notice of Intent is
 25 available at www.restoresjr.net.

26 ***Notice of Preparation***

27 DWR initiated the CEQA process by issuing a Notice of Preparation on July 13, 2009,
 28 and the Project was assigned State Clearinghouse Number 2009072044. The Notice of
 29 Preparation is available at www.restoresjr.net. Although initial CEQA actions were
 30 conducted by DWR, subsequent actions during the EIS/R process have been conducted
 31 by the CSLC as the State lead agency.

32 ***Public Scoping Meetings***

33 Reclamation and DWR held two public scoping meetings in July 2009, regarding
 34 preparation of an EIS/R for the Project. The first meeting was held in Fresno, California,
 35 on Tuesday, July 28, 2009, from 6:00 p.m. to 8:00 p.m. The second meeting took place in
 36 Firebaugh, California, on Wednesday, July 29, 2009, from 6:00 p.m. to 8:00 p.m. The
 37 location of the July 29, 2009 scoping meeting in Firebaugh was changed the morning of
 38 the meeting to accommodate an anticipated increase in audience numbers based on the
 39 preceding evening's scoping meeting in Fresno. The venue was moved from the

1 Firebaugh Community Center to the Firebaugh Middle School, a distance of about 0.5
2 mile. An email was sent at 1:30 p.m. to two primary stakeholder groups informing them
3 of the change of location. They, in turn, sent notifications to their members which
4 reached almost all of the evening's attendees. Additionally, a scoping meeting staff
5 person remained at the original location to direct people to the new location.
6 Approximately 130 people attended the two meetings, including members of the public,
7 landowners, elected officials, and representatives from public agencies.

8 To publicize the meetings, the lead agencies distributed notices (including a copy of the
9 Notice of Intent and Notice of Preparation) to approximately 960 interested parties in the
10 Project mailing list database, including Federal, State, and local agencies, elected
11 officials, irrigation districts, county planning departments, landowners, academics, and
12 other individuals that have shown an interest in the Project. A certified mailing was sent
13 out to specific State, Federal, and local agencies to meet CEQA requirements.

14 Print ads displaying the time, date, and location of the scoping meetings were published
15 in local area newspapers including the main sections of the *Fresno Bee* (July 15), *Visalia*
16 *Times-Delta* (July 15), *Firebaugh-Mendota Journal* (July 15), *Merced Sun-Star* (July 15),
17 and *Los Banos Enterprise* (July 17).

18 A press release was distributed by Reclamation on July 13, 2009, to Reclamation's media
19 lists, other newspapers and media outlets in the Reach 2B area (both English- and
20 Spanish-speaking), Farm Bureau publications for the counties of Fresno, Merced, and
21 Madera, the California Farm Bureau Federation's "Ag Alert" weekly newspaper, the
22 California Farmer, and the Capitol Press. Updated information on the scoping meetings
23 was also posted to the SJRRP website (www.restoresjr.net).

24 Meeting participants were greeted at the door and asked to sign in. All names were
25 entered into a database for the exclusive purpose of keeping participants up-to-date on
26 future activities, meetings, and Project information. Meeting materials available to
27 participants included:

- 28 • Agenda.
- 29 • PowerPoint presentation.
- 30 • Project press release.
- 31 • Spanish translation of the project press release.
- 32 • Notice of Intent and Notice of Preparation.
- 33 • SJRRP Update Newsletter.
- 34 • Speaker card.
- 35 • Comment card with an area map.

36 Both public meetings began with a PowerPoint presentation by Reclamation and DWR.
37 The presentation explained the purpose of the meeting, provided a history of the
38 Settlement, presented an overview of the key components of the Project, and described
39 the public scoping process. Following the presentation, participants were able to walk

1 around the room and discuss the project with Program staff members for the “open
2 house” portion of the meeting. Three stations with displays were set up and included:

- 3 • Project Process and Timeline.
- 4 • Project Information.
- 5 • Comments and Public Involvement.

6 A staff person was available to each station to talk with the public and answer questions
7 related to the project or overall Program. A Spanish-speaking interpreter was present at
8 both meetings.

9 Verbal and written comments were accepted by Reclamation and DWR during both
10 scoping meetings. A public comment session was held after the open house portion of the
11 meeting. Meeting participants were invited to provide verbal and written comments.
12 Participants were invited to submit written comments on the provided comment cards and
13 attached map. A court reporter attended both meetings to record all verbal comments.
14 Twelve verbal public comments were made at the Fresno scoping meeting, and ten verbal
15 comments were made at the Firebaugh scoping meeting.

16 Additionally, the agencies accepted written comments through mail, e- mail, and fax,
17 throughout the scoping period of July 13, 2009, through August 14, 2009. A total of 21
18 written documents were received and 11 participants provided verbal comments during
19 the scoping period.

20 The agencies, individuals, and nongovernmental organizations that provided comments
21 are presented in Table 27-2 and Table 27-3, respectively. Subsequent CEQA actions
22 during the EIS/R process have been conducted by the CSLC as the State lead agency.

**Table 27-1
List of Public Agencies That Provided Comments**

Public Agencies	Comment Type
Federal	
U.S. Department of the Army, Corps of Engineers, California South Branch – Paul Maniccia, Chief	Written
U.S. Environmental Protection Agency, Communities and Ecosystems Division, Environmental Review Office – Kathleen M. Goforth, Manager	Written
State	
California State Lands Commission – Marina R. Brand, Assistant Chief, Division of Environmental Planning and Management	Written
San Joaquin Valley Air Pollution Control District – Arnaud Marjollet, Permit Services Manager	Written
Regional and Local	
Central California Irrigation District – Chris White, General Manager	Verbal
City of Firebaugh – Jose Ramirez, City Manager	Verbal
Grassland Water District – David Widell, General Manger	Written
Mendota City Council – S. Les Capuchio	Written

**Table 27-1
List of Public Agencies That Provided Comments**

Public Agencies	Comment Type
Mendota Planning Commission – Ed Petry	Written
San Joaquin River Resource Management Coalition and San Joaquin River Exchange Contractors Water Authority – Mari Martin, RMC, and Steve Chedester, SJRECWA	Written and Verbal
San Joaquin River Exchange Contractors Water Authority – Steve Chedester, Executive Director	Written

**Table 27-2
List of Individuals and Nongovernmental Organizations that Provided Comments**

Individuals and Nongovernmental Organizations	Comment Type
1986 Mitigation Lands Trust – Steven Haugen, Trustee	Written
Bart Bohn, Fresno, CA	Written
Bill Ward, BB Limited, Landowner	Verbal
Carl Janzen, Madera, CA	Written
Chris Acree, Revive the San Joaquin	Verbal
Columbia Canal Company – Roy Catania and Chris Cardella	Verbal
Columbia Canal Company – Randy Houk, General Manager	Written
Donna Duckworth, Fresno, CA	Written
Ed Howard, Fresno, CA	Written
Fresno County Farm Bureau - Ryan Jacobsen, Executive Director	Written
Ken Samarin, Samarian Farms, Kerman	Verbal
Oscar and Marcia Sablan, Firebaugh, CA	Written
Paramount Farming Company – Mike Widhalm & Kimberly Brown	Written and Verbal
Richard Knight, Fresno, CA	Written
Rudolfo Rulloda	Written
San Luis Canal Company – Chase Hurley, General Manager	Written
Sandra Flores, Fresno Regional Foundation, Sr. Program Officer	Verbal
Walter Shubin, Individual, Kerman	Verbal

1 ***Other Public Outreach***

2 Reclamation and DWR conducted the following additional public outreach activities
3 since the scoping meetings:

- 4 • Issued public scoping report in February 2010 (SJRRP 2010).
5 • Requested comments on the Project from Native American groups identified by
6 the Native American Heritage Commission on November 30, 2010.
7 • Hosted regularly scheduled technical feedback meetings with subject-matter
8 experts, Settling Parties, affected stakeholders, and the general public to obtain
9 information or viewpoints from individual attendees.

- 1 • Gathered feedback on Project documents to discuss potential opportunities and
2 constraints that may have arisen.
- 3 • Developed and distributed a wide variety of Project information, including
4 quarterly program updates, two annual reports, news releases, fact sheets, and
5 brochures to keep the public informed.
- 6 • Developed a process and form for obtaining landowner permission for temporary
7 access to private property in support of field surveys.
- 8 • Established a landowner coordinator to serve as a technical resource and liaison
9 for program staff and landowners to conduct all field activities necessary for
10 successfully implementing the Settlement, and to inform potentially affected
11 property owners of field activities on their land.
- 12 • The Reach 2B floodplain pre-appraisal level themes and Mendota Pool Bypass
13 alignments were presented by DWR at the November 17, 2009, meeting.
- 14 • Project status updates, overview of the publically available project-specific
15 documents, concept refinement of the San Mateo Avenue crossing design and use
16 of Little San Joaquin Slough, and the alternatives development process were
17 presented and discussed, and comments were accepted at the May 27, 2010.
18 meeting.
- 19 • Project status updates, overview of new publically available project-specific
20 documents, and DWR's land acquisitions process were presented and discussed,
21 and comments were accepted at the March 24, 2011, meeting.
- 22 • The CSLC draft administrative maps for Reach 2B, a brief Program update, and a
23 Project update were presented at the October 3, 2011, meeting.
- 24 • The Project effects on Mendota Pool and other operations, details of Project
25 components, and effects on infrastructure using large-scale maps were presented
26 at the November 14, 2011, workshop.
- 27 • Overview of borrow material needs and the status of geotechnical explorations
28 was presented during the December 16, 2011, conference call.
- 29 • Project overview, status, and a brief review of the alternatives were presented to
30 stakeholders associated with Fresno Slough at the May 31, 2012, meeting.
- 31 • A meeting was held on January 29, 2013, to introduce the consensus-based
32 alternative concept and approach to the adjacent landowners, canal companies,
33 irrigation districts, levee districts, cities, and the Settling Parties. The consensus-
34 based alternative approach gives these entities the opportunity to provide input on
35 the Project course of action, and their input will be considered during the selection
36 of a preferred alternative.
- 37 • In addition, many calls and emails were exchanged with individual landowners to
38 discuss specific issues.

39 Engagement of local governments, nongovernmental organizations, and individuals, as
40 well as coordination between the SJRRP and agencies, has been and continues to be
41 facilitated through SJRRP Work Groups. Continuation of scheduled meetings and open

1 sharing of information via the SJRRP website are evidence of this commitment. MOUs
2 were prepared, as required, for cooperating agencies under NEPA, and continued
3 collaboration with responsible agencies, especially those with a trust responsibility, is a
4 goal and commitment of the SJRRP (see Section 27.3.2 regarding the role of cooperating
5 and responsible agencies). Continued involvement and open sharing of information
6 through the SJRRP website show that the comments raised regarding public outreach are
7 recognized. The need to balance open sharing of information with adherence to agency
8 responsibilities will continue to be a goal.

9 ***Public Issues and Major Areas of Controversy***

10 A public scoping report dated February 2010, summarizes the results of the scoping
11 meetings and comments received), and is available to the public on the SJRRP website.
12 The comments received assisted Reclamation and DWR in identifying the range of
13 actions, alternatives, site design options, environmental resources, and mitigation
14 measures that are analyzed in the EIS/R. Subsequent CEQA actions during the EIS/R
15 process have been conducted by the CSLC as the State lead agency.

16 This section presents a summary of the comments received during the scoping process. If
17 a similar comment was received from multiple participants, the comments were
18 combined and reported as one comment.

19 **Agriculture Related Comments**

- 20 • Several landowners request a river restoration program with sustainable
21 agriculture.
- 22 • Evaluate crop use, seepage, drainage, delivery systems, and access on both sides
23 of Reach 2B on properties to be purchased for the project.
- 24 • Address current and/or potential drainage issues as related to crops and other land
25 uses.
- 26 • Develop mitigation measures to eliminate impacts to crop loss and property
27 destruction due to flooding and seepage.
- 28 • Outline a process for Project-related land purchases.
- 29 • Identify a manageable process for recourse for individual landowners that have
30 been damaged by the Project and identify funding to alleviate potential lawsuits.
- 31 • Cooperate with local landowners and use local inherent knowledge.

32 **Air Quality Related Comments**

- 33 • Describe existing air quality conditions.
- 34 • Describe the regulatory environment.
- 35 • Include a discussion of the project including existing and post-project emissions
36 and short-term and long term activities emissions.
- 37 • Evaluate significant impacts to air quality from construction detours around
38 Mendota Pool Bypass.
- 39 • Evaluate potential health impacts of Toxic Air Contaminants to near-by receptors.

- 1 • Include a discussion of nuisance odors.
- 2 • Discuss feasible measures that will reduce air quality impacts.
- 3 • Include a discussion of cumulative air impacts.
- 4 • Include a discussion of greenhouse gas emissions consistent with the California
- 5 Global Warming Solutions Act (AB 32).

6 **Canal Distribution System Comments**

- 7 • Ensure no interruption in water deliveries as a result of the Project.
- 8 • Ensure priority of the Exchange Contractor deliveries from the Friant system
- 9 through the river channel.
- 10 • Discuss necessary relocations of pumps on the river and the necessity to be
- 11 screened so as to be operable at all times.
- 12 • Evaluate and address relift wells and tailwater return systems.
- 13 • Evaluate the Columbia-Mowry Distribution System including the redesign of
- 14 facility access, facility operation and maintenance, pumps, pipelines, and power
- 15 (Pacific Gas and Electric Company/Western Area Power Administration).

16 **Economic Development Comments**

- 17 • Identify a method to quantify loss of farmlands in regional dollars.
- 18 • Evaluate the cumulative effects of taking primary farm land out of production to
- 19 the economy of Firebaugh and Mendota.
- 20 • Acquire land to support recreation, tourism, flora, fauna and groundwater
- 21 recharge.
- 22 • Evaluate the temporary and permanent loss of recreation resources in the specific
- 23 areas during the construction of levees and flood control facilities.

24 **Flood Control and Levee Comments**

- 25 • The Project may be subject to 33 CFR 208.10 (encroachment of Federal flood
- 26 control feature) or 33 USC 408 (alteration of Federal project).
- 27 • The Project may require a CVFPB encroachment permit as well as geotechnical
- 28 analysis of the Project locations.
- 29 • Evaluate access from public roads and operation and maintenance costs on land
- 30 purchased for the project.
- 31 • Identify who is responsible for cost of levee construction/maintenance.
- 32 • Evaluate shortening the channel distance to reduce levee length and maintenance
- 33 costs.
- 34 • Evaluate the installation of cutoff channels before the river bends just downstream
- 35 of the existing bifurcation structure to reduce flooding toward Highway 180.
- 36 • Evaluate channel capacity and flooding.

- 1 • Include an evaluation of flood protection (Reclamation, Lower San Joaquin Levee
2 District, the Corps, Kings River) and/or seepage control.
- 3 • Evaluate Reach 2B flood waters that may intercept the little San Joaquin Slough
4 and enter into the Fresno Slough.
- 5 • Evaluate the noise and vibration impacts on fish and birds from construction
6 activities in the water, on the levees, and land-side supporting structures and flood
7 control facilities.

8 **Groundwater and Wells Comments**

- 9 • Evaluate the relocation and reconnection of existing wells.
- 10 • Include a model and quantitative analyses of shallow ground water to evaluate
11 potential river impacts.
- 12 • Use existing monitoring wells and production wells to assess rising groundwater
13 as a result of this project.
- 14 • Include modeling and real time data collection before, during, after project
15 completion.
- 16 • An ongoing ground water seepage monitoring and management plan should be
17 included for Reach 2B and Mendota Pool.
- 18 • Benefits to ground water that are the result of the program flows should stay as a
19 right to the overlying landowner.

20 **Interim Flows Comments**

- 21 • Interim flows are not similar to historical flow conditions.
- 22 • Interim flows do not simulate natural flooding conditions and analysis of Reach
23 2B should not proceed until flow data are available.
- 24 • Interim flows were not to be started until design and costs of all fish screens were
25 determined and financial resources available.

26 **Project Alternatives**

- 27 • The Project needs to explore all alternatives that allow fish passage while taking
28 least amount of prime farm land out of production.
- 29 • Use existing river channels.
- 30 • Evaluate the shortest route for the Mendota Pool Bypass.
- 31 • Evaluate the construction of a 1-mile bypass channel just north of Mendota Pool.
- 32 • Some local landowners support the planning and design of the alternative
33 proposed by the Columbia Canal Company.
- 34 • Evaluate the installation of a wall across the river and north of Mendota Pool,
35 with gate to divert water to Mendota Pool.
- 36 • Produce options that look at creative ways to put water into the Mendota Pool.
- 37 • Identify options that include water circulation through the Mendota Pool.

- 1 • Instead of digging new channels use the original channels and remove all
- 2 obstructions in the river.
- 3 • Evaluate constructing the river channel deeper instead of building taller levees.
- 4 • The Project should include a fish diversion and fish screen facility for flows in the
- 5 Mendota Pool as well as other fish screen locations along Reach 2B.
- 6 • Several landowners support the installation of fish screens on the inlet to the
- 7 Mendota Pool at the new Bifurcation Structure near the head of the new Mendota
- 8 Pool Bypass.
- 9 • The Program needs to adhere to the San Joaquin River Settlement Agreement and
- 10 the San Joaquin River Restoration Settlement Act which calls for no third party
- 11 impacts and outlines third party protections.
- 12 • The Project must maintain senior surface water diversion rights.
- 13 • Identify a process for continued channel capacity maintenance.
- 14 • Farmers who have farmed over the original river or made levees up to it should be
- 15 made to help with restoration.
- 16 • The Mendota Pool Bypass will increase pollution.
- 17 • Several landowners do not believe the Mendota Pool Bypass is cost effective.
- 18 • Address and identify Project funding sources and assurances.
- 19 • Project should include an exit plan if funding and lawsuits halt the project.
- 20 • Evaluate the sequencing of construction events.
- 21 • The Project must address impacts of NMFS "Biological Opinions."
- 22 • Query the Natural Diversity Database and the USFWS Special Status Species
- 23 Database to identify any special-status plant or wildlife species.
- 24 • Address cumulative impacts from loss of riparian vegetation and shaded riverine
- 25 aquatic habitat and potential secondary impacts to listed runs of salmonids and
- 26 listed avian species.
- 27 • Evaluate a range of alternatives for prevention programs for terrestrial and aquatic
- 28 invasive species to slow the introduction of invasive species, such as the Quagga
- 29 mussel, into high demand and sensitive areas. The alternatives should also
- 30 consider current and proposed aquatic invasive species prevention programs.
- 31 • Examine if the project would favor non-native fisheries within the San Joaquin
- 32 River.
- 33 • Analyze how to integrate proposed flows with existing water operations and
- 34 activities.
- 35 • Evaluate agreements with all affected agencies for the operation, maintenance,
- 36 repair, replacement, and liability issues.
- 37 • Analyze additional Mendota Dam maintenance responsibility.
- 38 • Evaluate Mendota Dam structural integrity in relation to Project operations.

- 1 • Explain how flows from Mendota Dam will be curtailed to permit dam
2 maintenance.
- 3 • The Project must define actions, facility operations, agreements, permits, and
4 environmental impacts of the Mendota Pool capturing restoration flows.
- 5 • Lead agencies should cooperate with local landowners and use their inherent
6 knowledge.
- 7 • Several landowners would like to be involved with the design of channels and
8 levees.
- 9 • Several landowners would like to be involved with evaluation of land acquisitions
10 for mitigation purposes prior to final decision making.
- 11 • Several local agencies would like to review preliminary data prior to public
12 distribution in order to protect private information.
- 13 • Native American or other potential terrestrial cultural sites need to be assessed
14 within potential bypass areas (CFR Section 106).
- 15 • Evaluate the potential submerged cultural resources.
- 16 • Include cost and impact analysis of pumping, air pollution, and the project itself.
- 17 • Discuss the maximum amount of water that will be sent down the river.

18 **Restoration Program Comments**

- 19 • Include a complete Restoration Program summary and project specific
20 relationships and benefits.
- 21 • Consider opportunities to offset some of the pumping from the Delta-Mendota
22 Canal into the Mendota Pool, whether its flood flows or other, to reduce the
23 pumping load.
- 24 • Use local firms, teams, and organizations that are familiar with the cultural and
25 social landscapes.
- 26 • All communications and materials should be available in Spanish.
- 27 • Use all of the mediums that the Spanish-speaking populations use to gain
28 feedback and encourage community engagement (i.e., Radio Compenseno, Radio
29 Bilingue).
- 30 • There is a strong interest in providing work force opportunities for professional
31 and non-professional labor for Hispanics and Latinos.
- 32 • The Restoration Program should remove the existing dam and improve the
33 channel and restore the area for public access.
- 34 • Explain how the amount of proposed water will reach Reach 3.
- 35 • Identify funding for the entire Restoration Program.
- 36 • Reclamation should acknowledge delay in SJRRP implementation due to delayed
37 legislation.

- 1 • Lead agencies should return to the timeline included in the Initial Program
- 2 Alternatives Report - issuance of programmatic environmental impact analyses
- 3 addressing the Settlement prior to issuing project specific EIS/R.
- 4 • Consider temporary programs outside the Restoration Program or Settlement
- 5 Agreement that would evaluate local values and other societal benefits that could
- 6 restore Valley wildlife, groundwater, and clean surface water.

7 **Schedule Comments**

- 8 • The Final EIS/R completion date is inconsistent with the 2012 fisheries
- 9 reintroduction date.

10 **Surface Water Comments**

- 11 • Explain how the project addresses differences in elevation and water temperature
- 12 between the Mendota Pool and the river channel.
- 13 • Avoid bifurcation of future flows and rely on the Chowchilla Bypass.
- 14 • Discuss the protection of the public water supply.
- 15 • Address the city of Mendota's public water supply intake relocation.
- 16 • Discuss and evaluate the priority of amount and timing of flows.

17 **Traffic Comments**

- 18 • Must submit traffic and detour plans for construction.
- 19 • Discuss the potential changes, impacts and mitigation measures to current
- 20 transportation routes into and out of areas during the construction of project
- 21 facilities.

22 **Water Quality**

- 23 • Include a spatial and temporal analysis of water quality problems/remedies.
- 24 • Address the issues of potential degradation of water quality and quantity to
- 25 relocated river pumps.
- 26 • Consider increased turbidity and sedimentation of proposed construction activities
- 27 along water-side river banks.
- 28 • The lead agencies should coordinate with the Central Valley RWQCB for the
- 29 sharing and use of existing resources, information, data and monitoring networks.
- 30 • Evaluate existing local, State and Federal agency programs that reduce water
- 31 quality concerns and the integration of such.
- 32 • Project must be in compliance with CWA.
- 33 • Project alternatives should evaluate how to increase irrigation water quality.

34 **Wetland and Riparian Environment**

- 35 • Include wetland and riparian delineation and analysis.
- 36 • Include wetland mitigation and compensation plans.

- 1 • Discuss wetland and riparian areas considerate of water quality, habitat and
2 ecosystem.
- 3 • Maximize restoration and enhancement of functioning floodplains and riparian
4 habitat.
- 5 • Discuss the Mendota wildlife area problems of water quality, temperature and
6 current maintenance costs of existing riparian habitats.
- 7 • Evaluate all alternatives that avoid impacts to existing wetlands.
- 8 • Avoid dredging or filling waters of the United States.
- 9 • Some local landowners protest the re-introduction of salmon and the potential
10 resultant negative impacts on the existing riparian habitat, especially in the
11 Millburn Pond area.
- 12 • Protect endangered species.

13 **27.2.2 Agencies and Organizations Consulted**

14 This section discusses agency consultations and coordination that occurred during the
15 development of the EIS/R and summarizes the agency involvement activities undertaken
16 by Reclamation, CSLC, and DWR to satisfy NEPA and CEQA. Although initial CEQA
17 actions were conducted by DWR, subsequent actions during the EIS/R process have been
18 conducted by the CSLC as the State lead agency.

19 ***NEPA Cooperating Agencies***

20 Reclamation invited eligible governmental entities to participate as cooperating agencies,
21 in accordance with 43 CFR Part 46.225(3)(b), in developing the EIS/R. Several agencies
22 requested identification as cooperating agencies under NEPA, including the EPA, Corps,
23 NMFS, and Central California Irrigation District. These cooperating agencies were given
24 the opportunity to review and comment on the Administrative Draft EIS/R and provide
25 input to be considered during preparation of this Draft EIS/R.

26 Reclamation, as one of five Implementing Agencies, follows the public involvement/
27 public outreach plan, adopted in April 2007, to guide outreach. Stakeholder involvement
28 has been and continues to be facilitated through SJRRP stakeholder meetings. As defined
29 in 43 CFR Part 46.110, Reclamation is ultimately responsible for ensuring that
30 consensus-based alternatives, if any, are fully consistent with NEPA, CEQ regulations,
31 and applicable statutory and regulatory provisions.

32 ***CEQA Responsible Agencies***

33 DWR initially contacted the responsible agencies through circulation of the Notice of
34 Preparation, as required under CEQA. Comments were received from CSLC and
35 SJVAPCD.

36 ***Native American Consultation***

37 On behalf of Reclamation, Davis-King & Associates contacted the Native American
38 Heritage Commission to request a Sacred Lands File search for sacred sites within the
39 Restoration Area. The Native American Heritage Commission responded that its records

1 show an absence of sacred sites, but provided an extensive contact list of Native
2 Americans who may have information about the Restoration Area.

