

1 **Final Environmental Impact Statement/ Environmental Impact**
2 **Report**

3 **Friant-Kern Canal Middle Reach**
4 **Capacity Correction Project**

5 **EIS/EIR-18-057**

6 **State Clearinghouse No. 2019120007**

Estimated Lead Agency Total Costs
Associated with Developing and
Producing this EIS/EIR

\$2,050,000



— BUREAU OF —
RECLAMATION

Bureau of Reclamation
Interior Region 10 California-Great Basin
California*, Nevada*, Oregon*
***Partial**



September 2020

1 **Mission Statements**

2 The mission of the Department of the Interior is to conserve and manage the Nation's natural resources
3 and cultural heritage for the benefit and enjoyment of the American people, provide scientific and other
4 information about natural resources and natural hazards to address societal challenges and create
5 opportunities for the American people, and honor the Nation's trust responsibilities or special
6 commitments to American Indians, Alaska Natives, and affiliated island communities to help them
7 prosper. The mission of the Bureau of Reclamation is to manage, develop, and protect water and related
8 resources in an environmentally and economically sound manner in the interest of the American public.

9 Friant Water Authority is a public agency formed by its members under California law to operate and
10 maintain the Friant-Kern Canal and to represent our members in federal or state policy, and in political
11 and operational decisions that could affect the Friant Division's water supply. Friant's goal is to provide
12 dependable, sustainable water from Millerton Lake to Friant Contractors.

1 **Friant-Kern Canal Middle Reach Capacity**
2 **Correction Project**
3 **Final Environmental Impact**
4 **Statement/Environmental Impact Report**

5 **NEPA Lead Agency: United States Department of the Interior, Bureau of Reclamation, Interior**
6 **Region 10 California – Great Basin**

7 **CEQA Lead Agency: Friant Water Authority**

8 **State Clearinghouse # 2019120007**

9 Since completion of construction by the Bureau of Reclamation (Reclamation) in 1951, the Friant-Kern
10 Canal (FKC) has lost its ability to fully meet its previously designed and constructed capacity, resulting
11 in restrictions on water deliveries to the Friant Division long-term contractors. The reduction in capacity
12 is a result of several factors, including regional land subsidence that has occurred over the past several
13 decades, original design deficiency, and other factors that prevent the intended flow capacity. Hydraulic
14 modeling, completed as part of the *Friant-Kern Canal Capacity Restoration Feasibility Report*,
15 authorized pursuant to Section 10201(a)(1) of the San Joaquin River Restoration Settlement Act, in
16 Public Law 111-11, confirmed the reduction in FKC capacity.

17 Reclamation and the Friant Water Authority, pursuant to the National Environmental Policy Act and the
18 California Environmental Quality Act, respectively, have prepared this Final Environmental Impact
19 Statement/Environmental Impact Report (Final EIS/R) to analyze the Friant-Kern Canal Middle Reach
20 Capacity Correction Project. The Final EIS/R analyzes the proposed alternatives to restore an
21 approximately 33-mile reach of the FKC from milepost 88 to milepost 121.5.

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1 Table of Contents

2		Page
3	Executive Summary	xi
4	Purpose and Need	xii
5	CEQA Goals and Objectives	xii
6	Alternatives Evaluated in this Final EIS/R	xii
7	Environmental Commitments/Mitigation Measures	xiv
8	Summary of Environmental Impacts by Resource	xiv
9	Chapter 1. Introduction, Purpose and Need, and Project Objectives	1
10	San Joaquin River Restoration Settlement and Act	3
11	NEPA Purpose and Need	4
12	CEQA Goals and Objectives	4
13	Agency Coordination	4
14	NEPA Cooperating Agencies	5
15	Chapter 2. Description of Alternatives	7
16	Existing Conditions	7
17	No Action/No Project Alternative	8
18	Project Alternatives	8
19	General Construction Practices	13
20	Comparison of Existing Conditions with Project Alternatives	14
21	Alternatives Considered but Eliminated	16
22	Environmental Commitments/Mitigation Measures	18
23	Chapter 3. Affected Environment/ Environmental Setting	21
24	Introduction	21
25	Air Quality	21
26	Biological Resources	23
27	Cultural Resources	25
28	Geology and Soils	28
29	Greenhouse Gases/Climate Change	34
30	Hazards and Hazardous Materials/Wildfire	35
31	Hydrology and Water Quality	37
32	Land Use and Planning and Agricultural Resources	42
33	Noise	47
34	Transportation	48
35	Tribal Cultural Resources	49
36	Utilities and Service Systems and Energy	51
37	Chapter 4. Environmental Consequences/ Environmental Impacts	53
38	Introduction	53
39	Air Quality	54
40	Biological Resources	63
41	Cultural Resources	71
42	Geology and Soils	76