3 **27.2.3 Future Public Involvement**

4 In accordance with NEPA and CEQA review requirements, this EIS/R will be circulated
5 for public and agency review and comment for a 60-day period following the date when
6 the EPA publishes the Notice of Availability in the Federal Register, and the CSLC staff
7 files the Notice of Completion with the State Clearinghouse. Similar to the approach to
8 public scoping, public meetings will be held to receive public input on the Draft EIS/R.
9 These hearings will be held during the public comment period so that any comments
10 received at the hearings can be addressed in the Final EIS/R. In addition, written
11 comments from the public, reviewing agencies, and stakeholders will be accepted during
12 the public comment period.

13 The Final EIS/R will be prepared and circulated in accordance with NEPA and CEQA
14 requirements, and will include responses to comments. Reclamation will then issue its
15 Record of Decision no less than 30 days after the final EIS/R is made available. The
16 Record of Decision will identify Reclamation's decision regarding the alternatives
17 considered, and address substantive comments received on the Final EIS/R.

18 Following lead agency consideration of all comments received during the public review
19 period of the Draft EIS/R and circulation of the Final EIS/R, CSLC will hold a public
20 meeting to consider certification of the Final EIR and decide whether to approve the
21 Project. A NOD documenting the decision will be issued if the Project is approved. To
22 support a decision on the proposed action, CSLC must prepare and adopt written findings
23 of fact for each significant environmental impact identified in the Draft EIS/R, a
24 statement of overriding considerations for any significant and unavoidable impacts, if
25 needed, and a mitigation monitoring and reporting program for implementing the
26 mitigation measures and project revisions, if any, identified in the Draft EIS/R.

27 **27.3 Distribution List**

28 This section provides a list of those Federal, State, and local agencies, as well as Indian
29 Tribes, organizations, and individuals that will be notified of this EIS/R. A notice of
30 availability will also be widely distributed, indicating the document is available for
31 viewing on the SJRRP public website at www.restoresjr.net.

32 ***Federal Agencies***

- 33 • Bureau of Indian Affairs
- 34 • Bureau of Land Management - San Joaquin River Gorge
- 35 • Federal Emergency Management Agency, Region IX
- 36 • National Marine Fisheries Service
- 37 • National Park Service, Pacific West Region

San Joaquin River Restoration Program

- 1 • Natural Resources Conservation Service
- 2 • Office of Environmental Policy and Compliance, Department of the Interior
- 3 • U.S. Army Corps of Engineers
- 4 • U.S. Coast Guard
- 5 • U.S. Coast Guard, Division of Boating Safety
- 6 • U.S. Department of Agriculture, Forest Service - Sierra National Forest
- 7 • U.S. Environmental Protection Agency, Region 9, CED-2, Com. & Ecosystem
- 8 Division
- 9 • U.S. Environmental Protection Agency, WTR-3
- 10 • U.S. Fish & Wildlife Service
- 11 • U.S. Fish & Wildlife Service, Central Valley Joint Venture
- 12 • U.S. Geological Survey - California Water Science Center

13 ***United States Congress***

- 14 • U.S. Congressional Representatives, 16th District Rep. Jim Costa and 21st District
- 15 Rep. David Valadao
- 16 • U.S. Congressional Senators, Sen. Barbara Boxer and Sen. Dianne Feinstein

17 ***State Agencies***

- 18 • California Air Resources Board
- 19 • California State Transportation Agency
- 20 • California Delta Protection Commission
- 21 • California Department of Conservation
- 22 • California Department of Fish and Wildlife
- 23 • California Department of Food and Agriculture
- 24 • California Department of Forestry and Fire Protection
- 25 • California Department of Parks and Recreation
- 26 • California Department of Parks and Recreation, Division of Boating and
- 27 Waterways
- 28 • California Department of Toxic Substances Control
- 29 • California Department of Transportation
- 30 • California Department of Water Resources
- 31 • California Environmental Protection Agency
- 32 • California Highway Patrol
- 33 • California Natural Resources Agency
- 34 • California Office of Emergency Services

- 1 • California Office of Historic Preservation
- 2 • Central Valley Flood Protection Board
- 3 • Central Valley Regional Water Quality Control Board
- 4 • Native American Heritage Commission
- 5 • San Joaquin River Parkway and Conservation Trust
- 6 • San Joaquin Valley Air Pollution Control District
- 7 • State Clearinghouse
- 8 • State Water Resources Control Board
- 9 • University of California, Water Resources Center Archives

10 ***California Legislature***

- 11 • California State Assembly, 5th District Asm. Frank Bigelow and 31st District Asm.
12 Henry Perea
- 13 • California State Senate, 14th District Sen. Sen. Andy Vidak and 16th District Sen.
14 Jean Fuller

15 ***Tribes***

- 16 • Amah/Mutsun Tribal Band
- 17 • Big Sandy Rancheria of Mono Indians
- 18 • Choinumni Tribe
- 19 • Choinumni Tribe of Yokuts
- 20 • Chowchilla Tribe of Yokuts
- 21 • Cold Springs Rancheria of Mono Indians
- 22 • Dumna Tribal Government
- 23 • Dumna Wo-Wah Tribal Government
- 24 • Dunlap Band of Mono Indians
- 25 • Eshom Valley Band of Indians/Wuksachi Tribe
- 26 • Kings River Choinumni Farm Tribe
- 27 • Muwekma Ohlone Indian Tribe of the San Francisco Bay Area
- 28 • North Fork Mono Tribe
- 29 • North Valley Yokuts Tribe
- 30 • Ohlone Indian Tribe
- 31 • Picayune Rancheria of Chuckchansi Indians
- 32 • Santa Rosa Rancheria
- 33 • Sierra Nevada Native American Coalition

San Joaquin River Restoration Program

- 1 • Southern Sierra Miwuk Nation
- 2 • Table Mountain Rancheria

3 *Libraries*

- 4 • Fresno County Public Library – Firebaugh Branch Library
- 5 • Fresno County Public Library – Mendota Branch Library
- 6 • Los Banos Library
- 7 • University of California Riverside, Water Resources Center Archives

8 *Local Agencies*

- 9 • City of Firebaugh
- 10 • City of Mendota
- 11 • Fresno County Public Works and Planning Department
- 12 • Madera County Resource Management Agency

13 *County Board of Supervisors*

- 14 • Mr. Brian Pacheco, Fresno County Board of Supervisors, District 1
- 15 • Ms. Andreas Borgeas, Fresno County Board of Supervisors, District 2
- 16 • Mr. Henry Perea, Fresno County Board of Supervisors, District 3
- 17 • Ms. Buddy Mendes, Fresno County Board of Supervisors, District 4
- 18 • Ms. Debbie Poochigian, Fresno County Board of Supervisors, District 5
- 19 • Mr. Brett Frazier, Madera County Board of Supervisors, District 1
- 20 • Mr. David Rogers, Madera County Board of Supervisors, District 2
- 21 • Mr. Rick Farinelli, Madera County Board of Supervisors, District 3
- 22 • Mr. Max Rodriguez, Madera County Board of Supervisors, District 4
- 23 • Mr. Tom Wheeler, Madera County Board of Supervisors, District 5

24 *Organizations*

- 25 • Central California Irrigation District
- 26 • Chowchilla Water District
- 27 • Columbia Canal Company
- 28 • Farmers Water District
- 29 • Firebaugh Canal Water District
- 30 • Friant Water Authority
- 31 • Gill Ranch Storage

- 1 • Grassland Water District
- 2 • James Irrigation District
- 3 • Kings River Conservation District
- 4 • Kings River Water Association
- 5 • Lower San Joaquin Levee District
- 6 • Mendota Pool Group
- 7 • Mitigation Lands Trust
- 8 • Natural Resources Defense Council
- 9 • Resources Management Coalition
- 10 • River Partners
- 11 • San Joaquin River Conservancy
- 12 • San Joaquin River Exchange Contractors Water Authority
- 13 • San Joaquin Tributary Association
- 14 • San Luis & Delta-Mendota Water Authority
- 15 • The Nature Conservancy
- 16 • Tranquility Irrigation District
- 17 • Westlands Water District

18 ***Individuals***

- 19 • Barry Baker, Baker Farming
- 20 • Thomas M. Berliner, Duane Morris LLP
- 21 • Robert Brewer, Mitigation Lands Trust
- 22 • Kimberly Brown, Paramount Farming Company
- 23 • Roy Catania, Paramount Farming Company
- 24 • Shawn Coburn
- 25 • Joe Coelho, Terra Linda River Ranch
- 26 • Jason Dean, Meyers Water Bank & Wildlife Project
- 27 • Arlow Ekhard, Gill Ranch Storage
- 28 • John Foseid, Gill Ranch Storage
- 29 • Robert Frusetta
- 30 • Tom Johnson, Restoration Administrator
- 31 • Thomas Keene, Linneman, Burgess, Telles, Van Atta, Vierra, Rathmann,
32 Whitehurst & Keene
- 33 • Thomas Lopes
- 34 • Joe MacIlvaine, Paramount Farming Company

San Joaquin River Restoration Program

- 1 • Jim Merrill
- 2 • Don Peracchi, DJP Farms
- 3 • Curtis Reeve
- 4 • Jim Stillwell, Logoluso Farms
- 5 • Rob Tull, CH2M HILL
- 6 • Bill Ward, BB Limited
- 7 • Mike Widhalm, Paramount Farming Company

28.0 References

28.1 Chapter 1 – Introduction

California Department of Fish and Wildlife (DFW). 2014. *San Joaquin River Restoration Program: Salmon Conservation and Research Facility and Related Management Actions Project*. Final Environmental Impact Report. April. SCH# 2012111083.

DWR. *See* California Department of Water Resources.

Grosholz, E. and E. Gallo. 2006. *The influence of flood cycle and fish predation on invertebrate production on a restored California floodplain*. *Hydrobiologia* 568: 91-109.

Houk, pers. comm. 2009. Personal communication with Randy Houk during the Reach 2B team site visit. December 15.

Jeffres, C.A., J.J. Opperman, and P.B. Moyle. 2008. Ephemeral floodplain habitats provide best growth conditions for juvenile Chinook salmon in a California River. *Environmental Biology of Fishes*. Vol. 83, No. 4. Pages 449-458.

Reclamation. *See* U.S. Department of the Interior, Bureau of Reclamation.

San Joaquin River Restoration Program (SJRRP). 2009. *Water Year 2010 Interim Flows Project Final Environmental Assessment/Finding of No Significant Impact and Initial Study/Mitigated Negative Declaration*. September.

San Joaquin River Restoration Program (SJRRP). 2010a. *Fisheries Management Plan: A Framework for Adaptive Management in the San Joaquin River Restoration Program*. November.

San Joaquin River Restoration Program (SJRRP). 2010b. *Mendota Pool Bypass and Reach 2B Improvements Project Public Scoping Report*. February.

San Joaquin River Restoration Program (SJRRP). 2010c. *Interim Flows Project – Water Year 2011 Supplemental Environmental Assessment/Finding of No Significant Impact*. September.

San Joaquin River Restoration Program (SJRRP). 2011a. *Draft Program Environmental Impact Statement/Report*. April. SCH # 2007081125.

San Joaquin River Restoration Program (SJRRP). 2011b. *Interim Flows Project – Water Year 2012 Final Supplemental Environmental Assessment/Finding of No Significant Impact*. September.

San Joaquin River Restoration Program

- 1 San Joaquin River Restoration Program (SJRRP). 2011c. *Mendota Dam Sluice Gates*
2 *Replacement Project, Final Environmental Assessment/Finding of No Significant*
3 *Impact*. December.
- 4 San Joaquin River Restoration Program (SJRRP). 2012a. *Minimum Floodplain Habitat*
5 *Area for Spring and Fall-Run Chinook Salmon*. November.
- 6 San Joaquin River Restoration Program (SJRRP). 2012b. Attachment A – Initial
7 Alternatives Evaluation, in *Mendota Pool Bypass and Reach 2B Improvements*
8 *Project, Project Description Technical Memorandum*. October.
- 9 San Joaquin River Restoration Program (SJRRP). 2012c. *Final Program Environmental*
10 *Impact Statement/Report*. SJRRP. July.
- 11 San Joaquin River Restoration Program (SJRRP). 2012d. *Invasive Vegetation Monitoring*
12 *and Management Final Environmental Assessment/Finding of No Significant*
13 *Impact*. SJRRP. October 2012.
- 14 San Joaquin River Restoration Program (SJRRP). 2012e. *San Joaquin River Restoration*
15 *Program Record of Decision*. September 28.
- 16 San Joaquin River Restoration Program (SJRRP). 2013. *Restoration Flow Guidelines*.
17 December.
- 18 San Joaquin River Restoration Program (SJRRP). 2015. *Draft 2015 Revised Framework*
19 *for Implementation*. May.
- 20 Sommer, T.R., M.L. Nobriga, W.C. Harrell, W. Batham, and W.J. Kimmerer. 2001.
21 *Floodplain rearing of juvenile Chinook salmon: evidence of enhanced growth and*
22 *survival*. Canadian Journal of Fisheries and Aquatic Sciences. Volume 58. Pages
23 325–333.
- 24 Sommer, T.R., W.C. Harrell, A.M. Solger, B. Tom, and W. Kimmerer. 2004. *Effects of*
25 *flow variation on channel and floodplain biota and habitats of the Sacramento*
26 *River, California, USA*. Aquatic Conservation-Marine and Freshwater
27 Ecosystems. Volume 14. Pages 247–261.
- 28 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2011.
29 *Recirculation of Recaptured Water Year 2011 San Joaquin River Restoration*
30 *Program Interim Flows Environmental Assessment/Finding of No Significant*
31 *Impact*. May.
- 32 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2014. *2014 San*
33 *Joaquin River Restoration Program Juvenile Fall-Run Chinook Salmon Trap and*
34 *Haul Study Environmental Assessment/Finding of No Significant Impact*.
35 February.

1 **28.2 Chapter 2 – Description of Alternatives**

- 2 Ahlborn, G. 1999. Fresno Kangaroo Rat (*Dipodomys nitratooides*). California Wildlife
3 Habitat Relationships System, California Department of Fish and Wildlife,
4 California Interagency Wildlife Task Group. September.
- 5 Ahlborn, G. 2000. Kit Fox (*Vulpes macrotis*). California Wildlife Habitat Relationships
6 System, California Department of Fish and Wildlife, California Interagency
7 Wildlife Task Group. May.
- 8 Bombay, H.L., T.M. Benson, B.E. Valentine, and R.A. Stefani. 2003. *A Willow*
9 *Flycatcher Survey Protocol for California*. May 29.
- 10 CalFish. 2014. Passage Assessment Database. <www.calfish.org>. Last accessed April
11 2015.
- 12 California Burrowing Owl Consortium. 1993. *Burrowing Owl Survey Protocol and*
13 *Mitigation Guidelines*. April.
- 14 California Department of Finance (CDF). 2014. *Report P-1 (Total Population): State and*
15 *County Population Projections, 2010-2060*. Sacramento. December.
- 16 California Department of Fish and Wildlife (DFW). 2010. *Bald Eagle Breeding Survey*
17 *Instructions*. April.
- 18 California Department of Fish and Wildlife (DFW). 2012. *Staff Report on Burrowing*
19 *Owl Mitigation*. March 7.
- 20 Central Valley Floodplain Evaluation and Delineation (CVFED) and San Joaquin River
21 Restoration Program (SJRRP). 2009. LiDAR data and aerial imagery. Produced
22 for California Department of Water Resources. April 9.
- 23 DFW. *See* California Department of Fish and Wildlife.
- 24 Halterman, M., M.J. Johnson, and J.A. Holmes. 2009. *Western Yellow-billed Cuckoo*
25 *Natural History Summary and Survey Methodology*. Version 3.4. May.
- 26 National Marine Fisheries Service (NMFS). 2001. *Guidelines for Salmonid Passage at*
27 *Stream Crossings*. Southwest Region. September.
- 28 National Marine Fisheries Service (NMFS). 2008. *Anadromous Salmonid Passage*
29 *Facility Design*. Northwest Region. February.
- 30 San Joaquin River Restoration Program (SJRRP). 2010a. *Mendota Pool Bypass and*
31 *Reach 2B Improvements Project Initial Options Technical Memorandum*. April.
- 32 San Joaquin River Restoration Program (SJRRP). 2010b. *Mendota Pool Bypass and*
33 *Reach 2B Improvements Project Public Scoping Report*. February.

San Joaquin River Restoration Program

- 1 San Joaquin River Restoration Program (SJRRP). 2010c. *Mendota Pool Bypass and*
2 *Reach 2B Improvements Project Technical Memorandum on Selection and Use of*
3 *Analytical Tools*. October.
- 4 San Joaquin River Restoration Program (SJRRP). 2010d. *Water Year 2011 Interim Flows*
5 *Project Supplemental Environmental Assessment and Finding of No Significant*
6 *Impact*. September.
- 7 San Joaquin River Restoration Program (SJRRP). 2011a. *Draft San Joaquin River*
8 *Restoration Program, Program Environmental Impact Statement/Report*. April.
9 SCH # 2007081125.
- 10 San Joaquin River Restoration Program (SJRRP). 2011b. *Mendota Pool Bypass and*
11 *Reach 2B Improvements Project Technical Memorandum on Regulatory*
12 *Compliance*. July.
- 13 San Joaquin River Restoration Program (SJRRP). 2012. Attachment A – Initial
14 Alternatives Evaluation, in *Mendota Pool Bypass and Reach 2B Improvements*
15 *Project, Project Description Technical Memorandum*. October.
- 16 San Joaquin River Restoration Program (SJRRP). 2015. *Channel Capacity Report, 2015*
17 *Restoration Year*. Technical Memorandum. January.
- 18 Sommer, T.R., M.L. Nobriga, W.C. Harrell, W. Batham, and W.J. Kimmerer. 2001.
19 *Floodplain rearing of juvenile Chinook salmon: evidence of enhanced growth and*
20 *survival*. Canadian Journal of Fisheries and Aquatic Sciences. Volume 58. Pages
21 325–333.
- 22 Swainson's Hawk Technical Advisory Committee. 2000. *Recommended Timing and*
23 *Methodology for Swainson's Hawk Nesting Surveys in California's Central*
24 *Valley*. May 31.
- 25 Tetra Tech. 2011. *Fresno Slough Dam Alternative - Elimination of Mendota Dam Option*.
26 September 22.
- 27 Tetra Tech. 2012. *Reach 2B Floodplain Alternatives Supplemental Analysis*. January 9.
- 28 U.S. Army Corps of Engineers (Corps). 2000a. *Engineer Manual 1110-2-1913, Design*
29 *and Construction of Levees*. April 30.
- 30 U.S. Army Corps of Engineers (Corps). 2000b. *Engineer Manual 1110-2-301, Guidelines*
31 *for Landscape Planting and Vegetation Management at Floodwalls, Levees, &*
32 *Embankment Dams*. January 1.
- 33 U.S. Army Corps of Engineers (Corps). 2003. *Engineer Manual 1110-2-1902, Slope*
34 *Stability*. October 31.

- 1 U.S. Army Corps of Engineers (Corps). 2005. *Engineering Technical Letter No. 1110-2-*
2 *569, Design Guidance for Levee Underseepage*. May 1.
- 3 U.S. Army Corps of Engineers (Corps), Environmental Laboratory. 1987. Corps of
4 Engineers Wetlands Delineation Manual. Final Report. January.
- 5 U.S. Army Corps of Engineers (Corps), Environmental Laboratory. 2008. Regional
6 Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West
7 Region (Version 2.0). September.
- 8 U.S. Fish and Wildlife Service (USFWS). 1993. 50 CFR Part 17 (Final Rule).
9 Endangered and Threatened Wildlife and Plants; Determination of Threatened
10 Status for the Giant Garter Snake. October 20.
- 11 U.S. Fish and Wildlife Service (USFWS). 1997. Appendix A, Guidelines for Restoration
12 and/or Replacement of Giant Garter Snake Habitat, in *Programmatic*
13 *Consultation with the U.S. Army Corps of Engineers 404 Permitted Projects with*
14 *Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn,*
15 *Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo*
16 *Counties, California*. Sacramento Fish and Wildlife Office, Sacramento,
17 California.
- 18 U.S. Fish and Wildlife Service (USFWS). 1998. *Recovery Plan for Upland Species of the*
19 *San Joaquin Valley, California*. Portland, Oregon.
- 20 U.S. Fish and Wildlife Service (USFWS). 1999a. *Conservation Guidelines for the Valley*
21 *Elderberry Longhorn Beetle*. Sacramento Fish and Wildlife Office, Sacramento,
22 California. July 9.
- 23 U.S. Fish and Wildlife Service (USFWS). 1999b. *U.S. Fish and Wildlife Service*
24 *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior*
25 *to or During Ground Disturbance*. Sacramento Fish and Wildlife Office. June.
- 26 U.S. Fish and Wildlife Service (USFWS). 2001. *Least Bell's Vireo Survey Guidelines*.
27 January 19.
- 28 U.S. Fish and Wildlife Service (USFWS). 2004. *Protocol for Evaluating Bald Eagle*
29 *Habitat and Populations in California*. Prepared by Garcia and Associates and
30 Pacific Gas and Electric Company. June.
- 31 U.S. Fish and Wildlife Service (USFWS). 2005. *Recovery Plan for Vernal Pool Species*
32 *of California and Southern Oregon*. Portland, Oregon.
- 33 U.S. Fish and Wildlife Service (USFWS). 2010. *Best Management Practices to Minimize*
34 *Adverse Effects to Pacific Lamprey (Entosphenus tridentatus)*. April.

1 **28.3 Chapter 3 – Considerations for Describing the**
2 **Affected Environment and Environmental**
3 **Consequences**

4 No references.

5 **28.4 Chapter 4 – Air Quality**

6 ARB. *See* California Air Resources Board.

7 California Air Resources Board (ARB). 2005. *Air Quality and Land Use Handbook: A*
8 *Community Health Perspective*. Sacramento, CA. April.

9 California Air Resources Board (ARB). 2007a. *The California Almanac of Emissions and*
10 *Air Quality*, 2006 Edition. Sacramento, CA.

11 California Air Resources Board (ARB). 2007b. EMFAC2007 software. Available:
12 <<http://www.arb.ca.gov/msei/documentation.htm>>. Last accessed January 2015.

13 California Air Resources Board (ARB). 2008. Air Resources Board Item Summary, Items
14 # 07-9-1 to 07-09-5. September 27, 2007.

15 California Air Resources Board (ARB). 2011a. *Ambient Air Quality Standards*. June 17.

16 California Air Resources Board (ARB). 2011b. Area Designation Maps / State and
17 National. Available: <www.arb.ca.gov/desig/adm/adm.htm>. Last accessed
18 March 2013.

19 California Air Resources Board (ARB). 2011c. Community Health Air Pollution
20 Information System. Available:
21 <http://www.arb.ca.gov/gismo2/chapis_v01_6_1_04/>. Last accessed May 2015.

22 California Air Resources Board (ARB). 2011d. State Implementation Plan. Available:
23 <<http://www.arb.ca.gov/planning/sip/sip.htm>>. Last accessed March 2013.

24 California Air Resources Board (ARB). 2011e. In-Use Off-Road 2011 Inventory Model.
25 Available: <http://www.arb.ca.gov/msei/categories.htm#inuse_or_category>. Last
26 accessed January 2015.

27 California Air Resources Board (ARB). 2013a. Emissions Inventory for San Joaquin
28 Valley Air Basin and Fresno, Madera, Merced counties. Available:
29 <<http://www.arb.ca.gov/app/emsmv/2013/emssumcat.php>>. Published 2013.
30 Accessed May 2015.

31 California Air Resources Board (ARB). 2013b. Air Quality Data Statistics. Available:
32 <www.arb.ca.gov/adam/welcome.html>. Accessed May 2015.

- 1 California Air Resources Board (ARB). 2014. *The California Almanac of Emissions and*
 2 *Air Quality - 2013 Edition*. Air Quality Planning and Science Division. February
 3 8.
- 4 City of Fresno. 2009. *Air Quality Update of the 2025 Fresno General Plan Resource*
 5 *Conservation Element*. Draft. May 7.
- 6 City of Mendota. 2009. *City of Mendota General Plan Update 2005-2025*. Adopted
 7 August 11.
- 8 EPA. See U.S. Environmental Protection Agency.
- 9 Fresno County. 2000. “Open Space and Conservation Element” in *Fresno County*
 10 *General Plan Policy Document – General Plan Update*. October 3.
- 11 Madera County. 2010. *Air Quality Element*. Madera County General Plan Planning
 12 Department.
- 13 Office of Environmental Health Hazard Assessment (OEHHA). 2003. *Air Toxics Hot*
 14 *Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program*
 15 *Guidance Manual for Preparation of Health Risk Assessments*. August.
- 16 Office of Environmental Health Hazard Assessment (OEHHA). 2012. *Air Toxics Hot*
 17 *Spots Program Risk Assessment Guidelines, Technical Support Document for*
 18 *Exposure Assessment and Stochastic Analysis*. August.
- 19 Sacramento Metropolitan Air Quality Management District. 2012. Road Construction
 20 Emissions Model, RoadMod, Version 7.1.2. Available:
 21 <<http://www.airquality.org/ceqa/RoadConstructionModelVer7-1-2.xls>>.
 22 September.
- 23 San Joaquin Valley Air Pollution Control District (SJVAPCD). 2002. *Guide for*
 24 *Assessing and Mitigating Air Quality Impacts*. January 10.
- 25 San Joaquin Valley Air Pollution Control District (SJVAPCD). 2005. *Extreme Ozone*
 26 *Attainment Demonstration Plan, San Joaquin Valley Air Basin Plan*
 27 *Demonstrating Attainment of Federal 1-hour Ozone Standards*. Revised October
 28 20.
- 29 San Joaquin Valley Air Pollution Control District (SJVAPCD). 2006. *Draft Guidance for*
 30 *Air Dispersion Modeling*. August.
- 31 San Joaquin Valley Air Pollution Control District (SJVAPCD). 2011. Ambient Air
 32 Quality Standards & Valley Attainment Status. Available:
 33 <<http://www.valleyair.org/aqinfo/attainment.htm>>. Last accessed January 2015.
- 34 San Joaquin Valley Air Pollution Control District (SJVAPCD). 2012. *Draft Guidance for*
 35 *Assessing and Mitigating Air Quality Impacts - 2012*. May.