Table of Contents

1	Greenhouse Gases/Climate Change.....	80
2	Hazards and Hazardous Materials/Wildfire.....	85
3	Hydrology and Water Quality.....	89
4	Land Use and Planning and Agricultural Resources	93
5	Noise	99
6	Transportation.....	103
7	Tribal Cultural Resources	109
8	Utilities and Service Systems and Energy	110
9	Chapter 5. Cumulative Effects.....	115
10	Methods and Assumptions.....	115
11	Cumulative Effects Analysis.....	119
12	Chapter 6. Disclosures, Consultation and Coordination, and Other CEQA	
13	Considerations.....	125
14	Relationship between Short-Term Uses and Long-Term Productivity.....	125
15	Irreversible and Irrecoverable Commitments of Resources	126
16	Growth-Inducing Impacts	127
17	Significant Unavoidable Impacts.....	127
18	Environmentally Preferable/Superior Alternative	127
19	Public Outreach and Agencies/Persons Consulted	129
20	Index	133

21 List of Tables

22	Table ES-1. Summary of Environmental Impacts by Resource	xvi
23	Table 2-1. Design Flow Rates for the Middle Reach of the FKC	9
24	Table 2-2. Features of Project Alternatives.....	13
25	Table 2-3. Comparison of Existing Conditions, the No Action Alternative, and	
26	Project Alternatives.....	15
27	Table 3-1. Tulare and Kern Counties State and Federal Attainment Status.....	22
28	Table 3-2. Previously Recorded Cultural Resources Identified in 2018 Records	
29	Search.....	26
30	Table 3-3. Cultural Resources Evaluated and Recommended to Be Eligible as a	
31	Result of This Study.....	27
32	Table 3-4. Active Faults in the Vicinity of the Project Area.....	30
33	Table 3-5. Soil Unit Classifications in the Project Area	32
34	Table 3-6. Land Use Zoning Designations Mapped in the Project Area	43
35	Table 3-7. Total Acres of Farmland Mapping and Monitoring Program Farmland and	
36	Other Categories Mapped in the Project Area between 2014 to 2016.....	46
37	Table 3-8. Existing Level of Service.....	49
38	Table 4-1. Air Quality Thresholds of Significance	54
39	Table 4-2. Estimated Habitat Impacts	64
40	Table 4-3. Eligible Cultural Resources and Character-Defining Features	71
41	Table 4-4. Cultural Resources Impacted by CER Alternative	73
42	Table 4-5. Cultural Resources Impacted by CE Alternative	75
43	Table 4-6. Estimated CER Alternative Greenhouse Gas Emissions.....	83
44	Table 4-7. Estimated CE Alternative Greenhouse Gas Emissions.....	84
45	Table 4-8. Tulare Lake Basin Plan Parameters and Water Quality Objectives	90