- 1 San Joaquin Valley Air Pollution Control District (SJVAPCD). 2013. *2013 Plan for the*
2 *Revoked 1-Hour Ozone Standard*. September 19.
- 3 San Joaquin Valley Air Pollution Control District (SJVAPCD). 2014. *Draft Guidance for*
4 *Assessing and Mitigating Air Quality Impacts*. July 7.
- 5 U.S. Environmental Protection Agency (EPA). 1998. Western Surface Coal Mining, in
6 *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and*
7 *Area Sources*. AP-42, Fifth Edition, Chapter 11.9. Final Section. October.
- 8 U.S. Environmental Protection Agency (EPA). 2006. Unpaved Roads, in *Compilation of*
9 *Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*.
10 AP-42, Fifth Edition, Chapter 13.2.2. Final Section. November.
- 11 U.S. Environmental Protection Agency (EPA). 2011a. Paved Roads, in *Compilation of*
12 *Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*.
13 AP-42, Fifth Edition, Chapter 13.2.1. Final Section. January.
- 14 U.S. Environmental Protection Agency (EPA). 2011b. De Minimis Levels. Available:
15 <www.epa.gov/oar/genconform/deminimis.html>. Accessed January 2015.
- 16 U.S. Environmental Protection Agency (EPA). 2013a. Carbon Monoxide. Available:
17 <[http://www.epa.gov/cgi-](http://www.epa.gov/cgi-bin/broker?_service=data&_debug=0&_program=dataprog.national_1.sas&polchoice=CO)
18 [bin/broker?_service=data&_debug=0&_program=dataprog.national_1.sas&polch](http://www.epa.gov/cgi-bin/broker?_service=data&_debug=0&_program=dataprog.national_1.sas&polchoice=CO)
19 [oice=CO](http://www.epa.gov/cgi-bin/broker?_service=data&_debug=0&_program=dataprog.national_1.sas&polchoice=CO)>. Accessed May 2013.
- 20 U.S. Environmental Protection Agency (EPA). 2013b. *Blood Lead*. Report on the
21 Environment. August.
- 22 U.S. Environmental Protection Agency (EPA). 2013c. Air Data. Available:
23 <<http://www.epa.gov/air/data/>>. Accessed May 2015.
- 24 U.S. Environmental Protection Agency (EPA). 2013d. The Greenbook Nonattainment
25 Areas for Criteria Pollutants. Available:
26 <<http://www.epa.gov/air/oaqps/greenbk/index.html>>. Accessed May 2015.
- 27 U.S. Environmental Protection Agency (EPA). 2014. Criteria Air Pollutant Information.
28 Available: <<http://www.epa.gov/air/urbanair/>>. Accessed January 2015.
- 29 Villalvazo, pers. comm., 2014. Personal communication with Leland Villalvazo,
30 Supervising Air Quality Specialist, SJVAPCD. February 26, 2014.

31 **28.5 Chapter 5 – Biological Resources – Fisheries**

- 32 Ahearn, D.S., J.H. Viers, J.F. Mount, and R.A. Dahlgren. 2006. *Priming the productivity*
33 *pump: flood pulse driven trends in suspended algal biomass distribution across a*
34 *restored floodplain*. *Freshwater Biology* 51, 1417-1433. August.

- 1 Brown, L.R. 1996. *Aquatic Biology of the San Joaquin-Tulare Basins, California:*
 2 *Analysis of Available Data through 1992.* U.S. Geological Survey Water-Supply
 3 Paper No. 2471. Denver, Colorado.
- 4 California Department of Fish and Wildlife (DFW). 1998. A Status Review of the Spring
 5 Run Chinook Salmon (*Oncorhynchus tshawytscha*) in the Sacramento River
 6 Drainage. Report to the Fish and Game Commission. Candidate Species Status
 7 Report 98-01. June.
- 8 California Department of Fish and Wildlife (DFW). 2010. San Joaquin River Meso-
 9 Habitat Monitoring Pilot Study Habitat Mapping Data. Provided by Eric Guzman,
 10 California Department of Fish and Game, San Joaquin River Restoration Fisheries
 11 Management Work Group.
- 12 California Department of Fish and Wildlife (DFW). 2012. *2011 Sturgeon Fishing Report*
 13 *Card: Preliminary Data Report.* J. DuBois, T. MacColl and E. Haydt, Calif. Dept.
 14 Fish and Game, BayDelta Region. March 23.
- 15 California Department of Fish and Wildlife (DFW). 2015. *Species List for the Mendota*
 16 *Dam, Jamesan, Tranquility, Coit Ranch, Firebaugh, Poso Farm, Firebaugh NE,*
 17 *Bonita Ranch, and Gravelly Ford quadrangles.* California Natural Diversity
 18 Database. February 20.
- 19 DFW. *See* California Department of Fish and Wildlife.
- 20 Eacock, pers. comm., 2011. Email correspondence between Michael E. A. (Chris)
 21 Eacock, U.S. Bureau of Reclamation and Katie Simpson, Senior Staff Biologist,
 22 Cardno ENTRIX, February 15, 16 and 17, 2011.
- 23 Eilers, C.D., J. Bergman, and R. Nelson. 2010. *A Comprehensive Monitoring Plan for*
 24 *Steelhead in the California Central Valley.* Fisheries Branch, Department of Fish
 25 and Game. Administrative Report Number: 2010-2. October.
- 26 Grosholz, E., and E. Gallo. 2006. *The influence of flood cycle and fish predation on*
 27 *invertebrate production on a restored California floodplain.* Hydrobiologia 568:
 28 91-109.
- 29 Guzman, pers. comm., 2011. Phone conversation between Eric Guzman, Associate
 30 Biologist, Region 4, Department of Fish and Game and Tom Taylor, Senior
 31 Consultant, Cardno ENTRIX, February 17, 2011.
- 32 Hutcherson, J. 2013. Unpublished data provided by Jarod Hutcherson, Fisheries
 33 Biologist, U.S. Department of the Interior, Bureau of Reclamation.
- 34 Jackson, Z.J. and J.P. Van Eenennaam. 2013. *2012 San Joaquin River Sturgeon*
 35 *Spawning Survey.* Final Annual Report. March.

San Joaquin River Restoration Program

- 1 Jeffers, C.A., J.J. Opperman, and P.B. Moyle. 2008. *Ephemeral floodplain habitats*
2 *provide best growth conditions for juvenile Chinook salmon in a California river.*
3 Environmental Biology of Fishes. December.
- 4 Jones and Stokes. 1986. *White Bass Sampling Program*. Final Report. Prepared by Jones
5 and Stokes, Sacramento, CA for the California Department of Fish and Game,
6 Rancho Cordova, CA. October.
- 7 Maslin, P.E., M. Lenox, J. Kindopp, and W.R. McKinny. 1997. *Intermittent Streams as*
8 *Rearing Habitat for Sacramento River Chinook Salmon*. California State
9 University, Chico, Department of Biological Sciences.
- 10 McBain and Trush, Inc. (eds.). 2002. *San Joaquin River Restoration Study Background*
11 *Report*. Prepared for Friant Water Users Authority, Lindsay California, and
12 Natural Resources Defense Council, San Francisco, California. December.
- 13 Moyle, P.B. 2002. *Inland Fishes of California*. University of California Press, Berkeley
14 and Los Angeles, California.
- 15 National Marine Fisheries Service (NMFS). 2001. *Guidelines for Salmonid Passage at*
16 *Stream Crossings*. Southwest Region. September.
- 17 National Marine Fisheries Service (NMFS). 2005. *Endangered and Threatened Species;*
18 *Designation of Critical Habitat for Seven Evolutionarily Significant Units of*
19 *Pacific Salmon and Steelhead in California*. Federal Register 70: 524888-52627.
- 20 National Marine Fisheries Service (NMFS). 2008. *Anadromous Salmonid Passage*
21 *Facility Design*. Northwest Region. Portland, Oregon. February.
- 22 Nelson, J.S., E.J. Grossman, H. Espinosa-Perez, L.T. Findley, C.R. Gilbert, R.N. Lea, and
23 J.D. Williams. 2004. *Common and Scientific Names of Fishes from the United*
24 *States, Canada, and Mexico*. American Fisheries Society, Special Publication 29,
25 Bethesda, Maryland. July.
- 26 NMFS. *See* National Marine Fisheries Service.
- 27 Pacific Fishery Management Council (PFMC). 2012. Pacific Coast Salmon Fishery
28 Management Plan for Commercial and Recreational Salmon Fisheries off the
29 Coasts of Washington, Oregon, and California as Revised through Amendment
30 17. Portland, OR. October.
- 31 Portz, D.E., E. Best, and C. Svoboda. 2011. *Evaluation of Hills Ferry Barrier*
32 *Effectiveness at Restricting Chinook Salmon Passage on the San Joaquin River*.
33 Bureau of Reclamation Technical Service Center. October.
- 34 San Francisco Estuary Institute (SFEI). 2002. *Grasslands Bypass Project, Annual Report*
35 *2000-2001*. Report prepared by the San Francisco Estuary Institute for the
36 Grassland Bypass Project Oversight Committee, 157 pp.

- 1 San Joaquin River Restoration Program (SJRRP). 2010a. *Mendota Pool Bypass and*
 2 *Reach 2B Improvements Project Draft Technical Memorandum on Existing*
 3 *Environmental Conditions: Data Needs and Survey Approach*. March.
- 4 San Joaquin River Restoration Program (SJRRP). 2010b. *Mendota Pool Bypass and*
 5 *Reach 2B Improvements Project Initial Options Technical Memorandum*. April.
- 6 San Joaquin River Restoration Program (SJRRP). 2010c. *Fisheries Management Plan: A*
 7 *Framework for Adaptive Management in the San Joaquin River Restoration*
 8 *Program*. November.
- 9 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
 10 *Restoration Program, Program Environmental Impact Statement/Report*. April.
 11 SCH # 2007081125.
- 12 San Joaquin River Restoration Program (SJRRP). 2014. *Field Activity Advisory: Invasive*
 13 *Species Sampling*. November 3, 2014.
- 14 Sommer, T.R., M.L. Nobriga, W.C. Harrell, W. Batham, and W.J. Kimmerer. 2001.
 15 *Floodplain rearing of juvenile Chinook salmon: evidence of enhanced growth and*
 16 *survival*. Canadian Journal of Fisheries and Aquatic Sciences 58: 325–333.
 17 January.
- 18 Stillwater Sciences. 2003. *Draft Restoration Strategies for the San Joaquin River*.
 19 Prepared for Natural Resources Defense Council, San Francisco, California and
 20 Friant Water Users Authority, Lindsay, California. February.
- 21 United States Fish and Wildlife Service (USFWS). 1994. *Endangered and Threatened*
 22 *Wildlife and Plants; Critical Habitat Determination for the Delta Smelt*. Federal
 23 Register 59: 65256-65279.
- 24 United States Fish and Wildlife Service (USFWS). 2014. “Field Notes Entry. Stockton
 25 FWO: “Shocking” Discovery on the San Joaquin River.” December 1, 2014.
 26 Available:
 27 <http://www.fws.gov/FieldNotes/regmap.cfm?framesFlag=0&arskey=35640&callingKey=executive_summary&callingValue=loach>. Last accessed May 2015.
 28
- 29 United States Fish and Wildlife Service (USFWS). 2015. *Species List for the Mendota*
 30 *Dam, Jamesan, Tranquility, Coit Ranch, Firebaugh, Poso Farm, Firebaugh NE,*
 31 *Bonita Ranch, and Gravelly Ford quadrangles* (Consultation Code: 08ESMF00-
 32 2015-SLI-0364, Event Code: 08ESMF00-2015-E-01764).
- 33 West Coast Chinook Salmon Biological Review Team (WCCSBRT). 1997. Review of
 34 the Status of Chinook salmon (*Oncorhynchus tshawytscha*) from Washington,
 35 Oregon, California, and Idaho under the U.S. Endangered Species Act. December
 36 17.

1 Wikert, pers. comm., 2011. Phone conversation between J.D. Wickert, Fishery Biologist,
2 Anadromous Fish Restoration Program, Stockton Office, US Fish and Wildlife
3 Service and Tom Taylor, Senior Consultant, Cardno ENTRIX, February 25, 2011.

4 Workman, M., and D.E. Portz. 2013. *Fish Assemblage Inventory and Monitoring*. San
5 Joaquin River Restoration Program. August.

6 **28.6 Chapter 6 – Biological Resources – Vegetation**

7 The Bay Institute. 1998. *From the Sierra to the Sea, The Ecological History of the San*
8 *Francisco Bay-Delta Watershed*. July.

9 Bossard, C.C., J.M. Randall, and M.C. Hoshovsky. 2000. *Invasive Plants of California's*
10 *Wildlands*. University of California Press: Berkley and Los Angeles, California.

11 California Department of Fish and Wildlife (DFW). 2003. *List of California Terrestrial*
12 *Natural Communities Recognized by the California Natural Diversity Database*.
13 The Vegetation Classification and Mapping Program. Department of Fish and
14 Game, Biogeographic Data Branch. September.

15 California Department of Fish and Wildlife (DFW). 2009. *List of California Vegetation*
16 *Alliances*. Vegetation Classification and Mapping Program. Department of Fish
17 and Game, Biogeographic Data Branch. December 28.

18 California Department of Fish and Wildlife (DFW). 2015. *Special Vascular Plants,*
19 *Bryophytes, and Lichens List*. Natural Heritage Division, Natural Diversity Data
20 Base. January. Available: <[http://www.dfg.ca.gov/biogeodata/cnddb/
21 plants_and_animals.asp](http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp)>. Accessed March 2015.

22 California Department of Food and Agriculture (CDFA). 2012. Weed Ratings. Available:
23 <http://www.cdfa.ca.gov/plant/ipc/encycloweedia/winfo_weedratings.html>. Last
24 accessed April 2015.

25 California Department of Water Resources (DWR). 2002. *Riparian Vegetation of the San*
26 *Joaquin River*. Technical Information Record SJD-02-1. Prepared for San Joaquin
27 River Riparian Habitat Restoration Program, U.S. Bureau of Reclamation. May.

28 Coops, H., F.W.B. van den Brink, and G. van der Velde. 1996. *Growth and*
29 *Morphological Responses of Four Helopyhte Species in an Experimental Water-*
30 *Depth Gradient*. Aquatic Botany 54:11–24.

31 Davis, M.A., and K. Thompson. 2000. *Eight Ways to Be a Colonizer; Two Ways to Be an*
32 *Invader: A Proposed Nomenclature Scheme for Invasion Ecology*. Bulletin of the
33 Ecological Society of America 81:226–230.

34 DFW. See California Department of Fish and Wildlife.

- 1 DWR. *See* California Department of Water Resources.
- 2 Friedman, J.M., and G.T. Auble. 1999. *Mortality of Riparian Box Elder from Sediment*
3 *Mobilization and Extended Inundation*. Regulated Rivers: Research &
4 Management 15:463–476.
- 5 Grace, J.B., and J.S. Harrison. 1986. The Biology of Canadian Weeds. 73. *Typha latifolia*
6 *L.*, *Typha angustifolia L.* and *Typha xglauca Godr.* Canadian Journal of Plant
7 Science 66:361–379.
- 8 Hickson, pers. comm. 2009. Telephone conversation between Diana Hickson, Senior
9 Vegetation Ecologist, DFW, and George Strnad, Project Plant Ecologist, URS.
10 December 10.
- 11 Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of*
12 *California*. California Department of Fish and Game, Nongame-Heritage
13 Program. Sacramento, California. October.
- 14 Hunter, J.C., and G.A.J. Platenkamp. 2003. *The Hunt for Red Sesbania: Biology, Spread,*
15 *and Prospects for Control*. Cal EPPC News (11): 4–6.
- 16 Karrenberg, S., P.J. Edwards, and J. Kollmann. 2002. *The Life History of Salicaceae*
17 *Living in Active Floodplains*. Freshwater Biology (47): 733–748.
- 18 McBain and Trush, Inc. (eds.). 2002. *San Joaquin River Restoration Study Background*
19 *Report*. Prepared for Friant Water Users Authority, Lindsay California, and
20 Natural Resources Defense Council, San Francisco, California. December.
- 21 NatureServe Explorer 2009. NatureServe Conservation Status. Available:
22 <<http://explorer.natureserve.org/ranking.htm>>. Accessed October 2011.
- 23 Reclamation. *See* U.S. Department of the Interior, Bureau of Reclamation.
- 24 Riparian Habitat Joint Venture (RHJV). 2004. *The Riparian Bird Conservation Plan,*
25 *A strategy for reversing the decline of riparian associated birds in California.*
26 California Partners in Flight. Version 2.0
- 27 San Joaquin River Restoration Program (SJRRP). 2011a. *Mendota Pool Bypass and*
28 *Reach 2B Improvements Project Technical Memorandum on Environmental Field*
29 *Survey Results*. November.
- 30 San Joaquin River Restoration Program (SJRRP). 2011b. *Draft San Joaquin River*
31 *Restoration Program, Program Environmental Impact Statement/Report*. April.
32 SCH # 2007081125.
- 33 San Joaquin River Restoration Program (SJRRP). 2012. Attachment A – Initial
34 Alternatives Evaluation, in *Mendota Pool Bypass and Reach 2B Improvements*
35 *Project, Project Description Technical Memorandum*. October.

- 1 U.S. Army Corps of Engineers (Corps). 2000. Final Functional Relationships for the
2 Ecosystems Functions Model. Prepared by Jones & Stokes. Sacramento, CA.
3 December.
- 4 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 1998a. *Historical*
5 *Riparian Habitat Conditions of the San Joaquin River — Friant Dam to the*
6 *Merced River*, prepared by Jones & Stokes Associates, Inc. Fresno, California.
7 April.
- 8 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 1998b. *Analysis*
9 *of Physical Processes and Riparian Habitat Potential of the San Joaquin River —*
10 *Friant Dam to the Merced River*, prepared by Jones & Stokes Associates, Inc.
11 Fresno, California. October.
- 12 U.S. Fish and Wildlife Service (USFWS). 1998. *Recovery Plan for Upland Species of the*
13 *San Joaquin Valley, California*. Portland, Oregon.

14 **28.7 Chapter 7 – Biological Resources – Wildlife**

- 15 Audubon Society. 2009. Species list for the Mendota Wildlife Area obtained via email by
16 Rebecca Verity, URS Corporation, from Andrea Jones, Audubon Society.
17 November 16.
- 18 The Bay Institute. 1998. *From the Sierra to the Sea: The Ecological History of the San*
19 *Francisco Bay-Delta Watershed*. July.
- 20 California Department of Fish and Wildlife (DFW). 2009. *Species List for the Mendota*
21 *Dam, Jamesan, Tranquility, Coit Ranch, Firebaugh, Poso Farm, Firebaugh NE,*
22 *Bonita Ranch, and Gravelly Ford quadrangles*. Rarefind 3, a program created by
23 DFW allowing access to the California Natural Diversity Database. October.
- 24 California Department of Fish and Wildlife (DFW). 2011. *Special Animals (List)*.
25 Biogeographic Data Branch: California Natural Diversity Database. January.
26 Available: <<http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPANimals.pdf>>.
27 Accessed October 2011.
- 28 California Wildlife Habitat Relationships System (WHR). 2010. Wildlife Habitats —
29 California Wildlife Habitat Relationships System. June. Available: <[https://](https://www.dfg.ca.gov/biogeodata/cwhr/wildlife_habitats.asp)
30 www.dfg.ca.gov/biogeodata/cwhr/wildlife_habitats.asp>. Last accessed April
31 2015.
- 32 Central Valley Joint Venture. 2006. *Central Valley Joint Venture Implementation Plan —*
33 *Conserving Bird Habitat*. U.S. Fish and Wildlife Service, Sacramento, CA.
- 34 DFW. *See* California Department of Fish and Wildlife.

- 1 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
2 *Update*. October 3.
- 3 Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of*
4 *California*. California Department of Fish and Wildlife, Nongame-Heritage
5 Program. Sacramento, California. October.
- 6 Madera County. 1995. *Madera County General Plan Policy Document*. October 24.
- 7 McBain and Trush, Inc. (eds.). 2002. *San Joaquin River Restoration Study Background*
8 *Report*. Prepared for Friant Water Users Authority, Lindsay California, and
9 Natural Resources Defense Council, San Francisco, California. December.
- 10 Moise, G.W. and B. Hendrickson. 2002. *Riparian Vegetation of the San Joaquin River*.
11 Technical Information Record SJD-02-1. Department of Water Resources,
12 Fresno, California. May.
- 13 Rabbe, pers. comm. 2015. Email communication between Andrew Rabbe, U.S. Fish and
14 Wildlife Service, and Katrina Harrison, U.S. Bureau of Reclamation. May 11.
- 15 San Joaquin River Restoration Program (SJRRP). 2011a. *Mendota Pool Bypass and*
16 *Reach 2B Improvements Project Technical Memorandum on Environmental Field*
17 *Survey Results*. November.
- 18 San Joaquin River Restoration Program (SJRRP). 2011b. *Draft San Joaquin River*
19 *Restoration Program, Program Environmental Impact Statement/Report*. April.
- 20 San Joaquin River Restoration Program (SJRRP). 2012. Attachment A – Initial
21 Alternatives Evaluation, in *Mendota Pool Bypass and Reach 2B Improvements*
22 *Project, Project Description Technical Memorandum*. October.
- 23 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 1998. *Historical*
24 *Riparian Habitat Conditions of the San Joaquin River – Friant Dam to the*
25 *Merced River*, prepared by Jones & Stokes Associates, Inc., Fresno, California.
26 April.
- 27 U.S. Fish and Wildlife Service (USFWS) 1998. *Recovery Plan for Upland Species of the*
28 *San Joaquin Valley, California*. Region 1, Portland, Oregon.
- 29 U.S. Fish and Wildlife Service (USFWS). 1999. *Conservation Guidelines for the Valley*
30 *Elderberry Longhorn Beetle*. Sacramento Fish and Wildlife Office. Sacramento,
31 California. July 9.
- 32 U.S. Fish and Wildlife Service (USFWS). 2005. *Recovery Plan for Vernal Pool*
33 *Ecosystems of California and Southern Oregon*. Region 1, Portland, Oregon.
34 December 15.

- 1 U.S. Fish and Wildlife Service (USFWS). 2008. *Birds of Conservation Concern 2008*.
2 Division of Migratory Bird Management, Arlington, Virginia. December.
- 3 U.S. Fish and Wildlife Service (USFWS). 2009. *Species List for the Mendota Dam*
4 *Quadrangle* (ID: 381D). October 30.
- 5 U.S. Fish and Wildlife Service (USFWS). 2010. San Joaquin Kit Fox (*Vulpes macrotis*
6 *mutica*) 5-Year Review: Summary and Evaluation. Sacramento Fish and Wildlife
7 Office. Sacramento, California. February 12.
- 8 WHR. See California Wildlife Habitat Relationships System.

9 **28.8 Chapter 8 – Climate Change and Greenhouse Gas** 10 **Emissions**

- 11 Altor, A.E. and W.J. Mitsch. 2006. *Methane flux from created riparian marshes:*
12 *Relationship to intermittent versus continuous inundation and emergent*
13 *macrophytes*. Ecological Engineering (28): 224-234.
- 14 ARB. See California Air Resources Board.
- 15 Ballantyne, A.P, C.B. Alden, J.B. Miller, P.P. Tans, and J.W.C. White. 2012. *Increase in*
16 *observed net carbon dioxide uptake by land and oceans during the past 50 years*.
17 Nature (488): 70-73. August 2.
- 18 Brekke, L.D., N.L. Miller, K.E. Bashford, N.W.T. Quinn, and J.A. Dracup. 2004. *Climate*
19 *Change Impacts Uncertainty for Water Resources in the San Joaquin River Basin,*
20 *California*. Journal of the American Water Resources Association. Paper No.
21 02103. February.
- 22 Cal-Adapt. 2012a. Monthly Projected Air Temperatures (1950-2099), 10-year averages.
23 Data set from downscaled global climate models created for the 2008 Climate
24 Change Impacts Assessment. Available: <<http://cal-adapt.org/data/tabular/>>. Last
25 accessed April 2015.
- 26 Cal-Adapt. 2012b. Monthly Projected Snow Water Equivalence (1950-2099), 10-year
27 averages. Data sets from the downscaled global climate models created for the
28 2008 Climate Change Impacts Assessment. Available: <[http://cal-](http://cal-adapt.org/data/tabular/)
29 [adapt.org/data/tabular/](http://cal-adapt.org/data/tabular/)>. Last accessed April 2015.
- 30 California Air Resources Board (ARB). 2009a. *Detailed California-Modified GREET*
31 *Pathway for Compressed Natural Gas (CNG) from North American Natural Gas*.
32 Stationary Source Division. February 28.
- 33 California Air Resources Board (ARB). 2009b. *Detailed California-Modified GREET*
34 *Pathway for Liquefied Natural Gas (LNG) from North American and Remote*
35 *Natural Gas Sources*. Stationary Source Division. February 23.