1 Table 4-9. Simulated Long-Term Average Annual Deliveries Below FKC Capacity
 2 Constraints91
 3 Table 4-10. Impacts by Project Alternative on Designated Important Farmland and
 4 Williamson Act Contract Lands.....95
 5 Table 4-11. Impacts by Project Alternative on Zoning Designations97
 6 Table 4-12. Construction Equipment Noise Levels from the RCNM Users guide99
 7 Table 4-13. Vibration Levels for Construction Equipment.....102
 8 Table 4-14. Roadway Level of Service Descriptions.....104
 9 Table 4-15. Roadway Level of Service for Uninterrupted Flow Highways105
 10 Table 4-16. Existing Plus Construction Traffic Level of Service – CER Alternative106
 11 Table 4-17. Existing Plus Construction Traffic Level of Service – CE Alternative108
 12 Table 5-1. Cumulative Projects List.....116
 13 Table 6-1. Comparison of Alternatives128
 14 Table 6-2. Draft EIS/R Distribution List.....132

15 **Figures**

16 Figure 1-1. Project Location2
 17 Figure 2-1. Projected Land Surface Elevation Change in 2040 and 2070 Along the
 18 Friant-Kern Canal Middle Reach.....9
 19 Figure 2-2. Project Alternatives.....12
 20 Figure 3-1. Geologic Map of the Project Area29
 21 Figure 3-2. Regional Fault and Seismicity Map.....31
 22 Figure 3-3. Canal Embankment Section Showing a Typical Phase 1 Boring and CPT34
 23 Figure 3-4. Friant-Division Contractors Affected by Subsidence and Hydrologic
 24 Features in the Project Area.....39

25 **Appendices**

26 Appendix A. Acronyms and Abbreviations, References, and List of Preparers
 27 Appendix B1. Project Alternatives Description
 28 Appendix B2. Environmental Commitments/Mitigation Measures
 29 Appendix C. Regulatory Setting
 30 Appendix D. Environmental Assessment/Initial Study Friant-Kern Canal Middle Reach
 31 Capacity Correction Project
 32 Appendix E. Air Quality and Greenhouse Gases and Emissions Results
 33 Appendix F. Biological Resources Assessment
 34 Appendix G. Land Use Zoning and Farmland Mapping and Monitoring Program
 35 Figures
 36 Appendix H. Noise Baseline Terminology and Noise Levels
 37 Appendix I. Transportation Assumptions
 38 Appendix J. Scoping Report
 39 Appendix K. Changes to the Draft EIS/R
 40 Appendix L. Responses to Comments on the Draft EIS/R
 41 Appendix M. Mitigation Monitoring and Reporting Program
 42 Appendix N. US Fish and Wildlife Service - Biological Opinion
 43

Table of Contents

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1 Executive Summary

2 The United States Department of the Interior, Bureau of Reclamation (Reclamation) and Friant
3 Water Authority (FWA) are proposing the Friant-Kern Canal Middle Reach Capacity Correction
4 Project (Project) to analyze alternatives to restore the capacity of a 33-mile reach of the Friant-
5 Kern Canal (FKC) (mile post [MP] 88 to MP 121.5) (Middle Reach) to its original design and
6 constructed capacity levels.

7 In 1942, Reclamation completed construction of Friant Dam, located on the San Joaquin River
8 (SJR) about 16 miles northeast of Fresno, California, as part of the Central Valley Project (CVP).
9 Currently, Friant Dam regulates the flow of the SJR and provides for: downstream releases to
10 meet Restoration Flow requirements in the SJR, flood control, storage, and releases to the SJR
11 and diversion into the Madera Canal and FKC for delivery of water to more than one million
12 acres of agricultural land in Merced, Madera, Fresno, Tulare, and Kern Counties. Friant Dam
13 serves the CVP Friant Division long-term contractors (Friant Contractors) through three separate
14 river and canal outlets: the SJR, the Madera Canal, and the FKC. The FKC conveys water by
15 gravity more than 152 miles in a southerly direction from Millerton Lake near the community of
16 Friant to the Kern River four miles west of Bakersfield. The Friant Division of the CVP provides
17 supplemental water supplies for agricultural and municipal and industrial uses in Fresno, Tulare,
18 and Kern Counties.