- 1 California Air Resources Board (ARB). 2011. Greenhouse Gas Inventory Data.
2 Available: <<http://www.arb.ca.gov/cc/inventory/data/data.htm>>. Last accessed
3 March 2013.
- 4 California Air Resources Board (ARB). 2012. *Detailed California-Modified GREET*
5 *Pathway for Ultra Low Sulfur Diesel (ULSD) from Average Crude Refined in*
6 *California*. Stationary Source Division. September 12.
- 7 California Air Resources Board (ARB). 2013. *California Greenhouse Gas Emissions for*
8 *2000 to 2010 – Trends by Emissions and Other Indicators*. March 4.
- 9 California Air Resources Board (ARB). 2014a. *California Greenhouse Gas Emission*
10 *Inventory: 2000-2012*. 2014 Edition. May.
- 11 California Air Resources Board (ARB). 2014b. California Central Valley Basin
12 Assessment Area, in “Assessment Area Data File.” Compliance Offset Protocol
13 U.S. Forest Offset Projects. Documents for Projects Located in California,
14 Oregon, and Washington. Available:
15 <[http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2014.](http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2014.htm)
16 [htm](http://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2014.htm)>. Accessed October 2014.
- 17 California Climate Change Portal. 2014. “Take Action.” November. Available:
18 <www.climatechange.ca.gov>. Last accessed April 2015.
- 19 California Data Exchange Center (CDEC). 2013. CDEC Station San Joaquin River below
20 Bifurcation (SJB). California Department of Water Resources. Available:
21 <<http://cdec.water.ca.gov/>>. Accessed February 2013.
- 22 California Environmental Protection Agency (Cal/EPA). 2010. *Climate Action Team*
23 *Report to Governor Schwarzenegger and the California Legislature*. December.
- 24 California Irrigation Management Information (CIMIS). 2013. CIMIS Station 7,
25 Firebaugh/Telles. California Department of Water Resources. Available:
26 <<http://www.cimis.water.ca.gov/>>. Accessed February 2013.
- 27 California Natural Resources Agency (CNRA). 2014. Safeguarding California: Reducing
28 Climate Risk, An update to the 2009 California Climate Adaptation Strategy.
29 July.
- 30 California Regional Assessment Group. 2002. The Potential Consequences of Climate
31 Variability and Change for California, the California Regional Assessment. June
32 2002.
- 33 Council on Environmental Quality Guidance (CEQ). 2010. Draft NEPA Guidance on
34 Consideration of the Effects of Climate Change and Greenhouse Gas Emissions.
35 Memorandum for Heads of Federal Departments and Agencies. February 18.
- 36 DWR. *See* California Department of Water Resources.

- 1 EPA. *See* U.S. Environmental Protection Agency.
- 2 Intergovernmental Panel on Climate Change (IPCC). 2001. *Climate Change 2001: The*
3 *Scientific Basis*. Contribution of Working Group I to the Third Assessment Report
4 of the IPCC. Cambridge University Press.
- 5 Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007: The*
6 *Physical Science Basis*. Contribution of Working Group I to the Fourth
7 Assessment Report of the IPCC. Cambridge University Press.
- 8 Intergovernmental Panel on Climate Change (IPCC). 2014. *Climate Change 2014:*
9 *Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the
10 Fifth Assessment Report of the Intergovernmental Panel on Climate Change.
11 Cambridge University Press.
- 12 Lawrence Livermore National Laboratory (LLNL). 2013. Climate Change Model results,
13 website hosted by the Lawrence Livermore National Laboratory. Available:
14 <[http://gdo-](http://gdo-dcp.ucllnl.org/downscaled_cmip_projections/dcpInterface.html#Welcome)
15 [dcp.ucllnl.org/downscaled_cmip_projections/dcpInterface.html#Welcome](http://gdo-dcp.ucllnl.org/downscaled_cmip_projections/dcpInterface.html#Welcome)>.
16 Accessed February 2013.
- 17 Massey, R. and A. Ulmer. 2010. *Agriculture and Greenhouse Gas Emissions*.
18 Agricultural MU Guide. United States Department of Agriculture Director
19 Extension, University of Missouri.
- 20 Pacific Northwest Research Station. 2005. *Science Findings, Climate Change and*
21 *California: Potential Implications for Vegetation, Carbon, and Fire*. Issue 75,
22 August 2005.
- 23 PRBO Conservation Science. 2011. *Projected Effects of Climate Change in California:*
24 *Ecoregional Summaries Emphasizing Consequences for Wildlife*. February.
- 25 Reclamation. *See* U.S. Department of the Interior, Bureau of Reclamation.
- 26 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
27 *Restoration Program, Program Environmental Impact Statement/Report*. April.
28 SCH # 2007081125.
- 29 San Joaquin River Restoration Program (SJRRP). 2012. Attachment A – Initial
30 Alternatives Evaluation, in *Mendota Pool Bypass and Reach 2B Improvements*
31 *Project, Project Description Technical Memorandum*. October.
- 32 San Joaquin Valley Air Pollution Control District (SJVAPCD). 2009. *Climate Change*
33 *Action Plan: Addressing Greenhouse Gas Emission Impacts under the California*
34 *Environmental Quality Act*. Final Staff Report. December 17.
- 35 Tanzosh, J.K. 2005. Soil Carbon Dynamics and Gaseous Emissions in Riparian Zones in
36 Coshocton, Ohio. Thesis. Ohio State University.

- 1 TCR. *See* Climate Registry, The.
- 2 U.S. Environmental Protection Agency (EPA). 2014a. *Climate Change Indicators in the*
3 *United States: Global Greenhouse Gas Emissions*. May.
- 4 U.S. Environmental Protection Agency (EPA). 2014b. *Inventory of U.S. Greenhouse Gas*
5 *Emissions and Sinks: 1990 – 2012*. EPA 430-R-14-003. April 15.
- 6 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2011. *West-Wide*
7 *Climate Risk Assessments: Bias-Corrected and Spatially Downscaled Surface*
8 *Water Projections*. Technical Memorandum No. 86-68210-2011-01. March.
- 9 Whiting, G. J. and J. P. Chanton. 2001. *Greenhouse carbon balance of wetlands:*
10 *methane emission versus carbon sequestration*. *Tellus* (53B): 521-528.

11 **28.9 Chapter 9 – Cultural Resources**

- 12 Beck, W.A. and Y.D. Haase. 1974. *Historical Atlas of California*. University of
13 Oklahoma Press, Norman.
- 14 Bonte, H.S. 1931. *Financial and General Data Pertaining to Irrigation, Reclamation and*
15 *other Public Districts in California*. State of California Department of Public
16 Works, Division of Water Resources, Bulletin No. 37, California State Printing
17 Office, Sacramento.
- 18 Broadbent, S. 1974. *Conflict at Monterey: Indian Horse Raiding, 1820-1850*. *Journal of*
19 *California Anthropology* 1 (Spring): 89, 96-97.
- 20 Byrd, B.F., S. Wee, and J. Costello. 2009. *Cultural Resources Sensitivity Study and*
21 *Research Design for the San Joaquin River Restoration Program, Fresno,*
22 *Madera, Merced, and Stanislaus Counties, California*, Prepared for U.S. Bureau
23 of Reclamation, Sacramento, California.
- 24 California State Reclamation Board. 1966. *Lower San Joaquin River Flood Control*
25 *Project*. California State Reclamation Board, Sacramento.
- 26 Clough, C. W., and W. B. Secrest, Jr. 1984. *Fresno County, the Pioneer Years from the*
27 *Beginnings to 1900*. Panorama West Books, Sacramento.
- 28 Cook, S.F. 1955. *The Aboriginal Population of the San Joaquin Valley, California*.
29 *Anthropological Records*, Vol. 16:2, University of California Press, Berkeley and
30 Los Angeles, California.
- 31 Cook, S.F. 1960. *Colonial Expeditions to the Interior of California Central Valley, 1800-*
32 *1820*. University of California Press *Anthropological Records* 16(6): 239-292.

- 1 Cook, S.F. 1976. *The Conflict Between the California Indian and White Civilization*.
2 University of California Press, Berkeley and Los Angeles.
- 3 Davis-King, S. 2009. Native American Ethnographic Information in Support of the
4 Program Environmental Impact Statement/Report for the San Joaquin River
5 Restoration Program, Fresno, Madera, and Merced Counties, California. Draft.
6 Prepared for the Bureau of Reclamation, Sacramento.
- 7 Fremont, J.C. 1852. *The Exploring Expedition to the Rocky Mountains, Oregon, and*
8 *California*. Derby and Company, Buffalo.
- 9 Gilbert, R.H. 2011a. *Cultural Resources Clearance- San Joaquin River Restoration*
10 *Program: Proposed Borrow Test Pit (TP) Locations within Reach 2B, Fresno*
11 *County*. California Department of Water Resources. August 26, 2011.
- 12 Gilbert, R.H. 2011b. *Cultural Resources Memo- Excavation Results for the San Joaquin*
13 *River Restoration Program: Borrow Test Pit Locations within Reach 2B, Fresno*
14 *County*. California Department of Water Resources. October 3, 2011.
- 15 Harding, S.T. 1960. *Water in California*. N-P Publications, Palo Alto, California.
- 16 Hayes, D. 2007. *Historical Atlas of California*. University of California Press, Berkeley.
- 17 Hundley, N. 1992. *The Great Thirst: Californians and Water, 1770s-1990s*. University of
18 California Press, Berkeley.
- 19 Jackson, W.T., R.F. Herbert, and S.R. Wee. 1990. Engineers and Irrigation: Report of the
20 Board of Commissioners on the Irrigation of the San Joaquin, Tulare, and
21 Sacramento Valleys of the State of California, 1873. Engineer Historical Studies
22 Number 5. U.S. Army Corps of Engineers, Office of History, Fort Belvoir,
23 Virginia.
- 24 Kroeber, A.L. 1925. *Handbook of the Indians of California*. Bureau of American
25 Ethnology Bulletin 78. Smithsonian Institution, Washington, DC. Reprinted by
26 Dover Publications, New York, 1976.
- 27 Latta, F.F. 1977. *The Handbook of the Yokuts Indians*. Second edition (revised and
28 enlarged). Bear State Books, Santa Cruz, California.
- 29 Moehring, E.P. 2004. *Urbanism and Empire in the Far West, 1840-1890*. University of
30 Nevada Press, Reno.
- 31 Moratto, M.J. 1984. *California Archaeology*. Academic Press, New York.
- 32 Olsen, W.H. and L.A. Payen. 1969. *Archeology of the Grayson Site, Merced County,*
33 *California*. California Department of Parks and Recreation, Archaeological
34 Reports 12.

- 1 Pisani, D.J. 1984. *From Family Farm to Agribusiness*. University of California Press,
2 Berkeley.
- 3 Powers, S. 1877. *Tribes of California*. Contributions to North American Ethnology, vol.
4 3. US Department of the Interior, Geographical and Geological Survey of the
5 Rocky Mountain Region, Washington, DC. Reprinted in 1976, University of
6 California Press. Berkeley and Los Angeles.
- 7 Reclamation. See U.S. Department of the Interior, Bureau of Reclamation.
- 8 Riddell, F.A. 2002. "The Status of San Joaquin Archaeology," In *Essay in California*
9 *Archaeology: A Memorial to Franklin Fenenga*, edited by William J. Wallace and
10 Francis A. Riddell, Contributions of the University of California Archaeological
11 Research Facility, Berkeley, No 60:55-61.
- 12 Riddell, F.A. and W.H. Olsen. 1969. *An Early Man Site in the San Joaquin Valley,*
13 *California*. American Antiquity 34:121-130.
- 14 Rosenthal, J.S., G.G. White, and M. Q. Sutton. 2007. "The Central Valley: A View from
15 the Catbird's Seat," In *California Prehistory: Colonization, Culture, and*
16 *Complexity*, edited by Terry L. Jones and Kathryn Klar, pp. 147-164. Altamira
17 Press, Walnut Creek, California.
- 18 Rosenthal, J.S. and J. Meyer. 2004. *Cultural Resources Inventory of California*
19 *Department of Transportation (Caltrans) District 10 Rural Conventional*
20 *Highways-Volume III: Geoarchaeological Study; Landscape Evolution and the*
21 *Archaeological Record of Central California*. Far Western Anthropological
22 Research Group, Inc., Davis, California. Submitted to California Department of
23 Transportation, District 10, Stockton. On file, Central California Information
24 Centre, California State University, Stanislaus.
- 25 San Joaquin River Restoration Program (SJRRP). 2010. *Historic Architecture Inventory*
26 *and Evaluation Report*. Mendota Pool Bypass and Reach 2B Channel
27 Improvement, Fresno and Madera Counties, California. Prepared by JRP
28 Historical Consulting, LLC.
- 29 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
30 *Restoration Program, Program Environmental Impact Statement/Report*. April.
31 SCH # 2007081125.
- 32 Smith, J.S. 1977. *The Southwest Expedition of Jedediah S. Smith*, edited by George R.
33 Brooks. Arthur C. Clark, Glendale, California.
- 34 Thorne, R.M. 1991. *Technical Brief Number 5: Intentional Site Burial: A Technique to*
35 *Protect against Natural or Mechanical Loss*. U.S. National Park Service
36 Publications and Papers. Paper 105.

- 1 Tinkham, G.H. 1923. *History of San Joaquin County, California*. Historic Record
2 Company, Los Angeles, California.
- 3 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2011. *Draft*
4 *Historic Properties Survey Report*. Mendota Pool Bypass and Reach 2B
5 Improvements Project, San Joaquin River Restoration Program, California. Mid-
6 Pacific Region. January.
- 7 W.W. Elliot & Co. 1882. *History of Fresno County*. Wallace W. Elliot & Co., San
8 Francisco, California.
- 9 Wallace, W.J. 1978. “Northern Valley Yokuts” in *Handbook of North American Indians*
10 *Vol. 8, California*, Ed. Robert F. Heizer, pp. 462-470. Smithsonian Institution,
11 Washington D.C.
- 12 Weeks, K.D. and A.E. Grimmer. 1995. The Secretary of the Interior’s Standards for the
13 Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating,
14 Restoring & Reconstructing Historic Buildings. U.S. National Park Service.
- 15 **28.10 Chapter 10 – Environmental Justice**
- 16 California Employment Development Department (EDD). 2012. Occupational
17 Employment and Wage Data, Occupational Employment Statistics (OES) Survey
18 Results.
- 19 California Resources Agency. *Undated*. Environmental Justice Policy.
- 20 Council on Environmental Quality (CEQ). 1997. Environmental Justice, Guidance under
21 the National Environmental Policy Act.
- 22 U.S. Department of the Interior. 1995. *National Environmental Policy Act (NEPA)*
23 *Responsibilities under the Departmental Environmental Justice Policy*.
24 Environmental Compliance Memorandum No. ECM95-3. Office of
25 Environmental Policy and Compliance. May 30.
- 26 EDD. *See* California Employment Development Department.
- 27 Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental
28 Justice in Minority Populations and Low-Income Populations. Available:
29 <<http://www.archives.gov/federal-register/executive-orders/pdf/12898.pdf>>. Last
30 accessed March 2015.
- 31 U.S. Census Bureau. 2010. 2010 Decennial Census of Population – Summary File 1
32 (SF1) Dataset. American Factfinder. Available:
33 <http://factfinder2.census.gov/faces/nav/jsf/pages/wc_dec.xhtml>. Accessed
34 August 2014.

- 1 U.S. Census Bureau. 2012. Equal Employment Opportunity (EEO) Tabulation 2006-2010
2 (American Community Survey 5-Year Estimates). November 29, 2012.
3 Available: <<http://www.census.gov/people/eotabulation/>>. Accessed August
4 2014.
- 5 U.S. Census Bureau. 2013. 2008-2012 American Community Survey 5-Year Estimates.
6 American Factfinder. December 2013.
- 7 U.S. Department of Agriculture (USDA). 2014. 2012 Census of Agriculture. Census
8 Volume 1, Chapter 2: County Level Data. Available:
9 <http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/California/>. Accessed August 2014.
10
- 11 U.S. Department of Energy (DOE). 1997. Environmental Justice Information Brief EH-
12 411-97/0001. Office of Environmental Policy and Assistance. February.
- 13 **28.11 Chapter 11 – Geology and Soils**
- 14 Bartow, J.A. 1991. The Cenozoic Evolution of the San Joaquin Valley, California. U.S.
15 Geological Survey Professional Paper 1501. Washington.
- 16 California Department of Conservation, California Geological Survey (CGS). 2002a.
17 Note 36: California Geomorphic Provinces. December.
- 18 California Department of Conservation, California Geological Survey (CGS). 2002b.
19 Simplified Geologic Map of California. Map Sheet 57.
- 20 California Department of Conservation, California Geological Survey (CGS). 2002c.
21 “Interactive Fault Parameter Map of California.” Available:
22 <http://www.conservation.ca.gov/cgs/rghm/psha/fault_parameters/htm/Pages/Index.aspx>. Accessed October 28, 2010. Last accessed April 2015.
23
- 24 California Seismic Safety Commission (CSSC) 2003. Earthquake Shaking Potential for
25 California. California Seismic Safety Commission Publication No. 03-02.
- 26 CGS. *See* California Department of Conservation, California Geological Survey.
- 27 California Department of Conservation, Office of Mine Reclamation. 2011. Mines List.
28 Available: <<http://maps.conservation.ca.gov/mol/mol-app.html>>. Last accessed
29 April 2015.
- 30 Ferriz, H. 2001. Groundwater Resources of Northern California - An Overview, in
31 Ferriz, H. and R. Anderson, (eds.), *Engineering Geology Practice in Northern*
32 *California*. Association of Engineering Geologists Special Publication 12 and
33 California Division of Mines and Geology Bulletin 210.

San Joaquin River Restoration Program

- 1 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
2 *Update*. October 3.
- 3 Jennings, C.W. and W.A. Bryant. 2010. *Fault Activity Map of California*. California
4 Geological Survey Geologic Data Map No. 6, Scale 1:750,000.
- 5 Kohler, S. 2006. *California Non-Fuel Minerals 2006*. California Geological Survey.
- 6 Lettis, W.R., and J.R. Unruh. 1991. Quaternary geology of the Great Valley, California,
7 in Morrison, R.B. (ed.), *Quaternary Nonglacial Geology: Conterminous U.S.*
8 Geological Society of America, Geology of North America, v. K-2, pp. 164 - 176.
- 9 Madera County. 1995. *Madera County General Plan Policy Document*. October 24.
- 10 McBain and Trush, Inc. (eds.). 2002. *San Joaquin River Restoration Study Background*
11 *Report*. Prepared for Friant Water Users Authority, Lindsay California, and
12 Natural Resources Defense Council, San Francisco, California. December.
- 13 Merced County. 2007. *Merced County General Plan Public Review Draft Background*
14 *Report*. Prepared by Mintier and Associates, et al. June 21.
- 15 Mussetter Engineering, Inc. 2002. Hydraulic and Sediment Continuity Modeling of the
16 San Joaquin River From Friant Dam to Mendota Dam, California. Prepared for
17 the U.S. Department of the Interior, Bureau of Reclamation, Contract No. 98-CP-
18 20-20060.
- 19 NRCS. *See* U.S. Department of Agriculture, Natural Resources Conservation Service.
- 20 Page, R.W. 1986. *Geology of the Fresh Groundwater Basin of the Central Valley,*
21 *California, with Texture Maps and Sections*. U.S. Geological Survey Professional
22 Paper 1401-C, 54 p. Washington.
- 23 Reclamation. *See* U.S. Department of the Interior, Bureau of Reclamation.
- 24 Rojstaczer, S.A., R.E. Hamon, S.J. Deveral, and C.A. Massey. 1991. *Evaluation of*
25 *Selected Data to Assess the Causes of Subsidence in the Sacramento-San Joaquin*
26 *Delta, California*. U.S. Geological Survey Open-File Report 91-193.
- 27 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
28 *Restoration Program, Program Environmental Impact Statement/Report*. April.
29 SCH # 2007081125.
- 30 San Joaquin River Restoration Program (SJRRP). 2012. Mendota Pool Sediment Quality
31 Investigation – Analytical Results, Data Assessment, and Quality Assurance
32 Summary. February 10.
- 33 San Joaquin Valley Drainage Implementation Program (SJVDP). 1990. *A Management*
34 *Plan for Agricultural Drainage and Related Problems on the Westside San*

- 1 *Joaquin Valley*. Final Report of the San Joaquin Valley Drainage Program.
2 September.
- 3 Sneed, M., J. Brandt, and M. Solt. 2013. *Land subsidence along the Delta-Mendota*
4 *Canal in the Northern Part of the San Joaquin Valley, California, 2003–10*. U.S.
5 Geological Survey Scientific Investigations Report 2013–5142, 87 p.
- 6 University of California, Division of Agricultural Sciences. 1980. *Generalized Soil Map*
7 *of California*. Publication 4028. 51 p. May.
- 8 U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). 2008.
9 Web Soil Survey. Available: <<http://websoilsurvey.nrcs.usda.gov>>. Accessed
10 April 30, 2008.
- 11 U.S. Geological Survey (USGS). 1996. *Database of Potential Sources for Earthquakes*
12 *Larger than Magnitude 6 in Northern California*. Open-File Report 96-705.
13 Working Group on Northern California Earthquake Potential.
- 14 U.S. Geological Survey (USGS). 2007. Erodible Soils, Soil Survey Geographic database.
- 15 U.S. Geological Survey (USGS). 2008. Erodible Soils, Soil Survey Geographic database.
- 16 Working Group on California Earthquake Probabilities (WG02). 2003. Earthquake
17 probabilities in the San Francisco Bay region: 2002 – 2031. U.S. Geological
18 Survey Open-File Report 03-214.

19 **28.12 Chapter 12 – Hydrology – Flood Management**

- 20 California Department of Water Resources (DWR). 2012. *2012 Central Valley Flood*
21 *Protection Plan*. Central Valley Flood Management Planning Program,
22 FloodSAFE California. June.
- 23 Corps. *See* U.S. Army Corps of Engineers.
- 24 DWR. *See* California Department of Water Resources.
- 25 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
26 *Update*. October 3.
- 27 Madera County. 1995. *Madera County General Plan Policy Document*. October 24.
- 28 McBain and Trush, Inc. (eds.). 2002. *San Joaquin River Restoration Study Background*
29 *Report*. Prepared for Friant Water Users Authority, Lindsay California, and
30 Natural Resources Defense Council, San Francisco, California. December.
- 31 Reclamation. *See* U.S. Department of the Interior, Bureau of Reclamation.

- 1 Reclamation Board. 1969. *Operation and Maintenance Manual for San Joaquin River*
2 *and Chowchilla Canal Bypass Automatic Control Structures and Appurtenances.*
3 Lower San Joaquin River Flood Control Project.
- 4 U.S. Army Corps of Engineers (Corps). 1999. Sacramento and San Joaquin River Basins,
5 California, Post-Flood Assessment for 1983, 1986, 1995, and 1997. Sacramento
6 District. March.
- 7 U.S. Army Corps of Engineers (Corps). 2000a. *Design and Construction of Levees.*
8 Engineer Manual 1110-2-1913. Engineering and Design. April 30.
- 9 U.S. Army Corps of Engineers (Corps). 2000b. *Guidelines for Landscape Planting and*
10 *Vegetation Management at Floodwalls, Levees, & Embankment Dams.* Engineer
11 Manual 1110-2-301. Engineering and Design. January 1.
- 12 U.S. Department of the Interior, Bureau of Reclamation and California Department of
13 Water Resources (Reclamation and DWR). 2005. Flood Damage Reduction
14 Technical Appendix, in *Upper San Joaquin River Basin Storage Investigation*
15 *Initial Alternatives Information Report.* Prepared in conjunction with the
16 CALFED Bay-Delta Program. Prepared by MWH. June.
- 17 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2012. *San*
18 *Joaquin River Restoration Daily Flow Model (SJRRW) Documentation for the*
19 *Reach 4B Study.* Technical Report No. 86-68210-2012-04. September 18.

20 **28.13 Chapter 13 – Hydrology – Groundwater**

- 21 California Department of Water Resources (DWR). 2003. *California's Groundwater,*
22 *Bulletin 118 – Update 2003.* October.
- 23 California Department of Water Resources (DWR). 2005. San Joaquin Valley Drainage
24 Monitoring Program 2001, District Report. November.
- 25 California Department of Water Resources (DWR). 2006. San Joaquin Valley
26 Groundwater Basin, Delta-Mendota Subbasin. California's Groundwater, Bulletin
27 118. January 20.
- 28 California Department of Water Resources (DWR). 2014a. San Joaquin River Hydrologic
29 Region, in *California Water Plan Update 2013, Investing in Innovation and*
30 *Infrastructure.* Volume 2, Regional Reports. October.
- 31 California Department of Water Resources (DWR). 2014b. Resource Management
32 Strategies, in *California Water Plan Update 2013, Investing in Innovation and*
33 *Infrastructure.* Volume 3. Bulletin 160-13. October.
- 34 DWR. *See* California Department of Water Resources.

- 1 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
2 *Update*. October 3.
- 3 Madera County. 1995. *Madera County General Plan Policy Document*. October 24.
- 4 Mathany, T.M., M.K. Landon, J.L. Shelton, and K. Belitz. 2013. Groundwater-quality
5 data in the Western San Joaquin Valley study unit, 2010—Results from the
6 California GAMA Program. U.S. Geological Survey Data Series 706. 102 p.
- 7 San Joaquin River Exchange Contractors Water Authority. 2008. *Updated 3030*
8 *Groundwater Management Plan for the San Joaquin Exchange Contractors*.
9 Adopted April 4.
- 10 San Joaquin River Resources Management Coalition (RMC). 2007. Appraisal Report:
11 San Joaquin River Settlement Agreement and Legislation, prepared for San
12 Joaquin River Resource Management Coalition. September 20.
- 13 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
14 *Restoration Program, Program Environmental Impact Statement/Report*. April.
15 SCH # 2007081125.
- 16 San Joaquin River Restoration Program (SJRRP). 2012a. Reach 2B GW Monitoring
17 Locations. Monitoring Well Atlas. May 29. Available:
18 <<http://restoresjr.net/flows/Groundwater/index.html>>. Accessed July 2013.
- 19 San Joaquin River Restoration Program (SJRRP). 2012b. *Mendota Pool Bypass and*
20 *Reach 2B Improvements Project, Project Description Technical Memorandum*.
21 October.
- 22 San Joaquin River Restoration Program (SJRRP). 2014. *Draft Seepage Management*
23 *Plan*. September.
- 24 Sneed, M., J. Brandt, and M. Solt. 2013. *Land subsidence along the Delta-Mendota*
25 *Canal in the Northern Part of the San Joaquin Valley, California, 2003–10*. U.S.
26 Geological Survey Scientific Investigations Report 2013–5142, 87 p.
- 27 United States Geological Survey (USGS). 2009. California’s Central Valley Groundwater
28 Study: A Powerful New Tool to Assess Water Resources in California’s Central
29 Valley. Fact Sheet 2009-3057. July.
- 30 Williamson, A.K., D.E. Prudic, and L.A. Swain. 1989. *Groundwater Flow in the Central*
31 *Valley, California*. U.S. Geological Survey Professional Paper 1401-D. 127 p.

1 **28.14 Chapter 14 – Hydrology – Surface Water Resources**
2 **and Water Quality**

- 3 Bull, W.B. 1964. *Alluvial Fans and Near-Surface Subsidence in Western Fresno County,*
4 *California*. U.S. Geological Survey Prof. Paper 437-A, pp. A1-A71.
- 5 California Department of Water Resources (DWR). 2011. Data downloaded from
6 California Data Exchange Center. Available: <<http://cdec.water.ca.gov/>>.
7 Accessed October 7, 2011.
- 8 Central Valley Regional Water Quality Control Board (RWQCB). 2011. *Water Quality*
9 *Control Plan (Basin Plan) for the Sacramento River Basin and San Joaquin River*
10 *Basin*. Fourth Edition. Revised October 2011 with approved amendments.
- 11 DWR. *See* California Department of Water Resources.
- 12 EPA. *See* U.S. Environmental Protection Agency.
- 13 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
14 *Update*. October 3.
- 15 McBain and Trush, Inc. (eds.). 2002. *San Joaquin River Restoration Study Background*
16 *Report*, prepared for Friant Water Users Authority and Natural Resources Defense
17 Council. December.
- 18 Mussetter Engineering, Inc. 2002. Hydraulic and Sediment Continuity Modeling of the
19 San Joaquin River From Friant Dam to Mendota Dam, California. Prepared for
20 the U.S. Department of the Interior, Bureau of Reclamation, Contract No. 98-CP-
21 20-20060.
- 22 NRCS. *See* U. S. Department of Agriculture, Natural Resources Conservation Service.
- 23 Ouchi, S. 1983. Response of alluvial rivers to active tectonics. Ph.D. Dissertation,
24 Colorado State University, Fort Collins, Colorado.
- 25 Poland, J.F., B.E. Lofgren, R.L. Ireland, and R.G. Pugh. 1975. Land subsidence in the
26 San Joaquin Valley as of 1972. U.S. Geological Survey, Prof. Paper 437-H, 78 p.
- 27 Reclamation. *See* U.S. Department of the Interior, Bureau of Reclamation.
- 28 RWQCB. *See* Central Valley Regional Water Quality Control Board.
- 29 San Joaquin River Resources Management Coalition (RMC). 2007. Appraisal Report:
30 San Joaquin River Settlement Agreement and Legislation, prepared for San
31 Joaquin River Resource Management Coalition. September 20.
- 32 San Joaquin River Restoration Program (SJRRP). 2008. *Draft Background Report on*
33 *Friant Dam Operations*. February 7.

- 1 San Joaquin River Restoration Program (SJRRP). 2009. *Draft Environmental Assessment*
2 *and Finding of No Significant Impact/Initial Study and Mitigated Negative*
3 *Declaration for the Water Year 2010 Interim Flows Project*. June.
- 4 San Joaquin River Restoration Program (SJRRP). 2011a. Water Quality Measurements,
5 1/2011 - 6/8/2011. Available: <<http://restoresjr.net/flows/Data/index.html>>.
6 Accessed August 2011.
- 7 San Joaquin River Restoration Program (SJRRP). 2011b. *Draft San Joaquin River*
8 *Restoration Program, Program Environmental Impact Statement/Report*. April.
9 SCH # 2007081125.
- 10 San Joaquin River Restoration Program (SJRRP). 2011c. *Draft Seepage Management*
11 *Plan*. Preliminary Draft Subject to Revision. March 28.
- 12 San Joaquin River Restoration Program (SJRRP). 2011d. *Environmental Assessment,*
13 *Mendota Dam Sluice Gates Replacement Project*. December.
- 14 San Joaquin River Restoration Program (SJRRP). 2011e. *Scope of Work for Mendota*
15 *Pool Sediment Sampling, August 2011*. April 5.
- 16 San Joaquin River Restoration Program (SJRRP). 2012. *Mendota Pool Sediment Quality*
17 *Investigation – Analytical Results, Data Assessment, and Quality Assurance*
18 *Summary*. In Support of the Mendota Pool Bypass and Reach 2B Improvements
19 Project, San Joaquin River Restoration Program. February 10.
- 20 San Joaquin River Restoration Program (SJRRP). 2013. Time Series Data, Water Quality
21 Measurements. 2009-2011. Available:
22 <<http://restoresjr.net/flows/Data/index.html>>. Last accessed February 2013.
- 23 Sneed, M., J. Brandt, and M. Solt. 2013. *Land subsidence along the Delta-Mendota*
24 *Canal in the Northern Part of the San Joaquin Valley, California, 2003–10*. U.S.
25 Geological Survey Scientific Investigations Report 2013–5142, 87 p.
- 26 State Water Resources Control Board (SWRCB). 2009. *National Pollutant Discharge*
27 *Elimination System General Permit for Storm Water Discharges Associated with*
28 *Construction and Land Disturbance Activities, as amended*. Order No. 2009-
29 0009-DWQ, NPDES No. CAS000002. Adopted September 2, 2009.
- 30 Tetra Tech 2011. Geomorphic Analysis for the San Joaquin River Reach 2B Alternative
31 Evaluation. Draft Technical Memorandum. April 25. 30 p.
- 32 U.S. Army Corps of Engineers and California Department of Water Resources (Corps
33 and DWR). 2002. Appendix B, Synthetic Hydrology Technical Documentation, in
34 *Technical Studies Documentation*. Sacramento and San Joaquin River Basins
35 Comprehensive Study, California. December. 286 p.

- 1 U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 1990.
2 *Soil Survey of Merced County, California, Western Part*. Prepared in cooperation
3 with University of California (Agricultural Experiment Station). 288 p.
- 4 U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 2006.
5 *Soil Survey of Fresno County, California, Western Part*. Prepared in cooperation
6 with University of California (Agricultural Experiment Station) and U.S.
7 Department of Interior, Bureau of Land Management. 1159 p.
- 8 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2011. *Draft*
9 *Sediment Transport and Vegetation Modeling of Reach 2B Alternatives for the*
10 *San Joaquin River Restoration Program*. Technical Services Center Report SRH-
11 2011-33. August. 64 p.
- 12 U.S. Department of the Interior, Bureau of Reclamation and California Department of
13 Water Resources (Reclamation and DWR). 2005. Flood Damage Reduction
14 Technical Appendix, in *Upper San Joaquin River Basin Storage Investigation,*
15 *Initial Alternatives Information Report*. Prepared in conjunction with the
16 CALFED Bay-Delta Program. Prepared by MWH. June.
- 17 U.S. Environmental Protection Agency (EPA). 2007. *Tulare Lake Basin Hydrology and*
18 *Hydrography: A Summary of the Movement of Water and Aquatic Species*.
19 Document Number 909R07002. Prepared by ECORP Consulting, Inc. April 12.
- 20 U.S. Geological Survey (USGS). 2011. Water quality data for gaging stations USGS
21 11251000 (San Joaquin river below Friant, CA), USGS 11253115 (San Joaquin
22 river below Chowchilla Canal intake near Mendota), USGS 11253500 (James
23 Bypass [Fresno Slough] near San Joaquin, CA), USGS 11254000 (San Joaquin
24 river near Mendota CA), USGS 364620120153701 (San Joaquin river nr Napa
25 Ave near Mendota CA), and USGS 364718120221800 (San Joaquin river below
26 Mendota Pool [Bass Ave] CA).
- 27 Western Regional Climate Center. 2011. Data for Stations Friant Government Camp,
28 California (043261), Madera, California (045233), Fresno WSO AP, California
29 (043257).
- 30 Williams, G.P. 1978. *Bank-Full Discharge of Rivers*. Water Resources Research 14, pp.
31 1141–1154.
- 32 Wolman, M.G., and J.P. Miller. 1960. Magnitude and Frequency of Forces in
33 Geomorphic Processes. *Journal of Geology* 68, pp. 54–74.

1 **28.15 Chapter 15 – Hydrology – Wetlands and Aquatic**
 2 **Resources**

3 California Department of Fish and Wildlife (DFW). 2010. *List of California Vegetation*
 4 *Alliances*, DFW Biogeographic Data Branch Vegetation Classification and
 5 Mapping Program.

6 DFW. *See* California Department of Fish and Wildlife.

7 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
 8 *Update*. October 3.

9 Hickman, J.C. (ed.). 1993. *The Jepson Manual: Higher Plants of California*. University
 10 of California Press. Berkeley, California.

11 Hickson, pers. comm., 2009. Telephone conversation between Diana Hickson, Senior
 12 Vegetation Ecologist, DFW, and George Strnad, Project Plant Ecologist, URS.
 13 December 10.

14 Madera County. 1995. *Madera County General Plan Policy Document*. October 24.

15 McBain and Trush, Inc. (eds.). 2002. *San Joaquin River Restoration Study Background*
 16 *Report*. Prepared for Friant Water Users Authority, Lindsay California, and
 17 Natural Resources Defense Council, San Francisco, California. December.

18 National Invasive Species Council (NISC). 2008. *2008–2012 National Invasive Species*
 19 *Management Plan*. Department of the Interior, Washington, D.C. August.

20 San Joaquin River Restoration Program (SJRRP). 2010. *Mendota Pool Bypass and Reach*
 21 *2B Improvements Project Draft Technical Memorandum on Existing*
 22 *Environmental Conditions: Data Needs and Survey Approach*. March.

23 San Joaquin River Restoration Program (SJRRP). 2011. *Mendota Pool Bypass and Reach*
 24 *2B Improvements Project Technical Memorandum on Regulatory Compliance*.
 25 July.

26 San Joaquin River Restoration Program (SJRRP). 2012. Attachment A – Initial
 27 Alternatives Evaluation, in *Mendota Pool Bypass and Reach 2B Improvements*
 28 *Project, Project Description Technical Memorandum*. October.

29 U.S. Army Corps of Engineers (Corps). 1987. *Corps of Engineers Wetlands Delineation*
 30 *Manual*. Wetlands Research Program Technical Report Y-87-1. U.S. Army Corps
 31 of Engineers Waterways Experiment Station, Vicksburg, MS. January.

32 U.S. Army Corps of Engineers (Corps). 2005. Ordinary High Water Mark Identification.
 33 Regulatory Guidance Letter No. 05-05. December 7.

- 1 U.S. Army Corps of Engineers (Corps). 2008a. *Regional Supplement to the Corps of*
2 *Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*.
3 Engineering Research and Development Center/Environmental Laboratory TR-
4 08-28. Wetlands Regulatory Assistance Program. Vicksburg, MS.
- 5 U.S. Army Corps of Engineers (Corps). 2008b. *A Field Guide to the Identification of the*
6 *Ordinary High Water Mark (OHWM) in the Arid West Region of the Western*
7 *United States, A Delineation Manual*. Prepared by Lichvar, Robert W., and
8 Shawn M. McColley. Engineering Research and Development Center/Cold
9 Regions Research and Engineering Laboratory TR-08-12. August.
- 10 U.S. Army Corps of Engineers (Corps). 2014. “Navigable Waterways in the Sacramento
11 District.” Sacramento District. Available:
12 <<http://www.spk.usace.army.mil/Missions/Regulatory/Jurisdiction/NavigableWatersoftheUS.aspx>>.
13
- 14 U.S. Department of Agriculture, Soil Conservation Service (SCS). 1962. *Soil Survey*
15 *Madera Area, California*. Prepared in cooperation with the California
16 Agricultural Experiment Station. Author: L.K. Stromberg. Issued May 1962,
17 reprinted December 1990.
- 18 U.S. Department of Agriculture, Soil Conservation Service (SCS). 1971. *Soil Survey*
19 *Eastern Fresno Area, California*. Prepared in cooperation with the California
20 Agricultural Experiment Station. Author: G.L. Huntington. October.
- 21 U.S. Department of Agriculture, National Resource Conservation Service (NRCS) 2008a.
22 Soil Survey Geographic Database for Fresno County, California & Soil Survey
23 Geographic Database for Madera Area, California, Western Part, CA653.
24 Available: <<http://SoilDataMart.nrcs.usda.gov/>>. Originally accessed January 2.
- 25 U.S. Department of Agriculture, National Resource Conservation Service (NRCS) 2008b.
26 Soil Survey Geographic Database for Madera Area, California, CA651.
27 Available: <<http://SoilDataMart.nrcs.usda.gov/>>. Originally accessed January 2.
- 28 U.S. Fish and Wildlife Service (USFWS) 2009. National Wetlands Inventory.

29 **28.16 Chapter 16 – Land-Use Planning and Agricultural**
30 **Resources**

- 31 California Department of Conservation (DOC). 1997. *California Agricultural Land*
32 *Evaluation and Site Assessment Model Instruction Manual*. Sacramento,
33 California.
- 34 California Department of Conservation (DOC). 2007a. “Williamson Act Program –
35 Farmland Security Zones.” Available:

- 1 <[http://www.conservation.ca.gov/dlrp/lca/farmland_security_zones/Pages/index.a](http://www.conservation.ca.gov/dlrp/lca/farmland_security_zones/Pages/index.aspx)
2 spx>. Accessed April 22, 2013.
- 3 California Department of Conservation (DOC). 2007b. “FMMP – Important Farmland
4 Map Categories.” Sacramento, California. Available:
5 <http://www.consrv.ca.gov/DLRP/fmmp/mccu/map_categories.htm>. Accessed
6 April 22, 2013.
- 7 California Department of Conservation (DOC). 2007c. “California Farmland
8 Conservancy Program – Applying for Funding.” Available:
9 <http://www.conservation.ca.gov/dlrp/cfcp/funding/Pages/grant_categories.aspx>
10 . Accessed April 22, 2013.
- 11 California Department of Conservation (DOC). 2007d. “California Farmland
12 Conservancy Program – Overview.” Available:
13 <<http://www.conservation.ca.gov/dlrp/cfcp/overview/Pages/index.aspx>>.
14 Accessed April 22, 2013.
- 15 California Department of Conservation (DOC). 2010a. Important Farmland for Fresno
16 and Madera Counties. Division of Land Resource Protection, Farmland Mapping
17 and Monitoring Program. Available:
18 <http://redirect.conservation.ca.gov/dlrp/fmmp/product_page.asp>. Last accessed
19 April 2015.
- 20 California Department of Conservation (DOC). 2010b. *California Land Conservation*
21 *(Williamson) Act 2010 Status Report*. Williamson Act Program. November.
- 22 California Department of Finance. 2012. E-1 Population Estimates for Cities, Counties,
23 and the State with Annual Percent Change – January 1, 2011 and 2012.
24 Sacramento, California. May.
- 25 California Resources Agency. 2004. California General Plans. California Spatial
26 Information Library (CaSIL), Cal-Atlas Geospatial Clearinghouse. Available:
27 <<http://atlas.ca.gov/download.html#/casil/planning/planningAndDevelopment>>.
28 Accessed November 2011.
- 29 California State Lands Commission (CSLC). 2011. *Preliminary Record of Survey –*
30 *Administrative Map of the San Joaquin River, Reach 2B – From the Chowchilla*
31 *Bifurcation Structure to the Mendota Dam – Portions of Sections 16, 17, 19, 20,*
32 *21, 22, 23, 25, 26, 27, & 36 – Township 13 South, Range 15 East, M.D.M. –*
33 *Fresno & Madera Counties, California.*
- 34 DOC. *See* California Department of Conservation.
- 35 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
36 *Update*. October 3.

- 1 Fresno County. 2004. Land Use Regulation and Planning. Chapter 1, General Provisions
2 Sections 800-803.19 of the Ordinance Code of the County of Fresno. Part VII.
- 3 Fresno County. 2013. Zoning. GIS Shapefiles List. Available:
4 <<http://www.co.fresno.ca.us/DepartmentPage.aspx?id=52122>>. Last accessed
5 July 2014.
- 6 Ma, Z., D.P. Morgan, and T.J. Michailides. 2001. Effects of Water Stress on
7 Botryosphaeria Blight of Pistachio Caused by *Botryosphaeria dothidea*. The
8 American Phytopathological Society. 85(7):745-749.
- 9 Madera County. 1995. *Madera County General Plan Policy Document*. October 24.
- 10 Madera County. 2015. Madera County, California Code of Ordinances. Title 18-Zoning.
- 11 NRCS. See U.S. Department of Agriculture, Natural Resources Conservation Service.
12 U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS).
13 2013a. "Farmland Protection Policy Act." Available:
14 <<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/fppa/>>.
15 Accessed April 2013.
- 16 U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS).
17 2013b. "Land Evaluation and Site Assessment." Available:
18 <[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/?cid=nrcs143_](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/?cid=nrcs143_008438)
19 [008438](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/?cid=nrcs143_008438)>. Accessed April 2013.
- 20 San Joaquin River Restoration Program (SJRRP). 2011a. *Draft San Joaquin River*
21 *Restoration Program, Program Environmental Impact Statement/Report*. April.
22 SCH # 2007081125.
- 23 San Joaquin River Restoration Program (SJRRP). 2011b. *Mendota Pool Bypass and*
24 *Reach 2B Improvements Project Technical Memorandum on Regulatory*
25 *Compliance*. July.
- 26 San Joaquin River Restoration Program (SJRRP). 2012a. *Mendota Pool Bypass and*
27 *Reach 2B Improvements Project, Project Description Technical Memorandum*.
28 October.
- 29 San Joaquin River Restoration Program (SJRRP). 2012b. *San Joaquin River Restoration*
30 *Program Record of Decision*. September 28.

31 **28.17 Chapter 17 – Noise and Vibration**

- 32 California Department of Transportation (Caltrans). 2011. Annual average daily traffic
33 volumes and traffic mixes. Operational Traffic Data Branch. Available:
34 <<http://traffic-counts.dot.ca.gov>>. Last accessed April 2015.

- 1 City of Mendota. 2009. Chapter 5, Noise Element, in *City of Mendota General Plan*
2 *Update 2005-2025*. Adopted August 11.
- 3 City of Mendota. 2010. Chapter 9.05 – Excessive Noise, in *City of Mendota Municipal*
4 *Code*.
- 5 Federal Transit Administration (FTA). 2006. *Transit Noise and Vibration Impact*
6 *Assessment*. Report No. FTA-VA-90-1003-06. Office of Planning and
7 Environment. Washington, DC. May.
- 8 Fresno County. 1978. Chapter 8.40 – Noise Control, in *Fresno County Municipal Code*.
- 9 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
10 *Update*. October 3.
- 11 Harris, C.M. (ed.). 1991. *The Handbook of Acoustical Measurements and Noise Control*,
12 *Third Edition*, McGraw-Hill Book Co., New York.
- 13 Madera County. 1995. Noise Element, in *Madera County General Plan Policy*
14 *Document*. October 24.
- 15 Reherman, C.N, J.L. Rochat, E.S. Thalheimer, M.C. Lau, G.G. Fleming, M. Ferroni, and
16 C. Corbisier. 2006. *Federal Highway Administration Road Construction Noise*
17 *Model User's Guide*. U.S. Department of Transportation, Federal Highway
18 Administration. FHWA-HEP-05-054. DOT-VNTSC-FHWA-05-01. Cambridge,
19 MA. January.
- 20 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
21 *Restoration Program, Program Environmental Impact Statement/Report*. April.
22 SCH # 2007081125.
- 23 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2012.
24 *Reclamation's NEPA Handbook*. February 2012.

25 **28.18 Chapter 18 – Paleontological Resources**

- 26 Bartow, J.A. 1991. *The Cenozoic Evolution of the San Joaquin Valley, California*. U.S.
27 Geological Survey Professional Paper 1501. 40 pp.
- 28 Dundas, R.G., R.B. Smith, and K.L. Verosub 1996. *The Fairmead Landfill Locality*
29 *(Pleistocene, Irvingtonian), Madera County, California: preliminary report and*
30 *significance*. PaleoBios, Volume 17, Number 2-4, Pages 50-58, September 13.
- 31 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
32 *Update*. October 3.

- 1 Jefferson, G.T. 1991a. *A Catalogue of Late Quaternary Vertebrates from California:*
2 *Part One, Nonmarine Lower Vertebrate and Avian Taxa.* Natural History
3 Museum of Los Angeles County. Technical Reports, Number 5.
- 4 Jefferson, G.T. 1991b. *A Catalogue of Late Quaternary Vertebrates from California:*
5 *Part Two, Mammals.* Natural History Museum of Los Angeles County. Technical
6 Reports, Number 7.
- 7 Jennings, C.W., and R.G. Strand. 1958. Geologic map of California, Olaf P. Jenkins
8 edition, Santa Cruz sheet, scale 1:250,000.
- 9 Madera County. 1995. *Madera County General Plan Policy Document.* October 24.
- 10 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
11 *Restoration Program, Program Environmental Impact Statement/Report.* April.
12 SCH # 2007081125.
- 13 Savage, D.E., 1951. *Late Cenozoic Vertebrates of the San Francisco Bay Region.*
14 University of California Publications, Bulletin of the Department of Geological
15 Sciences. Vol. 28, No. 10, pp. 215-314.
- 16 Society of Vertebrate Paleontology (SVP). 1995. Assessment and Mitigation of Adverse
17 Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines. Society
18 of Vertebrate Paleontology News Bulletin 163:22–27.
- 19 Society of Vertebrate Paleontology (SVP). 2010. *Standard Procedures for the*
20 *Assessment and Mitigation of Adverse Impacts to Paleontological Resources.*
21 Society of Vertebrate Paleontology Impact Mitigation Guidelines Revision
22 Committee.
- 23 Stirton, R. A., 1951. “Prehistoric Land Animals of the San Francisco Bay Region,” in
24 O.P. Jenkins (ed.), *Geologic Guidebook of the San Francisco Bay Communities,*
25 *History, Landscape, Geology, Fossils, Minerals, Industry, and Route to Travel.*
26 California Division of Mines. Bulletin 154, pp. 177-186. December.
- 27 University of California Museum of Paleontology (UCMP). 2013. Online Database.
28 Available: <<http://ucmpdb.berkeley.edu>>. Accessed March 2013. Last accessed
29 May 2015.

30 **28.19 Chapter 19 – Public Health and Hazardous Materials**

- 31 California Department of Conservation, Division of Oil, Gas, and Geothermal Resources
32 (DOGGR). 2012. “Well Permitting.” Available:
33 <http://www.conservation.ca.gov/dog/Pages/WellPermitting.aspx#p_a>.
34 Accessed July 2013. Last accessed March 2015.