19 Since completion of construction by Reclamation in 1951, the FKC has lost its ability to fully
20 convey its previously designed and constructed capacity, resulting in restrictions on water
21 deliveries to the Friant Contractors. The reduction in capacity is a result of several factors,
22 including regional land subsidence that occurred over the last several decades and original design
23 limitations. Hydraulic modeling completed as part of the *Friant-Kern Canal Capacity*
24 *Restoration Feasibility Report* authorized pursuant to Section 10201(a)(1)¹ of the San Joaquin
25 River Restoration Settlement Act (Settlement Act; Public Law 111-11, Title X, Part I) confirmed
26 the reduction in FKC capacity in several segments.

27 Reclamation, the National Environmental Policy Act (NEPA) Lead Agency, and FWA, the
28 California Environmental Quality Act (CEQA) Lead Agency, have prepared this joint Final
29 Environmental Impact Statement/Environmental Impact Report (Final EIS/R) to comply with
30 NEPA and CEQA. This Final EIS/R analyzes the direct, indirect, and cumulative effects of
31 implementing the Project Alternatives. This Final EIS/R serves as an informational document for
32 decision makers, public agencies, nongovernmental organizations, and the public for reviewing
33 the impacts of the Project Alternatives.

¹ Section 10201(a)(1) also authorizes evaluation of the restoration of the capacity of the Madera Canal, which will be completed separately.

1 Purpose and Need

2 The FKC Middle Reach has lost over 50 percent of its original design capacity due to regional
3 land subsidence and a design deficiency. This has resulted in water delivery impacts on Friant
4 Contractors, reduced ability of the FKC to convey flood waters during wet years, reduced ability
5 to implement provisions of the Water Management Goal as described in Paragraph 16 of the
6 Settlement, and a reduced ability to store and manage the timing and volume of Restoration
7 Flows in Millerton Lake and flood flows at Friant Dam.

8 The purpose and need of Reclamation's Proposed Action is to restore the conveyance capacity of
9 the FKC Middle Reach to such capacity as previously designed and constructed by Reclamation,
10 as provided for in Public Law 111-11, Section 10201 and improve operations of existing
11 facilities at Friant Dam consistent with and as allowed for by the Water Infrastructure
12 Improvements for the Nation Act, which will result in fewer spills and uncontrolled releases of
13 water and thus more efficiently use storage capacity in Millerton Lake.

14 CEQA Goals and Objectives

15 The primary goal for the Project is to restore the original design capacity of the Middle Reach of
16 the FKC. The objectives of the Project are as follows:

- 17 • restore capacity to original designed and constructed levels that meet the water supply
18 delivery requirements of the CVP contracts of long-term contractors;
- 19 • restore capacity to convey water for the short-term conveyance of flood flows or non-
20 CVP project water as well as provide potential surface water supplies for other users
21 through exchanges and transfers;
- 22 • facilitate accommodation of potential future reductions in conveyance capacity caused by
23 anticipated continued subsidence following Project implementation by designing and
24 maintaining the restored capacity for a service life of at least 50 years; and
- 25 • restore capacity to the maximum extent using the original gravity conveyance design that
26 avoids reliance on additional mechanical facilities and increased energy demands.

27 Alternatives Evaluated in this Final EIS/R

28 No Action/No Project Alternative

29 The No Action/No Project Alternative (No Action Alternative) includes projected conditions as
30 they would exist in the year 2070 if the Project is not implemented. The year 2070 is used as the
31 projected condition because both Project Alternatives are designed to correct for anticipated
32 future subsidence through 2070 consistent with Reclamation requirements. The No Action
33 Alternative is defined based on the affected environment/existing conditions and reflects changes
34 that would result from actions that could occur in the Project area in the future that currently do
35 not exist in the Project area and that do not rely on approval or implementation of the Project.
36 Differences between existing conditions and anticipated future conditions without the Project are
37 detailed for each resource, as appropriate. A detailed description of the No Action Alternative is
38 provided in Appendix B1. Under the No Action Alternative, Reclamation and FWA would not
39 take additional actions towards restoring the capacity of the FKC Middle Reach. Four reasonably