- 1 California Department of Forestry and Fire Protection (CAL FIRE). 2007a. *Fresno*
 2 *County Draft Fire Hazard Severity Zone Map in Local Responsibility Areas*. Fire
 3 and Resource Assessment Program. October 2. Available:
 4 <http://frap.cdf.ca.gov/webdata/maps/fresno/fhszl06_1_map.10.pdf>. Accessed
 5 July 2013. Last accessed March 2015.
- 6 California Department of Forestry and Fire Protection (CAL FIRE) 2007b. *Madera*
 7 *County Draft Fire Hazard Severity Zone Map in Local Responsibility Areas*. Fire
 8 and Resource Assessment Program. September 20. Available:
 9 <http://frap.cdf.ca.gov/webdata/maps/madera/fhszl06_1_map.20.pdf>. Accessed
 10 July 2013. Last accessed March 2015.
- 11 California Department of Public Health (CDPH). 2009a. Epidemiologic Summary of
 12 Hantavirus Pulmonary Syndrome (HPS) in California, 2001 – 2008, in
 13 *Epidemiologic Summaries of Selected General Communicable Diseases in*
 14 *California 2001-2008*. Page 33-34. Available:
 15 <[http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-](http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-2008-083111.pdf)
 16 [2008-083111.pdf](http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-2008-083111.pdf)>. Accessed July 2013. Last accessed March 2015.
- 17 California Department of Public Health (CDPH). 2009b. Epidemiologic Summary of
 18 Coccidioidomycosis in California 2001-2008, in *Epidemiologic Summaries of*
 19 *Selected Communicable Diseases in California*. Pages 17-19. Available:
 20 <[http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-](http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-2008-083111.pdf)
 21 [2008-083111.pdf](http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-2008-083111.pdf)>. Accessed July 2013. Last accessed March 2015.
- 22 California Department of Public Health (CDPH). 2010. Epidemiologic Summary of West
 23 Nile Virus in California, 2001 – 2008, in *Epidemiologic Summaries of Selected*
 24 *General Communicable Diseases in California 2001-2008*. Page 75-77.
 25 Available: <[http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-](http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-2008-083111.pdf)
 26 [CA-2001-2008-083111.pdf](http://www.cdph.ca.gov/programs/sss/Documents/Epi-Summaries-CA-2001-2008-083111.pdf)>. Accessed July 2013. Last accessed March 2015.
- 27 California Department of Toxic Substances Control (DTSC). 2010. *Universal Waste Fact*
 28 *Sheet*. January. Available:
 29 <http://www.dtsc.ca.gov/HazardousWaste/UniversalWaste/upload/UW_Factsheet
 30 [1.pdf](http://www.dtsc.ca.gov/HazardousWaste/UniversalWaste/upload/UW_Factsheet)>. Accessed July 2013. Last accessed March 2015.
- 31 California Department of Toxic Substances Control (DTSC). 2015. Hazardous Waste
 32 Tracking System Database. Available: <<http://www.hwts.dtsc.ca.gov/>>. Accessed
 33 March 2015.
- 34 California Department of Water Resources (DWR). 2013. *Water Well Standards*.
 35 Available:
 36 <http://www.water.ca.gov/groundwater/well_info_and_other/california_well_standards/wws/wws_combined_sec23.html>. Accessed July 2013. Last accessed
 37 March 2015.
 38
- 39 DWR. *See* California Department of Water Resources.

- 1 EPA. *See* U.S. Environmental Protection Agency.
- 2 Federal Aviation Administration (FAA). 2013. “William Robert Johnston Muni.”
3 Available:
4 <<https://nfdc.faa.gov/nfdcApps/airportLookup/airportDisplay.jsp?airportId=M90>>
5 Accessed July 2013. Last accessed April 2015.
- 6 Firebaugh Las Deltas Unified School District. 2013. “FLDUSD Schools.” Available:
7 <<http://www.fldusd.org/schools>>. Last accessed April 2015.
- 8 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
9 *Update*. October 3.
- 10 Fresno County Office of Emergency Services (Fresno County OES). 2013. “About
11 Fresno County Office of Emergency Services.” Available:
12 <<http://www.co.fresno.ca.us/DivisionPage.aspx?id=31561>>. Accessed July 2013.
13 Last accessed April 2015.
- 14 Fresno County Fire Protection District. 2012. “Mendota, Battalion 15.” Available:
15 <<http://www.fresnocountyfire.org/index.php?c=15>>. Accessed July 2013. Last
16 accessed April 2015.
- 17 Madera County. 1995. *Madera County General Plan Policy Document*. October 24.
- 18 Madera County Office of Emergency Services (Madera County OES). 2010. *Madera*
19 *County Operational Area Emergency Operations Plan*. January.
- 20 Madera County Fire Department. 2012. Madera County Fire Stations. Available:
21 <[http://www.madera-county.com/index.php/departments/links-to-](http://www.madera-county.com/index.php/departments/links-to-departments/141-fire-department)
22 [departments/141-fire-department](http://www.madera-county.com/index.php/departments/links-to-departments/141-fire-department)>. Accessed July 2013. Last accessed April
23 2015.
- 24 Mendota Unified School District. 2013. “Mendota Unified School District Maps.”
25 Available: <<http://www.musdaztecs.com/apps/maps/>>. Accessed July 2013. Last
26 accessed April 2015.
- 27 Office of Emergency Services (OES). 2013. *State of California Multi-Hazard Mitigation*
28 *Plan*. California Governor’s Office of Emergency Services. October.
- 29 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
30 *Restoration Program, Program Environmental Impact Statement/Report*. April.
31 SCH # 2007081125.
- 32 SJRRP. *See* San Joaquin River Restoration Program.
- 33 State Water Resources Control Board. 2012. *California Underground Storage Tank*
34 *Regulations*. Title 23, California Code of Regulations, Chapter 16. July 1.

1 Available: <http://www.swrcb.ca.gov/ust/regulatory/docs/title23_d3_c16.pdf>.
2 Accessed July 2013. Last accessed March 2015.

3 **28.20 Chapter 20 – Recreation**

4 American Whitewater Association 2012. “San Joaquin - Mendota to Merced River
5 Confluence.” Available:
6 <http://www.americanwhitewater.org/content/River_detail_id_5090>. Accessed
7 November 2012. Last accessed August 2014.

8 Blumenshine, S., L. Castro, M.A. Grill, and M. Somma. 2012. *San Joaquin River*
9 *Recreation Study*. Final Report. California State University, Fresno. November
10 30. 44 pp.

11 California Department of Fish and Wildlife (DFW). 2013a. *Summary: San Joaquin River*
12 *Recreational Impact Study*. October 15.

13 California Department of Fish and Wildlife (DFW). 2013b. *2013-2014 Freshwater Sport*
14 *Fishing Regulations*. Effective March 1, 2013 – February 28, 2014. License and
15 Revenue Branch.

16 California State Lands Commission (CSLC). 2011. *Preliminary Record of Survey –*
17 *Administrative Map of the San Joaquin River, Reach 2B – From the Chowchilla*
18 *Bifurcation Structure to the Mendota Dam – Portions of Sections 16, 17, 19, 20,*
19 *21, 22, 23, 25, 26, 27, & 36 – Township 13 South, Range 15 East, M.D.M. –*
20 *Fresno & Madera Counties, California.*

21 City of Mendota. 2009. *City of Mendota General Plan Update 2005-2025*. Adopted
22 August 11.

23 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
24 *Update*. October 3.

25 Madera County. 1995. *Madera County General Plan Policy Document*. October 24.

26 Spada, pers. comm. 2011a. Personal communication from Tony Spada, Warden,
27 California Department of Fish and Wildlife, with Steve Pavich, Cardno ENTRIX.
28 December 27, 2011.

29 Spada, pers. comm. 2011b. Personal communication from Tony Spada, Warden,
30 California Department of Fish and Wildlife, with Steve Pavich, Cardno ENTRIX.
31 December 15, 2011.

32 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
33 *Restoration Program, Program Environmental Impact Statement/Report*. April.
34 SCH # 2007081125.

1 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2007.
2 *Conveyance of Refuge Water Supply, South San Joaquin Valley Study Area,*
3 *Mendota Wildlife Area, Draft Environmental Assessment – Initial Study.* May.

4 U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2012. *San*
5 *Joaquin River Restoration Program Record of Decision.* September 28.

6 **28.21 Chapter 21 – Socioeconomics and Economics**

7 Bertaut C., and L. Pounder 2009. The Financial Crisis and U.S. Cross-Border Financial
8 Flows, in *Federal Reserve Bulletin*. Page A147 – A167. Available:
9 <[http://www.federalreserve.gov/pubs/bulletin/2009/pdf/bulletin_article_november](http://www.federalreserve.gov/pubs/bulletin/2009/pdf/bulletin_article_november_2009a1.pdf)
10 [_2009a1.pdf](http://www.federalreserve.gov/pubs/bulletin/2009/pdf/bulletin_article_november_2009a1.pdf)>. Accessed January 2013. Last accessed August 2014.

11 California Department of Finance. 2007. E-4 Revised Historical City, County and State
12 Population Estimates 1991-2000, with 1990 and 2000 Census Counts. Available:
13 <[http://www.dof.ca.gov/research/demographic/reports/estimates/e-4/1991-](http://www.dof.ca.gov/research/demographic/reports/estimates/e-4/1991-2000/)
14 [2000/](http://www.dof.ca.gov/research/demographic/reports/estimates/e-4/1991-2000/)>. Accessed January 2013. Last accessed August 2014.

15 California Department of Food and Agriculture (CDFA). 2012. “Agricultural Statistical
16 Overview,” in *California Agricultural Statistics Review 2012-2013*. CDFA
17 Agricultural Resource Reports.

18 California Department of Water Resources (DWR). 2010. *2010 Local Maintaining*
19 *Agency Annual Report for Levees of the State Plan of Flood Control*. California
20 Water Code Sections 9140-9141. Flood Project Integrity and Inspection Branch.

21 California Department of Water Resources (DWR). 2011. *2011 Local Maintaining*
22 *Agency Annual Report for Levees of the State Plan of Flood Control*. California
23 Water Code Sections 9140-9141. Flood Project Integrity and Inspection Branch.

24 California Department of Water Resources (DWR). 2012. Appendix B, San Joaquin
25 River Individual Agency Summary Reports, in *2012 Inspection and Local*
26 *Maintaining Agency Report of the Central Valley State-Federal Flood Protection*
27 *System*.

28 California Department of Water Resources (DWR). 2013. *2013 Inspection and Local*
29 *Maintaining Agency Report of the Central Valley State-Federal Flood Projection*
30 *System*. Code of Federal Regulations, Title 33, Section 208.10. California Water
31 Code Sections 9140-9141. Flood Project Integrity and Inspection Branch.

32 California Employment Development Department (EDD). 2013a. Labor Force &
33 Unemployment and Employment by Industry Data. Labor Market Information for
34 Fresno County, Madera County, and California.

- 1 California Employment Development Department (EDD). 2013b. 2010-2020
2 Occupational Employment Projections Fresno Metropolitan Statistical Area
3 (Fresno County). Labor Market Information Division. February 26.
- 4 California Employment Development Department (EDD). 2013c. 2008-2018
5 Occupational Employment Projections. Madera-Chowchilla Metropolitan
6 Statistical Area (Madera County). Labor Market Information Division.
- 7 California State Controller. 2003. *Counties Annual Report – Fiscal Year 2000-01*. Office
8 of the State Controller, June 25.
- 9 California State Controller. 2008. *Counties Annual Report – Fiscal Year 2005-06*. Office
10 of the State Controller, March 3.
- 11 California State Controller. 2012. *Counties Annual Report – Fiscal Year 2010-11*. Office
12 of the State Controller, August 1.
- 13 EDD. *See* California Employment Development Department.
- 14 Fresno County Department of Agriculture. 2011. *2011 Fresno County Agricultural Crop
15 and Livestock Report*. Fresno County Agricultural Commissioner/Sealer.
- 16 Madera County Department of Agriculture. 2001-2011 Agricultural Crop Reports.
17 Madera County Agricultural Commissioner/Sealer.
18 *2001 Agricultural Crop Report*.
19 *2002 Agricultural Crop Report*.
20 *2003 Agricultural Crop Report*.
21 *2004 Agricultural Crop Report*.
22 *2005 Agricultural Crop Report*.
23 *2006 Agricultural Crop Report*.
24 *2007 Agricultural Crop Report*.
25 *2008 Agricultural Crop Report*.
26 *2009 Agricultural Crop Report*.
27 *2010 Agricultural Crop Report*.
28 *2011 Agricultural Crop Report*.
- 29 Merced County Local Agency Formation Commission. 2009. *County of Merced, Special
30 Service Districts, Municipal Service Review*. Prepared by Economic and Planning
31 Systems, Inc. June 25.
- 32 San Joaquin River Flood Control Project Agency. 2013. *Upper San Joaquin River
33 Regional Flood Management Plan, Regional Setting and Flood Hazard
34 Assessment*. Draft. June 19.
- 35 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River
36 Restoration Program, Program Environmental Impact Statement/Report*. April.
37 SCH # 2007081125.

- 1 San Joaquin River Restoration Program (SJRRP). 2013. *Final Fiscal Year 2013 Annual*
2 *Work Plan*. July.
- 3 SJRRP. *See* San Joaquin River Restoration Program.
- 4 U.S. Department of Agriculture National Agricultural Statistics Service. 2005. *2004*
5 *County Agricultural Commissioners' Data*. October.
- 6 U.S. Department of Agriculture National Agricultural Statistics Service. 2006. *California*
7 *County Agricultural Commissioners' Data, 2005*. August.
- 8 U.S. Department of Agriculture National Agricultural Statistics Service. 2007. *California*
9 *County Agricultural Commissioners' Data, 2006*. September.
- 10 U.S. Department of Agriculture National Agricultural Statistics Service. 2008. *California*
11 *County Agricultural Commissioners' Data, 2007*. August 29.
- 12 U.S. Department of Agriculture National Agricultural Statistics Service. 2009. *California*
13 *County Agricultural Commissioners' Data, 2008*. October 15.
- 14 U.S. Census Bureau. 1990. 1990 Decennial Census of Population – Summary File 1
15 (SF1) and Summary File 3 (SF3) Datasets. Available: <www.census.gov>. Last
16 accessed August 2014.
- 17 U.S. Census Bureau. 2000. 2000 Decennial Census of Population – Summary File 1
18 (SF1) and Summary File 3 (SF3) Datasets. Available: <www.census.gov>. Last
19 accessed August 2014.
- 20 U.S. Census Bureau. 2010. Profile of General Population and Housing Characteristics:
21 2010. 2010 Census Summary File 1. American FactFinder.

22 **28.22 Chapter 22 – Transportation and Traffic**

- 23 Bitner, pers. comm., 2013. E-mail correspondence from Mr. Mike Bitner, Principal
24 Transportation Planner, Fresno COG with Noel Casil, URS.
- 25 California Department of Transportation (Caltrans). 2008a. *Right of Way Manual*.
26 Available: <<http://www.dot.ca.gov/hq/row/rowman/manual/index.htm>>. Last
27 accessed April 2015.
- 28 California Department of Transportation (Caltrans). 2008b. Chapter 17 - Encroachments
29 in Caltrans' Right of Way, in *Project Development Procedures Manual*.
30 Available: <http://www.dot.ca.gov/hq/oppd/pdpm/chap_pdf/chapt17.pdf>. Last
31 accessed April 2015.

- 1 California Department of Transportation (Caltrans). 2013. Annual average daily traffic
2 volumes. Operational Traffic Data Branch. Available: <[http://traffic-](http://traffic-counts.dot.ca.gov)
3 [counts.dot.ca.gov](http://traffic-counts.dot.ca.gov)>. Last accessed April 2015.
- 4 Florida Department of Transportation. 2009. Table 9, Generalized Peak Hour Directional
5 Volumes for Florida's Rural Undeveloped Areas and Cities or Developed Areas
6 with Less than 5,000 Population, in *2009 Quality/Level of Service Handbook*.
7 Systems Planning Office.
- 8 Fresno Council of Governments (Fresno COG). 2010. *2011 Regional Transportation*
9 *Plan, Long-Range Transportation Vision for the Fresno County Region for the*
10 *Years 2010 to 2035*. July 29.
- 11 Fresno County Fire Protection District (FCFPD) 2007. *Fire District Master Plan*.
12 February.
- 13 Keenan, pers. comm., 2013. E-mail correspondence from Deborah Keenan, Fire
14 Marshall/Director, Fire Prevention for Land Development, Madera County
15 Resource Management Agency, with John Chamberlain, URS. March 14.
- 16 Transportation Research Board. 2000. *Highway Capacity Manual 2000*. National
17 Resource Council, Washington, DC.
- 18 Madera County Transportation Commission. 2010. *Madera County 2011 Regional*
19 *Transportation Plan*. July 21.
- 20 McCarthy, K. 2004. *Laws, Regulations, and Policies on Placing Utilities in State*
21 *Highway Rights-of-Way*. 2004-R-0161. March 17.
- 22 Winning, pers. comm., 2013. E-mail correspondence from Mr. Derek Winning, Deputy
23 Executive Director, Madera County Transportation Commission, with Noel Casil,
24 URS.

25 **28.23 Chapter 23 – Utilities and Service Systems**

- 26 California Energy Commission (CEC). 2011a. *Renewable Energy Program 2011 Annual*
27 *Report to the Legislature*. Draft Committee Report. CEC-300-2011-007-CTD.
28 November.
- 29 California Energy Commission (CEC). 2011b. “Natural Gas Supply by Region.”
30 Available: <http://energyalmanac.ca.gov/naturalgas/natural_gas_supply.html>.
31 Accessed July 2013.
- 32 California Energy Commission (CEC). 2011c. “California Natural Gas Demand By
33 Sector 2006.” Available:
34 <http://energyalmanac.ca.gov/naturalgas/demand_by_sector.html>. Accessed July
35 2013.

- 1 California Energy Commission (CEC). 2013a. "Total Electricity System Power." Energy
2 Almanac. Available:
3 <[http://energyalmanac.ca.gov/electricity/system_power/2010_total_system_powe](http://energyalmanac.ca.gov/electricity/system_power/2010_total_system_power.html)
4 r.html>. Accessed March 10, 2013. Last accessed February 2015.
- 5 California Energy Commission (CEC). 2013b. "Oil Supply Sources to California
6 Refineries." Energy Almanac. Last updated March 11, 2011. Available:
7 <http://energyalmanac.ca.gov/petroleum/statistics/crude_oil_receipts.html>.
8 Accessed March 2013. Last accessed February 2015.
- 9 California Energy Commission (CEC). 2015. *2014 Integrated Energy Policy Report*
10 *Update*. CEC-100-2014-001. January.
- 11 California Highway Patrol (CHP). 2013. "CHP Central Division - Central Division Quick
12 Facts." Available: <http://www.chp.ca.gov/depts_divs_offs/401.html>. Accessed
13 March 2013. Last accessed February 2015.
- 14 California Public Utilities Commission. 2009. *Gill Ranch Gas Storage Project Initial*
15 *Study/Mitigated Negative Declaration*. Final. Prepared by RMT Inc. September.
- 16 California Department of Resources, Recycling, and Reuse (CalRecycle). 2011a.
17 "Facility/Site Summary Details: American Avenue Disposal Site (10-AA-0009)."
18 Available: <[http://www.calrecycle.ca.gov/SWFacilities/Directory/10-AA-](http://www.calrecycle.ca.gov/SWFacilities/Directory/10-AA-0009/Detail/)
19 0009/Detail/>. Accessed September 2011. Last accessed February 2015.
- 20 California Department of Resources, Recycling, and Reuse (CalRecycle). 2011b.
21 "Facility/Site Summary Details: Fairmead Solid Waste Disposal Site (20-AA-
22 0002)."
23 Available: <[http://www.calrecycle.ca.gov/SWFacilities/Directory/20-AA-](http://www.calrecycle.ca.gov/SWFacilities/Directory/20-AA-0002/Detail/)
24 0002/Detail/>. Accessed September 2011. Last accessed February 2015.
- 24 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan*
25 *Update*. October 3.
- 26 Fresno County. 2007. Resource Guide for the Disposal of Construction and Demolition
27 Debris, in *Turning It Around 2013, Your Guide to Recycling Options and Services*
28 *in Fresno County*. August.
- 29 Fresno County. 2011. "About Us." Fresno County Fire Protection District. Available:
30 <<http://www.fresnocountyfire.org/index.php?c=2>>. Accessed September 2011.
31 Last accessed February 2015.
- 32 Fresno County Fire Protection District (FCFPD) 2009. "Operations Division." Fresno
33 County Fire Protection District Operations Bureau. Available:
34 <<http://fresnocountyfire.org/OperationsBureau-i-26-26-s-main.html>>. Last
35 accessed February 2015.
- 36 Fresno Irrigation District, City of Clovis, Fresno Metropolitan Flood Control District,
37 Fresno County, City of Fresno, City of Kerman, Bakman Water Company,

- 1 Garfield Water District, Malaga County Water District, and Pindale County Water
2 District. 2006. *Fresno Area Regional Groundwater Management Plan*. December.
- 3 Madera County. 1995. *Madera County General Plan Background Report*. October 24.
- 4 Madera County. 2002. *AB3030 Groundwater Management Plan*. Madera County.
5 January.
- 6 Madera County. 2008a. *Fire Department Planning Study for Madera County, CA*.
7 Prepared by Citygate Associates, LLC. September 17.
- 8 Madera County. 2008b. *Integrated Regional Water Management Plan*. April.
- 9 Madera County. 2013. “Solid Waste Management.” Available: <[http://www.madera-
10 county.com/index.php/solid-waste-management](http://www.madera-county.com/index.php/solid-waste-management)>. Accessed March 2013. Last
11 accessed February 2015.
- 12 Pacific Gas and Electric Company (PG&E). 2009. *2008 Corporate Responsibility Report*.
- 13 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River
14 Restoration Program, Program Environmental Impact Statement/Report*. April.
15 SCH # 2007081125.
- 16 Underground Service Alert North. 2013. “USA North History.” Available:
17 <<http://www.usanorth.org/USANabout.html>>. Accessed March 2013. Last
18 accessed February 2015.

19 **28.24 Chapter 24 – Visual Resources**

- 20 FHWA. See U.S. Department of Transportation, Federal Highway Administration.
- 21 Fresno County. 2000. *Fresno County General Plan Policy Document – General Plan
22 Update*. October 3.
- 23 Madera County. 1995. *Madera County General Plan Policy Document*. October 24.
- 24 San Joaquin River Restoration Program (SJRRP). 2011a. *Mendota Dam Sluice Gates
25 Replacement Project, Final Environmental Assessment/Finding of No Significant
26 Impact*. December.
- 27 San Joaquin River Restoration Program (SJRRP). 2011b. *Draft San Joaquin River
28 Restoration Program, Program Environmental Impact Statement/Report*. April.
29 SCH # 2007081125.
- 30 U.S. Department of Agriculture, U.S. Forest Service (USFS). 1974. Chapter 1. The
31 Visual Management System, in *National Forest Landscape Management*. Volume
32 2., Agriculture Handbook No. 462. Washington, D.C. April.

- 1 U.S. Department of Agriculture, U.S. Forest Service (USFS). 1995. *Landscape*
2 *Aesthetics, A Handbook for Scenery Management*. Agricultural Handbook
3 Number 701. Washington, D.C. December.
- 4 U.S. Department of Interior, Bureau of Land Management (BLM). 1984. *Manual 8400,*
5 *Visual Resource Management*. Washington, D.C. April 5.
- 6 U.S. Department of Transportation, Federal Highway Administration (FHWA). 1981.
7 *Visual Impact Assessment for Highway Projects*. Publication No. FHWA-HI-88-
8 054. Office of Environmental Policy. Washington, D.C.

9 **28.25 Chapter 25 – Cumulative Impacts**

- 10 Council on Environmental Quality Guidance (CEQ). 1997. *Considering Cumulative*
11 *Effects under the National Environmental Policy Act*.
- 12 Council on Environmental Quality Guidance (CEQ). 2005. *Guidance on the*
13 *Consideration of Past Actions in Cumulative Effects Analysis*. Memorandum from
14 J.L. Connaughton, Chairman, to Heads of Federal Agencies. June 24.
- 15 California Department of Conservation (DOC). 2013. Farmland Conversion Reports,
16 Fresno County and Madera County. Available:
17 <<http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx>
18 x>. Last accessed April 2015.
- 19 San Joaquin River Partnership. 2011. *San Joaquin River Blueway: A Vision for Public*
20 *Enjoyment and Stewardship of the San Joaquin River*.
- 21 San Joaquin River Restoration Program (SJRRP). 2011. *Draft San Joaquin River*
22 *Restoration Program, Program Environmental Impact Statement/Report*. April.
23 SCH # 2007081125.
- 24 U.S. Army Corps of Engineers (Corps). 2014. *Guidelines for Landscape Planting and*
25 *Vegetation Management at Levees, Floodwalls, Embankment Dams, and*
26 *Appurtenant Structures*. Engineer Manual 1110-2-583. Engineering and Design.
27 April 30.

28 **28.26 Chapter 26 – Other NEPA and CEQA Considerations**

- 29 Kohler, S. 2006. *California Non-Fuel Minerals 2006*. California Geological Survey.
- 30 California Case Law. 2001. *Napa Citizens for Honest Government v. Napa County Board*
31 *of Supervisors*. 91 Cal. App. 4th 342, 367–371 (110 Cal. Rptr. 2d 579).