Executive Summary

1 foreseeable actions have been identified that will affect future conditions in the Project area
2 under the No Action Alternative: (1) annual Restoration Flow² volume would increase through
3 2025 when SJR channel improvements allow for full and continued release of annual Restoration
4 Flow volume; (2) projected additional subsidence will further reduce the FKC Middle Reach
5 capacity, which will further reduce CVP water supplies to some Friant Contractors; (3) full
6 compliance with the state’s Sustainable Groundwater Management Act (by 2040) could restrict
7 groundwater pumping and preclude the ability of Friant Contractors to offset reduced FKC water
8 deliveries with additional groundwater supplies; (4) and Friant Contractors would attempt to
9 minimize water delivery impacts by rescheduling allocated CVP water supplies in available
10 Millerton Lake conservation space (storing) for delivery at a later time.

11 **Project Alternatives**

12 There are two Project Alternatives considered in the Final EIS/R to address subsidence impacts:
13 (1) a Canal Enlargement and Realignment Alternative (CER Alternative); and (2) a Canal
14 Enlargement Alternative (CE Alternative) as described below. The designed flow rates of the
15 Project Alternatives would restore the capacity of the Middle Reach of the FKC to the original
16 design rates and are broken into four distinct segments that are separated by check structures:
17 Segment 1 (design flow rate of 4,500 cubic feet per second [cfs]) spans from mile post (MP) 88.2
18 to MP 95.7, Segment 2 (design flow rate of 4,000 cfs) from MP 95.6 to MP 102.6, Segment 3
19 (design flow rate of 4,000 cfs) from MP 102.6 to MP 112.9, and Segment 4 (design flow rate of
20 3,500 cfs) from MP 112.9 to MP 121.5. Additional details for each alternative are included in
21 Appendix B1.

22 Reclamation’s federal discretionary actions associated with both alternatives include
23 implementation, cost-share funding pursuant to the Friant Division Improvements Legislation
24 Public Law 111-11 Section 10201 and the Water Infrastructure Improvements for the Nation Act
25 (Public Law 114-322 Section 4007), issuance of a repayment contract, as well as approvals of
26 actions being conducted within Reclamation’s right-of-way (ROW) and any needed land
27 acquisition.

28 **Canal Enlargement and Realignment Alternative (CER Alternative)**

29 The CER Alternative is identified as the proposed Project by FWA pursuant to CEQA. Based on
30 the information provided in the Final EIS/R, comparison of impacts between the alternatives, and
31 following public review of the Draft EIS/R, Reclamation has identified the CER Alternative as
32 the Preferred Alternative pursuant to NEPA.

33 The CER Alternative would restore the FKC design capacity using two methods: (1) raising
34 portions of the embankments in the existing FKC and (2) constructing a realigned canal segment
35 east of the existing FKC.

- 36 • **Canal Enlargement** – The existing canal would be enlarged by raising the lining up to
37 four feet in Segment 1 from MP 88.2 (at Avenue 208) to MP 95.7 (immediately south of

² Restoration flows are specific volumes of water to be released from Friant Dam during different water year types, according to Exhibit B of the Settlement and began on January 1, 2014.

Executive Summary

1 Tule River) and in Segment 4 from MP 116.0 (at Avenue 8) to MP 121.5 (at the Lake
2 Woollomes check), for a total of about 13 miles.

- 3 • **Canal Realignment** – The new realigned canal segment would be constructed
4 immediately east of the existing FKC and would serve as the exclusive water conveyance
5 and delivery mechanism throughout its length. Most of the existing FKC adjacent to the
6 new realigned canal segment would be taken out of service; however, limited portions
7 would be preserved for use as delivery pools at existing pump station turnouts. For those
8 portions removed from conveyance service, FWA would continue to operate and
9 maintain the canal consistent with their Operations, Maintenance, and Repair (OM&R)
10 Agreement with Reclamation and Reclamation regulations. The realigned segment would
11 extend about 20 miles from MP 95.7 to MP 116, which encompasses all of Segments 2,
12 3, and a portion of Segment 4.

13 **Canal Enlargement Alternative (CE Alternative)**

14 The CE Alternative would restore FKC design capacity using two methods: (1) raising portions
15 of the embankments in the existing FKC and (2) raising and widening portions of the
16 embankments of the existing FKC.