1 **28.27 Chapter 27 – Consultation, Coordination, and**
 2 **Compliance**

- 3 California Department of Transportation (Caltrans). 2013a. *Highway Design Manual*.
 4 June. Available: <<http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm>>. Accessed
 5 September 2014. Last accessed April 2015.
- 6 California Department of Transportation (Caltrans). 2013b. *Encroachment Permits*
 7 *Manual*. July. Available:
 8 <[http://www.dot.ca.gov/hq/traffops/developserv/permits/encroachment_permits_](http://www.dot.ca.gov/hq/traffops/developserv/permits/encroachment_permits_manual/)
 9 [manual/](http://www.dot.ca.gov/hq/traffops/developserv/permits/encroachment_permits_manual/)>. Last accessed May 2015.
- 10 Central Valley Regional Water Quality Control Board (RWQCB). 2011. *Water Quality*
 11 *Control Plan (Basin Plan) for the Sacramento River Basin and San Joaquin River*
 12 *Basin*. Fourth Edition. Revised October 2011 with approved amendments.
- 13 Federal Transit Administration (FTA). 2006. *Transit Noise and Vibration Impact*
 14 *Assessment*. Report No. FTA-VA-90-1003-06. Office of Planning and
 15 Environment. Washington, DC. May.
- 16 San Joaquin River Restoration Program (SJRRP). 2010. *Mendota Pool Bypass and Reach*
 17 *2B Improvements Project Public Scoping Report*. February.
- 18 San Joaquin River Restoration Program (SJRRP). 2011a. *Draft San Joaquin River*
 19 *Restoration Program, Program Environmental Impact Statement/Report*. April.
 20 SCH # 2007081125.
- 21 San Joaquin River Restoration Program (SJRRP). 2011b. *Mendota Pool Bypass and*
 22 *Reach 2B Project Technical Memorandum on Regulatory Compliance*. July.
- 23 San Joaquin River Restoration Program (SJRRP). 2012a. *Final Program Environmental*
 24 *Impact Statement/Report*. SJRRP. July.
- 25 San Joaquin River Restoration Program (SJRRP). 2012b. *San Joaquin River Restoration*
 26 *Program Record of Decision*. September 28.
- 27 U.S. Army Corps of Engineers (Corps). 2008. *A Field Guide to the Identification of the*
 28 *Ordinary High Water Mark (OHWM) in the Arid West Region of the Western*
 29 *United States, A Delineation Manual*. Prepared by Lichvar, Robert W., and
 30 Shawn M. McColley. Engineering Research and Development Center/Cold
 31 Regions Research and Engineering Laboratory TR-08-12. August.

1 29.0 List of Preparers

Name	Qualifications	Background/Expertise	Participation
Lead NEPA Agency: U.S. Department of the Interior, Bureau of Reclamation			
Alicia Forsythe	B.S., Hydrologic Sciences; B.S., Environmental Studies 14 years experience	Water Resources Planning and Environmental Compliance	Program Manager
Katrina Harrison	B.S., Civil and Environmental Engineering; Registered Civil Engineer 6 years experience	Hydrology and Hydraulics, Stream Restoration	Program Engineer
Becky Victorine	B.S., Agricultural Systems and the Environment 17 years experience	Environmental Permitting and Regulatory Compliance	Program Natural Resources Specialist
Michelle Banonis	B.S., Environmental Engineering 15 years experience	Environmental Permitting and Regulatory Compliance	Program Natural Resources Specialist (former)
Blair Greimann	Ph.D., Hydraulic Engineering 16 years experience	River Mechanics, Stream Restoration	Conceptual and Quantitative Modeling
Elaina Gordon	B.S., Civil Engineering; M.S., Civil Engineering 10 years experience	River Mechanics, Riparian Vegetation	Conceptual and Quantitative Modeling
Michael Mitchener	B.S., Geology; M.S., Geology 18 years experience	Geology	Deputy Program Manager (former)
David Mooney	Ph.D., Hydraulic Engineering 16 years experience	River Mechanics, Stream Restoration, Design of Hydraulic Structures	Program Engineer (former)
Lead CEQA Agency: California State Lands Commission			
Christopher Huitt	B.S., Conservation Biology; M.S., Biological Sciences 20 years experience	Ecological Restoration and Environmental Regulatory Compliance	Senior Environmental Scientist
Shelli Haaf	B.A., English; J.D., Law 9 years experience	CEQA Compliance	Staff Counsel
Kelly Keen	B.S., Psychobiology; M.S., Marine Biodiversity and Conservation 12 years experience	Marine Wildlife Behavior/Ecology, Underwater Acoustics, Geophysical Surveys, Sea Level Rise	Environmental Scientist

San Joaquin River Restoration Program

Name	Qualifications	Background/Expertise	Participation
Implementing Agency: U.S. Department of the Interior, Fish and Wildlife Service			
Zackary Jackson	M.S., Fisheries Biology 11 years experience	Fisheries Biology and Management	Fisheries Management Planning
Mark Littlefield	B.S., Wildlife Biology 35 years experience	Environmental Permitting and Regulatory Compliance, Wildlife Biology	Environmental Compliance and Permitting Work Group; ESA Section 7 Consultation; Fish and Wildlife Coordination Act
Carl Mesick	Ph.D., Fisheries Biology 35 years experience	Fisheries Biology and Management	Conceptual and Quantitative Modeling
John Netto	B.S., Fisheries Management; M.S., Fisheries Management 15 years experience	Fisheries Biology and Management	Fisheries Management Planning
Andy Raabe	B.S., Biology; M.S., Biology 19 years experience	Fisheries Environmental Permitting and Regulatory Compliance, Wildlife Biology and Management	Environmental Compliance and Permitting Work Group; ESA Section 7 Consultation; Fish and Wildlife Coordination Act
Kimberly Webb	B.S., Fisheries and Wildlife Management 22 years experience	Fisheries Biology and Management	Fisheries Management Workgroup Lead
Implementing Agency: U.S. Department of Commerce, National Marine Fisheries Service			
Leslie Mirise	B.S., Wildlife, Fish, and Conservation Biology 14 years experience	Environmental Permitting and Regulatory Compliance, Fisheries Biology and Research	Environmental Compliance and Permitting Work Group; ESA Section 7 Consultation
Rhonda Reed	B.S., Wildlife and Fisheries Biology; M.S., Ecology 36 years experience	Fisheries Biology and Management; Riparian and Fish Habitat Restoration	Program Management; ESA Permitting and NEPA/CEQA Document Review
Jonathan Schram	B.S., Biology-Marine Sciences; M.E.M., Coastal Environmental Management 4 years experience	Fisheries Biology, Research and Management	Fisheries Management Workgroup Member (former)

Name	Qualifications	Background/Expertise	Participation
Erin Strange	B.S., Environmental Biology and Zoology 21 years experience	Fisheries Biology, Research and Management	Fishery Management Workgroup Lead, Assistant Program Manager
Implementing Agency: California Department of Water Resources			
Paul Romero	B.S., Civil Engineering; Registered Civil Engineer 27 years experience	Hydraulics and Flood Management	DWR SJRRP Program Manager
Karen Dulik	M.S., Soil Science 16 years experience	Biological Studies and Environmental Compliance and Permitting	Environmental Compliance
Dave Encinas	B.S., Civil Engineering; Registered Civil Engineer 22 years experience	Hydraulics, Sediment Transport, River Restoration Design and Engineering, Fisheries Habitat Enhancement, Water Resources, Project Management	Alternatives Development & Design
Greg Farley	B.S., Civil Engineering; Registered Civil Engineer 33 years experience	Hydraulics and Flood Management	Alternatives Development & Design
Kevin J. Faulkenberry, PE	B.S., Civil Engineering; B.S., Survey Engineering 25 years experience	River Restoration and Fisheries Habitat Enhancement	DWR SJRRP Program Manager (former)
Alexis Phillips-Dowell	B.S., Environmental Resource Engineering; Registered Civil Engineer 7 years experience	Hydraulic Engineering	Alternatives Development & Design
Implementing Agency: California Department of Fish and Wildlife			
Erica Meyers	B.S., Conservation Biology; M.S., Environmental Science and Management 8 years experience	Fisheries Biology, Hydrology, Aquatic Habitat	Senior Environmental Scientist
Benessa Espino	B.S., Environmental Biology and Management 5 years experience	Fisheries Biology, Hydrology, Aquatic Habitat	Environmental Scientist
Andy Shriver	B.S., Physical and Biological Sciences 6 years experience	Salmon Ecology, Fluvial Geomorphology	Environmental Scientist
Primary Consultant: AECOM (formerly URS)			
Seth Gentzler	B.S., Civil Engineering; M.S., Environmental Engineering; Registered Civil Engineer 19 years experience	Habitat Restoration Engineering, Hydrology and Hydraulics, Water Resources	Project Manager for Consultant Team

San Joaquin River Restoration Program

Name	Qualifications	Background/Expertise	Participation
Noel Casil	B.S., Civil Engineering; Registered Civil, Traffic and Professional Traffic Operations Engineer 32 years experience	Civil/Construction Engineering, Operations and Maintenance (O&M) Engineering, Transportation Planning, Traffic Engineering and Environmental Documentation and Compliance	Primary Author, Transportation and Traffic
John Chamberlain	B.S., Meteorology ; M.S., Environmental Studies 31 years experience	NEPA/CEQA Compliance, Alternatives and Feasibility Studies, Land Use and Infrastructure	Primary Author, Utilities and Service Systems
Florentina Craciun	M.A., Urban Planning 5 years experience	Environmental Planning and Permitting	Contributing Author, Visual Resources
Bonnie DeBerry	B.S., Natural Resources and Environmental Studies; MFS, Aquatic Chemistry 17 years experience	Water Quality	Primary Author, Surface Water Resources and Water Quality
Liz Elliott	B.A., Earth and Environmental Sciences; M.S., Hydrologic Sciences; Certified Hydrogeologist, Professional Geologist 16 years experience	Hydrogeology, Flow and Transport Modeling, Water Resources	Primary Author, Groundwater
Katrina Hardt-Holoch	BUS, Physical Geography; MURP, Urban and Regional Planning; American Institute of Certified Planners 14 years experience	NEPA and CEQA Compliance	Primary Author, Visual Resources
Robert Horwath	B.S., Geology and Mineralogy; M.S., Geology; Registered Environmental Assessor, Geologist 25 years experience	Environmental Risk Assessments, Paleontological Assessments, CEQA/NEPA Compliance	Primary Author, Paleontological Resources
David Joe	B.S., Civil and Environmental Engineering; M.S., Civil and Environmental Engineering. 3 years experience	Air Dispersion Modeling, Greenhouse Gas Emissions Modeling, Air Quality	Contributing Author, Climate Change and Greenhouse Gas Emissions
Shannon Leonard	B.S., Biological Systems Engineering 16 years experience	Stream Restoration Design, Hydrology and Hydraulics	Primary Author, Description of Alternatives
Tammy Lim	B.S., Wildlife Biology; M.A., Ecology 16 years experience	Plant, Wildlife, and Habitat Assessment, Biological Monitoring, Special Status Species Surveys	Contributing Author, Wildlife
Dean Martorana	M.A., Anthropology 11 years experience	Prehistoric Archaeology, Section 106 Compliance, CEQA/NEPA Compliance	Primary Author, Cultural Resources

Name	Qualifications	Background/Expertise	Participation
Ryan McMullan	B.A., Acoustics 6 years experience	Environmental Acoustics and Noise Analysis	Contributing Author, Noise and Vibration
Phillip Mineart	B.S., Environmental Resources Engineering; M.S., Civil Engineering; Registered Civil Engineer 27 years experience	Water Resources, Mathematical Modeling, Hydrology and Hydraulics	Primary Author, Flood Management, Contributing Author, Climate Change and Greenhouse Gas Emissions
Joe Morgan	B.S., Chemistry 42 years experience	Site Investigation & Remediation, RCRA/ Environmental Audits, Due Diligence Programs	Primary Author, Public Health and Hazardous Materials
Elizabeth Nielsen	B.S., Biology; M.S., Civil and Environmental Engineering; Registered Civil Engineer 12 years experience	Surface Water Contaminates, Environmental Restoration, Water Resources	Deputy EIR/S Task Lead, Contributing Author, Various Chapters
Jessica Parteno	B.S., Biology; Advanced Diploma, Geographic Information Systems 10 years experience	GIS, Botany, Ecology	GIS lead
Norm Ponferrada	B.S., Wildlife, Fish, and Conservation Biology 10 years experience	Habitat Restoration, Fisheries and Wildlife Biology and Physiology	Contributing Author, Fisheries
Ron Reeves	B.S., Information Systems 21 years experience	Source Noise Emissions, Sensitive Receiver Analysis, Noise Mitigation, Ground-borne Vibration Analysis, Potential Vibration Impacts	Primary Author, Noise and Vibration
Jennifer Schulte	B.S., Mathematics; B.S., Chemical Engineering; M.S., Chemical Engineering; Ph.D., Chemical Engineering 9 years experience	Air Quality, Health Risk Assessment, Climate Change, Emission Inventories, Air Dispersion Modeling, Greenhouse Gas Emissions, Emission Mitigation	Primary Author, Air Quality, Climate Change and Greenhouse Gas Emissions
David Simpson	B.S., Geology; M.S., Geology; California Professional Geologist 25 years experience	Geology, Soils, and Seismicity	Primary Author, Geology and Soils
Jon Stead	B.S., Ecology, Behavior, and Evolution; M.S., Ecology 15 years experience	Freshwater Ecology, Fish and Wildlife Biology, Special Status Species Surveys, Habitat Assessment	Primary Author, Wildlife, Contributing Author, Fisheries
George Strnad	M.S., Regional Planning and Landscape Architecture 30 years experience	Landscape Design, Habitat Restoration & Mitigation, Land Use Planning, Botanical Surveys, Wetland Delineation	Primary Author, Vegetation, Wetlands and Aquatic Resources

San Joaquin River Restoration Program

Name	Qualifications	Background/Expertise	Participation
Consultant: Cardno			
Susan Hootkins	MUP, Urban and Regional Planning 41 years experience	Environmental Planning, CEQA/NEPA Compliance, Socioeconomics	EIS/R Task Lead
Steve Pavich	B.A., Economics; M.S., Agricultural and Resource Economics 13 years experience	Socioeconomics, Resource Economics, Recreation, Land Use Planning	Primary Author, Land Use Planning and Agricultural Resources, Recreation, Socioeconomics and Economics, Environmental Justice
Tom Taylor	B.S. Biology; M.S. Aquatic Biology 36 years experience	Aquatic Ecology, Fishery Biology, Salmon Biology, Fish Passage, Aquatic Habitat Restoration	Primary Author, Fisheries
Consultant: TetraTech			
Bob Mussetter	B.S., Civil Engineering; M.S., Civil Engineering; Ph.D., Civil Engineering 32 years experience	Surface Water Hydrology, Hydraulic Analysis, Sediment Transport Modeling, River Mechanics, Fluvial Geomorphology	Contributing Author, Surface Water Resources and Water Quality

30.0 Index

This index is intended to provide a listing of key names, places, and topics to help the reader find information. The page numbers listed are for sections in the document where the item is the focus of discussion. For some entries, the first several page listings are followed by “various” to indicate that the topic is discussed at a number of points after the listed points of discussion.

- abandoned wells, 2-25, 2-105; 19-13;
19-25–19-26, 19-31, 19-33, 19-35;
26-32
- access, 22-3, 22-6, 22-7, various; 27-16
 - construction access, 2-25, 2-26;
7-31; 12-19; 16-21, 16-23; 17-19;
19-17, 19-19, 19-21, 19-24; 22-17;
26-3, 26-19, 26-26, 26-29–26-30,
26-38
 - public access, 7-22, 7-36; 8-2; 9-11,
9-17; 10-17, 10-21, 10-23; 15-9;
20-4, 20-6–20-7, 20-11–20-13,
20-16–20-18, various; 22-17; 24-2–
24-7, 24-10, 24-28–24-29; 25-10,
25-27; 27-23, 27-26, 27-38
- adverse soil conditions, 2-19; 11-25,
11-27, 11-29, 11-31–11-32, various;
26-16
- aggradation, 14-14, 14-33, 14-36, 14-43
- air quality, 1-12; Chapter 4, various;
22-8; 23-10; 25-12–25-15; 26-1;
27-11, 27-34–27-35
- agricultural emissions, 4-42, 4-48,
4-53, 4-58; 8-3; 26-10
- criteria pollutants, 4-17–4-18, 4-27,
4-29–4-30, various
- emission sources, 4-4, 4-6, 4-20,
4-29
- monitoring stations, 4-8–4-9
- operational emissions, 4-28, 4-30,
4-42–4-43, 4-48, various
- Regulation VIII, 2-102, 2-107; 4-23,
4-33, 4-45, various; 26-37; 27-25
- resident child, 4-40, 4-47, 4-52–4-53,
various; 26-3, 26-10–26-11
- school child, 4-40, 4-47, 4-52, 4-57;
26-3, 26-10–26-11
- total construction emissions, 4-33–
4-34, 4-45, 4-50, 4-55
- Alternative A description, 2-1, 2-13,
2-33, 2-34, 2-35, 2-43, 2-47, 2-54,
2-57, 2-64, 2-67, 2-68, 2-69, 2-72,
2-73, 2-74, 2-77, 2-80, 2-82, 2-84,
2-85; 4-32–4-33, 4-36–4-47, 4-50–
4-52, various; 5-22–5-28, 5-31–5-37;
6-22–6-29; 7-27–7-39; 8-18–8-21;
9-21–9-29; 10-15–10-17; 11-27–
11-30; 12-17–12-21; 13-19–13-25;
14-35–14-42; 15-11–15-15; 16-20–
16-28; 17-25–17-31; 18-9–18-10;
19-14–19-29; 20-11–20-16; 21-18–
21-25; 22-14–22-17; 23-21–23-27;
24-33–24-37; 26-14, 26-18
- Alternative B description, 2-1, 2-13,
2-47, 2-48, 2-49, 2-50, 2-54, 2-56,
2-62, 2-63, 2-64; 4-44–4-49; 5-28–
5-33; 6-29–6-34; 7-39–7-45; 8-19–
8-22; 9-29–9-30; 10-17–10-19;
11-30–11-32; 12-21–12-22; 13-25–
13-27; 14-43–14-46; 15-15–15-16;
16-28–16-33; 17-31–17-35; 18-11–
18-12; 19-29–19-31; 20-17–20-20;
21-25–21-27; 22-17–22-20; 23-27–
23-29; 24-38–24-39; 26-9, 26-14
- Alternative C description, 2-1, 2-13,
2-30, 2-63, 2-65, 2-66, 2-71, 2-76,
2-80, 2-81, 2-83, 2-84, 2-85; 4-49,

- 4-51-4-54; 5-33-5-37; 6-33-6-36;
7-45-7-51; 8-19-8-23; 9-30-9-31;
10-19-10-21; 11-32-11-34; 12-22-
12-23; 13-26-13-28; 14-46-14-50;
15-16-15-18; 16-33-16-37; 17-35-
17-41; 18-12; 19-31-19-34; 20-20-
20-24; 21-27-21-30; 22-21-22-23;
23-29-23-31; 24-39-24-43; 26-10,
26-14
- Alternative D description, 2-1, 2-13,
2-76, 2-78, 2-79, 2-82, 2-83, 2-84,
2-85; 4-54-4-59; 5-37-5-41; 6-36-
6-38; 7-51-7-57; 8-19-8-24; 9-31-
9-32; 10-21-10-23; 11-35-11-37;
12-23-12-24; 13-28-13-30; 14-50-
14-52; 15-18-15-19; 16-37-16-41;
17-41-17-45; 18-12-18-13; 19-34-
19-36; 20-24-20-27; 21-30-21-32;
22-24-22-26; 23-21-23-23; 24-43-
24-45; 26-9, 26-14
- aquatic habitat, 1-16, 1-17; 2-89, 2-90;
5-1-5-3; 7-6; 20-10, 20-15, 20-19;
20-22-20-23, 20-26; 25-14
- architectural resources, 9-12, 9-28, 9-31
- asbestos, 4-5; 19-2, 19-6, 19-12, 19-15-
19-18, 19-20-19-21; 23-5; 27-37
- bats. See special-status species
- bifurcation structure, 1-17, 1-18, 1-19;
2-9, 2-10, 2-13, 2-14, 2-16, 2-17,
2-21, 2-32, 2-33, 2-36, 2-37, 2-38,
2-45, 2-46, 2-47, 2-48, 2-49, 2-50,
2-51, 2-52, 2-53, 2-54, 2-56, 2-61,
2-62, 2-63, 2-64, 2-70, 2-75, 2-77,
2-80, 2-83, 2-108, 2-109, 2-111; 3-1,
3-2, 3-3; 4-32, 4-44, 4-49, 4-54; 5-1-
5-3, 5-22-5-31, 5-34-5-41; 6-22,
6-29, 6-36; 7-27, 7-30, 7-33, 7-35,
various; 8-22-8-23; 9-21, 9-29;
10-17; 11-11-11-12, 11-27, 11-29-
11-31, various; 12-3-12-4, 12-21,
12-23; 13-19, 13-25-13-26; 14-35-
14-36, 14-42, 14-50-14-51; 15-11,
15-15, 15-18; 17-15, 17-25, 17-31,
17-34, 17-41; 18-9, 18-11-18-12;
19-14, 19-29, 19-34; 20-11, 20-13-
20-15, 20-17-20-20, various; 22-14,
22-17, 22-20; 23-21-23-23, 23-27,
23-31; 24-33, 24-38, 24-43; 27-35,
27-37
- blunt-nosed leopard lizard. See special-
status species
- borrow material, 2-5, 2-19, 2-103; 4-32;
11-29, 11-31, 11-33, 11-35-11-36;
14-41; 18-9, 18-11-18-13; 20-7;
26-37; 27-27, 27-33
- burrowing owl. See special-status
species
- canals and drains. See infrastructure
- Central Valley steelhead. See special-
status species
- channel instability, 2-114; 14-31-14-34;
14-36-14-37, 14-43-14-44, 14-47-
14-48, 14-51
- Chinook salmon. See special-status
species
- Chowchilla Bifurcation Structure, 1-4,
1-7, 1-13, 1-15, 1-17, 1-18, 1-19;
3-1, 3-2, 3-3; 4-32, 4-44, 4-49, 4-54;
5-1-5-3, 5-5, 5-19-5-22, various;
6-2, 6-6, 6-22, 6-29, various; 7-27,
7-39, 7-45, 7-51; 8-18, 8-22-8-23;
9-21; 11-11-11-12; 12-3-12-5,
12-12, , 12-16, , 12-20-12-23; 13-19,
13-25, 13-26, 13-28; 14-1, 14-3-
14-5, 14-10, 14-14-14-15, various;
15-11, 15-15, 15-17, 15-18; 17-1,
17-5, 17-40; 18-9, 18-11, 18-12;
19-1, 19-23, 19-29, 19-32, 19-34;
20-10-20-11, 20-13-20-14, 20-17-
20-20, various; 22-1, 22-3; 23-21-
23-23, 23-27, 23-29, 23-31; 24-8,
24-10, 24-29, 24-33, 24-40, 24-43;
27-22
- conservation,
measures, 2-85, 2-87-2-99; 5-25-
5-26; 6-22-6-25, 6-28; 7-22, 7-26,
7-30-7-37, 7-41-7-44, various;
15-13-15-14; 16-14; 16-17-16-18,
24-29; 25-16-25-17, 25-23; 26-14,
26-17, 26-35; 27-14, 27-15, 27-20
strategy, 2-85-2-87; 4-25; 5-17-
5-18; 6-14-6-18, 6-20, 6-22, 6-29;

- 15-10–15-11, 16-10, 16-14, 24-28,
25-8–25-9, 25-16–25-17, 25-23;
26-14, 26-35–26-36; 27-14
- construction access. See access
- Construction Groundwater Management
Plan, 2-104; 13-21, 13-25, 13-28;
26-26
- designated farmland, 2-104; 16-6,
16-17–16-19, 16-22–16-26, 16-30–
16-32, various; 25-12; 26-2, 26-3,
26-6, 26-12, 26-15, 26-17, 26-27
- Delta smelt. See special-status species
- Drive 10 ½, 2-4, 2-33, 2-40, 2-48, 2-53,
2-106; 4-44; 6-29; 7-39; 8-22; 9-29;
10-17; 11-30; 13-25; 15-15; 17-5,
17-31, 18-11; 19-29; 20-13, 20-17;
22-14, 22-16–22-17, 22-19–22-21,
22-23, 22-26; 23-19, 23-21, 23-27,
23-29, 23-31; 24-38; 26-2, 26-3.
26-18, 26-33
- electric and gas distribution. See
infrastructure
- emergency response, 10-17; 12-10;
19-7–19-8, 19-10–19-11, 19-14,
19-29, 19-31, 19-34, 19-36; 22-9,
22-11, 22-14, 22-16–22-17, various;
23-4, 23-18–23-19, 23-21–23-22,
23-27, 23-29, 23-31; 25-12, 25-29–
25-30; 26-3–26-4, 26-18
- endangered species. See special-status
species
- erosion protection, 2-11, 2-20, 2-37;
11-28, 11-31, 11-34, 11-36; 14-37,
14-40, 14-44, 14-48; 26-16
- essential fish habitat, 2-98; 5-6; 26-36;
27-9–27-10
- fairly shrimp. See special-status species
- fall-run Chinook salmon. See special-
status species
- fish barrier, 1-4; 2-28, 2-30, 2-33, 2-40,
2-41, 2-43, 2-44, 2-56, 2-64, 2-68,
2-71, 2-77, 2-81, 2-82, 2-95, 2-112;
4-32, 4-49, 4-54; 5-30; 20-11–20-14
- fish habitat, 1-17; 2-9, 2-10, 2-16, 2-20,
2-42, 2-55, 2-70, 2-81, 2-98, 2-114;
5-6, 5-18, various; 27-9–27-10
- fish passage, 1-4, 1-14, 5-24; 22-26;
27-36
conditions, 5-16, various; 24-35;
26-10, 26-12
criteria, 2-18, 2-37, 2-53, 5-17, 5-25,
various
facilities, 1-4; 2-3, 2-16, 2-23, 2-32,
2-33, 2-36, 2-46, 2-48, 2-62, 2-63,
2-64, 2-68, 2-75, 2-77, 2-81, 4-32,
4-44, 4-49, 4-54; 5-16, 5-19–5-22,
5-27–5-32, various; 11-29–11-32,
11-35–11-36; 12-20–12-23; 13-25–
13-28; 14-42, 14-46–14-47, 14-50;
15-11–15-12; 20-7, 20-13–20-26;
23-21, 23-22, 23-26, 23-27, various;
24-20, 24-33, 24-38–24-40, 24-42–
24-43; 26-16
- fish screens, 2-10, 2-16, 2-18, 2-23,
2-28, 2-31, 2-32, 2-39, 2-40, 2-43,
2-54, 2-56, 2-72, 2-82, 2-109, 2-112;
4-49; 5-17, 5-22, 5-24, 5-25, various;
20-5, 20-18; 23-25; 24-33, 24-38,
24-39, 24-43; 27-36–27-37
- flood control operations, 9-8, 12-16
- flood flows, 1-15, 1-16, 1-17, 1-22;
2-41, 2-45, 2-61, 2-74, 2-83, 2-109,
2-112; 3-2, 3-4; 6-21–6-22, 6-27–
6-28; 9-28–9-29; 11-10; 12-3,
12-14–12-16; 14-4–14-7, 14-33,
14-35, 14-40–14-41; 16-19
- flood-proofed, floodproofing, 2-23,
2-25; 19-25; 23-30, 23-31, 23-32,
23-33
- Fresno kangaroo rat. See special-status
species
- Fresno Slough Dam, 2-1, 2-13, 2-28,
2-30, 2-63, 2-64, 2-65, 2-66, 2-67,
2-68, 2-69, 2-70, 2-71, 2-74, 2-75,
2-76, 2-77, 2-78, 2-79, 2-80, 2-81,
2-82, 2-83, 2-84, 2-111, 2-113; 4-49,
4-54; 5-23, 5-35, 5-37, 5-39; 6-33,
6-36; 7-45, 7-48–7-49, 7-51, 7-55;
8-22–8-23; 9-30–9-31, 10-19, 10-21,
10-23; 11-32–11-37; 12-22–12-23;
13-26, 13-28; 14-46, 14-50; 15-16,
15-18, 15-19; 17-35–17-36, 17-39–