- 17 • **Canal Raising** – The existing canal would be enlarged by raising the lining up to four
18 feet in Segment 1 from MP 88.2 to MP 95.7 and Segment 4 from MP 116.0 to MP 121.,
19 about 13 total miles.
- 20 • **Canal Raising and Widening** – About 16 miles of the existing canal would be enlarged
21 by raising the embankments up to 15 feet and widening the canal (approximately 28 feet
22 wide on each embankment or a total of 56 feet wide) in Segments 2, 3, and a portion of
23 Segment 4 from MP 95.7 to MP 116. Short sections (between 0.25 and up to 2.2 miles) of
24 a bypass canal would be constructed as part of this alternative within this reach, totaling
25 approximately four miles. Most of the corresponding segments of the existing FKC
26 would be taken out of service; however, limited portions would be preserved for use as
27 delivery pools at existing pump station turnouts.

28 **Environmental Commitments/Mitigation Measures**

29 Environmental commitments (ECs) under NEPA have been incorporated as part of the Project
30 Alternatives to reduce or avoid effects that could result from their implementation. ECs are based
31 on adopted rules or regulations; regulatory agency plans, policies, or programs; or accepted
32 industry standards (“best practices”). In most cases, the ECs are synonymous with mitigation
33 measures (MMs) under CEQA; however, for some resources, ECs have been proposed even
34 when impacts are deemed “less than significant” under CEQA. These include ECs/MMs BIO-
35 11.5, AG-2, and NOI-1 (see Environmental Commitments/Mitigation Measures section in
36 Chapter 2 for a list of all ECs/MMs). ECs and MMs are listed for resource topics in Table ES-1.
37 The full text of all ECs and MMs is available in Appendix B2.

38 **Summary of Environmental Impacts by Resource**

39 This Final EIS/R assesses the CER Alternative and CE Alternative for their potential adverse
40 effects (i.e., environmental impacts) under both NEPA and CEQA. CEQA requires that the

Executive Summary

1 impacts of a proposed project and its alternatives are identified in terms of their level of
2 significance. To meet this requirement, there are specific “significance criteria” defined for each
3 resource area, and each alternative is assessed for its impact relative to these criteria. This Final
4 EIS/R uses the following terminology based on CEQA to denote the significance of each
5 environmental effect (impact): significant and unavoidable, significant, potentially significant,
6 less than significant, and no impact. For all impacts that could be identified as significant or
7 potentially significant, appropriate ECs/MMs are identified to reduce the impacts. NEPA does
8 not require a determination for the level of significance. ECs/MMs set forth to mitigate
9 potentially significant/adverse effects for NEPA will also address potentially significant impacts
10 for CEQA.

11 Table ES-1 summarizes and discloses the potential environmental impacts of the No Action
12 Alternative, CER Alternative and CE Alternative, as well as ECs/MMs that would be
13 implemented to reduce impacts from the Project Alternatives. The impacts listed in the table are
14 NEPA impacts as well as CEQA impacts, but they are judged for their level of significance only
15 under CEQA. The table includes the significance determinations made pursuant to CEQA
16 throughout the Final EIS/R, as well as the residual impacts after any proposed EC/MM is
17 applied. ECs/MMs will reduce or avoid the majority of the significant or potentially significant
18 impacts to resources analyzed in the EIS/R; however, implementation of the Project Alternatives
19 will have significant unavoidable cultural resources impacts due to impacts to the FKC,
20 agricultural resources due to the permanent conversion of important farmland, and transportation
21 impacts due to a potential increase in emergency response times. The No Action Alternative
22 would result in potentially significant impacts on the following resources: air quality due to
23 fugitive dust from fallowed land, Swainson’s hawk due to removal of foraging habitat from land
24 fallowing, and geology and soils due to erosion from land fallowing. The No Action Alternative
25 would also have significant and unavoidable impacts on agricultural lands due to conversions of
26 agricultural lands from land fallowing, and groundwater due to reductions in deliveries that
27 would impede sustainable groundwater management in the Tule and Kern Subbasins. Additional
28 detail for each impact is provided in Chapter 4 for each of the resource sections evaluated in this
29 Final EIS/R.