- 17-41, 17-44; 18-12; 19-31, 19-34;
20-20–20-21, 20-23–20-24, 20-26;
21-27, 21-30; 22-21, 22-24; 23-29,
23-31; 24-4–24-5, 24-20, 24-39–
24-43
- giant garter snake. See special-status
species
- grade control structures, 2-16, 2-17,
2-33, 2-36, 2-41, 2-42, 2-43, 2-48,
2-51, 2-54, 2-55, 2-56, 2-68, 2-69,
2-71, 2-82; 5-22, 5-28–5-30, 5-33–
5-41; 9-30–9-31; 12-21; 14-43;
17-31, 17-35–17-36, 17-41; 18-11;
20-13, 20-16, 20-18, 20-20–20-22,
20-24; 24-43
- green sturgeon. See special-status
species
- groundwater recharge, 2-108, 2-109;
13-15, 13-19, 13-25–13-26, 13-28–
13-29; 27-35
- groundwater wells. See infrastructure
- hairy Orcutt grass. See special-status
species
- hatchery, 5-7–5-8, 5-14; 9-8; 20-5
- hazardous material sites, 2-105; 19-2,
19-11–19-12, 19-20–19-21, various;
26-30
- herbicide, 2-27, 2-29, 2-45, 2-59, 2-104,
2-105; 7-8; 14-40–14-42; 19-3,
19-16, 19-18, 19-21–19-22, 19-30,
19-35; 25-22; 26-27, 26-30, 26-31
- infrastructure, 11-9–11-11; 24-41,
24-42; 26-12
- canals and drains, 1-1, 1-16; 2-23;
23-9, 23-20, 23-21, 23-22–23-24,
various; 24-4, 24-10, 24-12–24-13,
24-19–24-20, various; 26-13, 26-38;
27-32, 27-35, 27-44
- electric and gas distribution, 23-7,
23-20; 26-13
- groundwater wells, 1-16, 2-19, 2-23,
2-25, 2-59, 2-74; 23-23–23-24,
23-28, 23-30, 23-32; 26-13
- oil and gas wells, 2-25; 26-30
- pumps, 1-21; 2-18, 2-23, 2-24, 2-28,
2-30, 2-39, 2-40, 2-43, 2-54, 2-56,
2-59, 2-72, 2-74, 2-82, 2-108; 5-1,
5-8, 5-20; 23-9, 23-17–23-18,
23-20–23-21, 23-23–23-24, various;
25-8; 26-13; 27-35, 27-38
- regulating reservoirs, 2-25
- relocations, 2-23, 2-47, 2-62, 2-63,
2-64, 2-69, 2-76, 2-81, 2-83, 2-84,
2-85, 2-108; 4-49, 4-54; 5-25;
12-22–12-23; 23-15, 23-18, 23-24,
23-26, 23-28–23-32; 26-13, 26-38;
27-35, 27-36, 27-39
- Interim Flows, 1-16, 1-17, 1-19, 1-21;
3-2; 5-1–5-2, 5-4, 5-16, 5-21; 6-1;
7-2, 7-26; 11-11; 14-4, 14-7, 14-18,
14-20–14-21, various; 15-1, 15-3;
16-19; 20-1, 20-7, 20-10; 24-3,
24-10; 27-36
- invasive species, 2-27, 2-44, 2-45, 2-57,
2-59, 2-60, 2-72, 2-73, 2-86; 6-14;
25-17, 25-23; 26-35; 27-17, 27-37
- jurisdictional wetlands, 15-1, 15-10–
15-19; 25-22–25-23
- juvenile salmonids, 2-16, 2-33, 2-42,
2-48, 2-59, 2-63, 2-74, 2-76; 5-2–
5-3, 5-18, 5-20–5-21, 5-23–5-27,
various; 25-14
- lateral erosion, 2-11; 14-34, 14-36–
14-37, 14-43–14-44, 14-51
- levees, 1-12, 1-16, 1-17, 2-18, 2-19,
2-20, 2-23, 2-27, 2-29, 2-30, 2-32,
2-33, 2-36, 2-37, 2-38, 2-40, 2-41,
2-44, 2-47, 2-48, 2-53, 2-62, 2-63,
2-64, 2-68, 2-76, 2-83, 2-84, 2-101,
2-102, 2-108, 2-109, 2-110, 2-112;
5-21–5-23, 5-26–5-30, various; 6-1–
6-2, 6-23; 11-10, 11-25–11-37; 12-1,
12-4–12-5, 12-11–12-12, 12-15,
various; Chapter 14, throughout;
15-2, 15-11, 15-12; 18-2; 19-13,
19-22; 21-11–21-12; 24-4, 24-20,
24-37, 24-42; 25-20–25-21; 26-11,
26-16, 26-27; 27-21–27-22, 27-37–
27-38
- local borrow areas, 2-19, 2-20; 11-28,
11-33, 11-35; 18-9–18-13

- maintenance. See operations and maintenance
- Mendota Dam, 1-4, 1-12, 1-14, 1-15, 1-16, 1-17, 1-18, 1-21; 2-14, 2-15, 2-29, 2-30, 2-36, 2-37, 2-40, 2-41, 2-44, 2-46, 2-51, 2-53, 2-56, 2-61, 2-63, 2-64, 2-67, 2-68, 2-69, 2-70, 2-71, 2-75, 2-77, 2-81, 2-82, 2-109, 2-111, 2-112, 2-113; 3-2, 3-4; 4-32, 4-49, 4-54; 5-1–5-2, 5-19, 5-22–5-24, 5-27–5-30, various; 6-2, 6-21–6-22; 7-6–7-7, 7-9, 7-26–7-27, 7-32, various; 8-18, 8-22–8-23; 9-10, 9-12, 9-21, 9-28, various; 10-17, 10-19, 10-21; 11-11, 11-27, 11-34; 12-3–12-4, 12-22–12-23; 13-18–13-19; 14-45–14-51; 15-3, 15-8, 15-11, 15-16, 15-18; 17-5, 17-20, 17-25, 17-31, 17-35–17-36, 17-39; 18-9, 18-12; 19-1, 19-14, 19-23, 19-31, 19-34; 20-2–20-4, 20-7, 20-9–20-27; 22-1, 22-3, 22-14, 22-16–22-17, 22-20–22-21, various; 23-9, 23-17, 23-21, 23-23, 23-29, 23-31; 24-2–24-6, 24-8–24-10, 24-13, 24-19–24-20, various; 25-18; 26-9, 26-15–26-16, 26-18, 26-25, 26-34; 27-37–27-38
- Mendota Pool, 1-1, 1-4, 1-7, 1-13, 1-14, 1-15, 1-16, 1-17, 1-18, 1-21, 1-22; 2-1, 2-3, 2-5, 2-9, various; 3-1–3-4; 4-32; 5-1–5-5, 5-7–5-8, 5-16–5-17, 5-19, various; 6-2, 6-5, 6-7, various; 7-12, 7-16, 7-26–7-27, various; 8-18; 9-1–9-2, 9-8, 9-21, 9-30; 10-17, 10-19, 10-21, 10-23; 11-17, 11-27; 12-3–12-4, 12-16; 13-12, 13-19, 13-22; 14-4, 14-6, 14-17–14-18, 14-21–14-22, various; 15-11; 16-23; 17-9, 17-25, 17-31; 17-36, 17-41; 18-9, 18-11; 19-2, 19-14, 19-29; 22-14, 22-16–22-17, 22-19, 22-23, 22-26; 23-2–23-3, 23-6, 23-8–23-9, 23-17, 23-20–23-22, 23-24, various; 24-2–24-5, 24-8–24-10, 24-12–24-21, 24-31–24-36, various; 25-3, 25-10, 25-14, 25-20–25-21, 25-30; 26-9, 26-17–26-18, 26-32–26-33; 27-19, 27-33–27-34, 27-36–27-39, 27-45
- monitoring, 1-9; 2-11, 2-23, 2-31, 2-32, 2-45, 2-57, 2-59, 2-60, 2-74, 2-85, 2-86, 2-87, 2-88, 2-89, 2-90, 2-91, 2-95, 2-96, 2-99, 2-100, 2-101, 2-103; 3-9; 4-8–4-9, 4-14, 4-36–4-39, 4-41–4-42; 6-24, 6-28–6-29, 6-33; 7-21; 9-23–9-32; 12-20; 13-13, 13-20–13-21; 14-5, 14-38–14-39; 16-14; 17-11, 17-27, 17-29, 17-37; 18-7, 18-10–18-11; 19-6, 19-9, 19-17–19-21, 19-23–19-26; 20-1–20-27; 22-6, 22-17, 22-21; 23-14, 23-20, 23-23–23-24, 23-28, 23-30, 23-32; 24-34, 24-38; 26-19–26-34, 26-36; 27-3, 27-36, 27-39, 27-41
- Native American Tribes, 9-1, 9-3, 9-11, 9-15–9-17, various; 14-23–14-24; 15-5; 26-24; 27-24–27-15
- nighttime construction, 17-14, 17-25, 17-32, 17-36, 17-41
- No-Action Alternative description, 2-1, 2-13–2-15; 3-7; 4-31–4-32, 4-40–4-44, 4-47–4-49, 4-52–4-54, 4-57–4-59; 5-16, 5-19–5-28; 6-19, 6-21–6-22; 7-25–7-27, 7-29–7-30, 7-32–7-33, various; 8-17–8-21; 9-20–9-21, 9-28–9-30; 10-13–10-15, 10-17, 10-19, 10-21, 10-23; 11-26–11-30; 12-15–12-16, 12-20–12-21; 13-18–13-20; 14-33–14-50; 15-10–15-11, 15-13–15-15; 16-18–16-20; 17-20, 17-23–17-25, 17-28, 17-32–17-34, 17-37–17-38, 17-41–17-42; 18-9; 19-12–19-14; 20-9–20-11; 21-17–21-18; 22-12; 23-18–23-21; 24-31–24-32; 25-23; 26-9
- noise-sensitive receptors, 17-15, 17-27; 26-28;
- North Canal, 2-1, 2-13, 2-76, 2-77, 2-78, 2-79, 2-80, 2-82, 2-83, 2-84; 4-54; 5-37, 5-39, 5-41; 6-26; 7-51, 7-53, 7-55; 8-23; 9-31; 11-35–11-37;

San Joaquin River Restoration Program

- 12-23; 13-28; 14-50–14-51; 15-18;
17-15, 17-41, 17-43-17-45; 18-12–
18-13; 19-34; 20-24–20-25; 21-30;
22-24; 23-31; 24-43
- oil and gas wells. See infrastructure
- operation and maintenance, 2-27, 2-53,
2-108; 4-31, 4-38, 4-44, 4-46,
various; 6-21; 12-11, 12-19; 17-20,
17-23, 17-25, 17-30, 17-34, 17-39,
17-41, 17-43-17-44; 21-12–21-13,
21-18, 21-24; 23-22, 23-28; 27-35
- Pacific lamprey. See special-status
species
- palmate-bracted bird's-beak. See
special-status species
- passage. See fish passage
- PCBs, 19-5, 19-16-19-18
- permits, 1-3, 1-11, 1-12, 1-24; 2-29,
2-47, 2-63, 2-76, 2-84, 2-85, 2-95,
2-96, 2-105, 2-106, 2-107; 3-9; 4-19,
4-22, 4-23, 4-26; 6-18; 7-19; 9-14–
9-15; 12-10–12-12; 14-28–14-29;
15-5; 19-21; 21-6–21-8; 22-6–22-7;
25-14; 26-11, 26-19, 26-26, 26-36–
26-39; 27-1–27-7, 27-9–27-15,
27-19, 27-21–27-24, various
- persistent organic pollutants, 14-39,
14-40, 14-45
- pesticide, 2-104, 2-105; 5-26, 5-27, 5-32,
5-40; 7-21; 14-17–14-18; 19-1,
19-3, 19-12, 19-15–19-16, 19-18,
19-21–19-22, 19-30, 19-32–19-35;
25-14, 25-22; 26-9, 26-17, 26-27,
26-30–26-31
- Phase I Environmental Site Assessment,
19-2, 19-10, 19-20, 19-22
- portage, 2-105, 20-13–20-14, 20-18,
20-21, 20-22, 20-25; 26-32
- predator, 2-30, 2-40, 2-41, 2-42, 2-54,
2-55, 2-97, 2-98, 2-99; 5-8, 5-16–
5-17, 5-21, 5-28; 7-11, 7-31, 7-34,
7-35, 7-37
- prey, 2-89; 5-2; 7-26, 7-32
- Program. See San Joaquin River
Restoration Program
- public access. See access
- public involvement, 1-7, 1-24; 27-1,
27-16, 27-31, 27-40–27-41
- public ownership, 16-27; 21-15, 21-23,
21-27, 21-29, 21-32
- pumps. See infrastructure
- regional economic impacts, 10-15–
10-16, 10-18, 10-20, 10-22; 21-14,
21-15, 21-20–21-21, 21-25, 21-28,
21-31; 25-28;
- regulating reservoirs. See infrastructure
- relocations. See infrastructure
- Report of Waste Discharge, 13-21
- Restoration Flows, 1-2, 1-3, 1-4, 1-17,
1-21, 1-22, 2-1, 2-9, 2-12, 2-14,
2-15, 2-17, 2-18, 2-23, 2-33, 2-37,
2-38, 2-39, 2-40, 2-44, 2-47, 2-48,
2-52, 2-53, 2-54, 2-57, 2-62, 2-63,
2-67, 2-68, 2-70, 2-76, 2-77, 2-80,
2-86, 2-100, 2-101, 2-102, 2-109;
5-19–5-23, 5-27–5-28, 5-33–5-34,
5-37–5-38, 5-41; 6-21–6-23, 6-25–
6-29; 7-25–7-27, 7-30, 7-34, 7-36,
various; 9-29; 11-27; 12-17–12-18;
13-12, 13-17–13-19, 13-22; 14-7,
14-30–14-31, 14-34–14-35, various;
15-11, 15-14, 15-18–15-19; 16-19–
16-20, 16-27, 16-32, 16-36, various;
20-7, 20-10–20-11; 21-12, 21-17–
21-18, 21-24; 22-13; 23-8, 23-17,
23-19–23-21; 24-3, 24-10, 24-32;
25-19, 25-31; 26-16, 26-37; 27-38
- riparian habitat, 1-4, 1-13, 1-14; 2-9,
2-16, 2-31, 2-44, 2-57, 2-72, 2-82,
2-86, 2-95, 2-99, 2-108, 2-110,
2-111; 5-16; 6-16–6-27, 6-29–6-31,
6-33–6-37; 7-37–7-38, 7-43–7-44,
7-49–7-51, 7-55–7-56; 8-16, 8-21–
8-24; 15-10–15-11, 15-14, 15-18–
15-19; 16-20–16-21, 16-37; 24-32;
25-6, 25-15–25-17; 25-23; 26-4–
26-5, 26-14, 26-36; 27-40
- salmon. See special-status species
- San Joaquin kit fox. See special-status
species
- San Joaquin River Restoration Program,

- overview, 1-1, 1-3, 1-12; 2-1; 17-23, 19-2; 20-5; 22-12; 23-1; 26-5, 26-34
- settlement, 1-1, 1-2, 1-3, 1-4, 1-7, 1-10, 1-11, 1-12, 1-13, 1-14, 1-22, 1-23; 21-12; 24-10; 25-1; 27-2
- San Mateo Avenue, 1-16, 1-17, 1-18, 1-20; 2-4, 2-5, 2-14, 2-15, 2-27, 2-28, 2-29, 2-30, 2-33, 2-37, 2-40, 2-43, 2-47, 2-48, 2-52, 2-61, 2-62, 2-64, 2-71, 2-77, 2-80, 2-106, 2-110, 2-111; 3-2; 4-32, 4-40, 4-44, 4-47, various; 5-1–5-2, 5-19–5-20, 5-22–5-25, 5-27–5-28, various; 6-2, 6-21–6-22, 6-29, various; 7-6, 7-25–7-27, 7-32, 7-39, various; 8-18, 8-22–8-23; 9-12, 9-21; 10-17; 11-11, 11-27; 12-16, 12-20–12-23; 13-19, 13-25, 13-26, 13-28; 14-4, 14-6, 14-10, 14-13–14-14, various; 15-11, 15-15, 15-17–15-18; 16-3, 16-20; 17-17, 17-19, 17-20, 17-28–17-35, 17-37–17-40, 17-42, 17-43; 18-9, 18-11, 18-12; 19-2, 19-14, 19-29, 19-32, 19-34, 19-36; 20-2, 20-4, 20-9, 20-10, 20-12, 20-13, 20-20, 20-25; 21-12, 21-17, 21-18; 22-3, 22-4, 22-13–22-23, 22-25, 22-26; 23-17, 23-19, 23-21, 23-23, 23-27, 23-29, 23-31; 24-2, 24-3, 24-8–24-10, 24-31–24-35, various; 25-15, 25-17, 25-30; 26-2, 26-3, 26-18, 26-28, 26-33; 27-5, 27-33
- sediment load, 8-2; 11-8–11-10; 14-26, 14-31–14-32, 14-34, 14-37, various
- seepage,
 - control measures, 1-2, 1-3, 1-23, 2-18, 2-19, 2-37, 2-40, 2-101; 13-15, 13-22–13-23, 13-26; 16-20, 16-26–16-27, 16-32, 16-36, 16-40; 17-39, 17-44; 26-16; 27-34, 27-36
 - effects, 2-15, 11-8, 11-29, 11-32, 11-34, 11-37; 12-3, 12-5, 12-14, 12-20, 13-8–13-9, 13-26, 13-29; 14-5; 16-19; 21-14, 21-17, 21-18; 25-21
- Short Canal, 2-1, 2-13, 2-29, 2-30, 2-63, 2-64, 2-65, 2-66, 2-67, 2-68, 2-69, 2-71, 2-74, 2-75, 2-76, 2-80, 2-81, 2-83, 2-109; 4-49; 5-33–5-35; 6-33; 7-45, 7-47–7-49; 8-22; 9-30; 10-19; 12-22–12-23; 13-26; 14-46; 15-16; 17-15, 17-35, 17-36, 17-39–17-40; 18-12; 19-31; 20-20; 21-27; 22-21; 23-29
- South Canal, 2-1, 2-13, 2-33, 2-34, 2-35, 2-36, 2-37, 2-38, 2-39, 2-43, 2-45, 2-46, 2-47, 2-54, 2-64, 2-67, 2-68, 2-69, 2-73, 2-74, 2-77, 2-80, 2-82; 4-32; 5-22–5-25, 5-28; 6-22; 7-27; 8-18; 9-21; 10-15; 11-32–11-34; 12-16; 13-19; 14-35–14-36, 14-51; 15-11; 17-35, 17-36, 17-39, 17-40; 18-12; 19-14; 20-11, 20-13–20-15, 20-17, 20-18; 21-18; 22-14; 23-21; 24-39; 26-32
- special-status species, 6-20, 7-22–7-23, 7-37–7-39, 7-45, 7-50, 7-51, 7-57; 26-12, 26-14, 26-35
 - bats, 2-93; 7-26, 7-35–7-36, 7-56; 26-36
 - blunt-nosed leopard lizard, 2-88; 7-2, 7-9, 7-11, 7-23, 7-26, 7-28, 7-30–7-33, 7-39, 7-42, various; 26-35; 27-20
 - burrowing owl, 2-29, 2-92; 7-10, 7-15, 7-28, 7-33, various; 26-36
 - Central Valley steelhead, 2-96, 2-97; 5-6–5-8, 5-25; 26-36
 - Chinook salmon, 1-2, 1-3, 1-7, 1-13, 1-14; 5-5–5-6, 5-9–5-11, 5-16, 5-20, 5-25; 26-9, 26-36; 27-8
 - Delta smelt, 5-6–5-7
 - endangered species, 1-11; 5-6, 5-12, 5-13; 7-24; 26-10; 27-8, 27-19, 27-40
 - fairy shrimp, 7-11
 - fall-run Chinook salmon, 1-3, 1-7, 1-13, 1-14; 5-5, 5-6, 5-9–5-10
 - Fresno kangaroo rat, 2-93; 7-10, 7-13, 7-22, 7-23, 7-25, various; 26-36

- giant garter snake, 2-88, 2-89, 2-90;
7-9, 7-11, 7-23, 7-26, various; 26-12,
26-35
- green sturgeon, 2-96; 5-5, 5-25;
26-36
- hairy Orcutt grass, 6-11
- Pacific lamprey, 2-17, 2-94; 5-4,
5-25; 26-36
- palmate-bracted bird's-beak, 6-10
- salmon, 1-1-1-2, 1-4, 1-7, 1-13-
1-14; 2-10, 2-14, 2-16, 2-17, various;
5-2, 5-14, 5-17, 5-18, various; 21-17;
22-12; 23-18; 24-31; 25-14; 26-5,
26-9, 26-36; 27-8, 27-40
- San Joaquin kit fox, 2-94; 7-13,
7-24, 7-36; 26-36
- spring-run Chinook salmon, 1-1, 1-2,
1-3, 1-4, 1-7, 1-13, 1-14; 2-96, 2-98;
5-6, 5-10-5-11, 5-25; 26-36
- steelhead, 20-5, 20-9-20-10; 26-36
- succulent owl's clover, 6-10
- Swainson's hawk, 2-73, 2-90, 2-91;
7-9, 7-12, 7-26, 7-34-7-35, various;
26-12, 26-35;
- tricolored blackbird, 7-9, 7-12, 7-28,
7-40, various;
- Valley elderberry longhorn beetle,
2-87; 6-6; 7-9, 7-11-7-12, 7-14-
7-16, 7-22-7-23, various; 26-35
- western pond turtle, 2-90; 7-10, 7-14,
7-23, 7-26, 7-28, various; 26-35
- white-tailed kite, 7-9, 7-12, 7-26,
7-29, various;
- steelhead. See special-status species
- sturgeon. See special-status species
- succulent owl's clover. See special-
status species
- SVP Guidelines, 18-6-18-7, 18-9-18-11;
26-29
- Swainson's hawk. See special-status
species
- tricolored blackbird. See special-status
species
- utility crossing, 23-1, 23-6, 23-14-
23-16, 23-20, 23-25, 23-28, various
- Valley elderberry longhorn beetle. See
special-status species
- Valley fever, 2-105; 19-3-19-4, 19-13,
19-23-19-24, 19-30, 19-33, 19-35;
26-31
- vernal pools, 2-95; 6-9-6-11; 7-11, 7-14,
7-25
- viewshed, 24-33, 24-40, 24-44
- western pond turtle. See special-status
species
- wetland habitat, 2-86, 2-95; 7-5-7-6,
7-12, 7-15, 7-31, various; 15-1,
15-9-15-14
- white-tailed kite. See special-status
species
- Williamson Act, 2-107; 10-12, 10-14,
10-16, 10-18, 10-20, 10-22; 16-8,
16-12-16-13, 16-17-16-19, 16-23-
16-26, 16-31, 16-35-16-36, 16-39-
16-40; 21-23; 26-2-26-3, 26-15,
26-17, 26-27; 27-23-27-24