Executive Summary

1 **Table ES-1. Summary of Environmental Impacts by Resource**

Impacts	No Action	CER Alternative	CE Alternative	ECs/MMs	Level of Significance after ECs/ MMs (applicable to both CER and CE Alternatives)
Air Quality					
AQ-1: Conflict with or obstruct implementation of the applicable air quality plan.	Less than significant	Significant	Significant	AQ-1 and AQ-2	Less than significant
AQ-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.	Less than significant	Significant	Significant	AQ-1 and AQ-2	Less than significant
AQ-3: Expose sensitive receptors to substantial pollutant concentrations.	Significant	Significant	Significant	AQ-1, HAZ-1-1, and HAZ-1-2	Less than significant
Biological Resources					
BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	Potentially significant	Potentially significant	Potentially significant	BIO-1a through BIO-1l	Less than significant
BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	Less than significant	Potentially significant	Potentially significant	BIO-2a through BIO-2c	Less than significant
BIO-3: Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal,	Less than significant	Potentially significant	Potentially significant	BIO-3a through BIO-3d	Less than significant

Executive Summary

Impacts	No Action	CER Alternative	CE Alternative	ECs/MMs	Level of Significance after ECs/ MMs (applicable to both CER and CE Alternatives)
filling, hydrological interruption, or other means.					
BIO-4: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	Less than significant	Potentially significant	Potentially Significant	BIO-1a through BIO-1l	Less than significant
BIO-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	No impact	Significant	Significant	BIO-1a through BIO-1l	Less than significant
Cultural Resources					
Impact CUL-1: Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.	No impact	Significant	Significant	CUL-1	Significant and unavoidable
Impact CUL-2: Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	No impact	Potentially significant	Potentially significant	CUL-1 and CUL-2	Less than significant
Impact CUL-3: Disturb any human remains, including those interred outside of formal cemeteries.	No impact	Potentially significant	Potentially significant	CUL-1 and CUL-3	Less than significant
Geology and Soils					
GEO-1: Potentially cause substantial direct or indirect adverse effects, including the risk of loss, injury, or death, from strong seismic ground shaking or seismic-related ground failure, including liquefaction.	No impact	Potentially significant	Potentially significant	GEO-1	Less than significant
GEO-2: Result in substantial soil erosion or the loss of topsoil.	Potentially significant	Significant	Significant	GEO-2-1 through 2-4	Less than significant

Executive Summary

Impacts	No Action	CER Alternative	CE Alternative	ECs/MMs	Level of Significance after ECs/ MMs (applicable to both CER and CE Alternatives)
GEO-3: Be located on strata or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.	No impact	Potentially significant (liquefaction only)	Potentially significant (liquefaction only)	GEO-1	Less than significant
GEO-4: Be located on expansive soil, creating substantial direct or indirect risks to life or property.	No impact	Less than significant	Less than significant	N/A	N/A
GEO-5: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	No impact	Potentially significant	Potentially significant	GEO-5	Less than significant
Greenhouse Gases/Climate Change					
GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	No impact	Less than significant	Less than significant	N/A	N/A
GHG-2: Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.	No impact	Less than significant	Less than significant	N/A	N/A
Hazards and Hazardous Materials/Wildfire					
HAZ-1: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	No impact	Significant	Significant	HAZ-1-1, HAZ-1-2, HAZ-1-3, and GEO-2-1	Less than significant
HAZ-2: Result in hazardous materials emissions or handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	No impact	Significant	Significant	HAZ-1-1 and HAZ-1-2	Less than significant

Executive Summary

Impacts	No Action	CER Alternative	CE Alternative	ECs/MMs	Level of Significance after ECs/ MMs (applicable to both CER and CE Alternatives)
HAZ-3: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	No impact	Less than significant	Less than significant	N/A	N/A
WILD-1: Substantially impair an adopted emergency wildfire response plan or emergency wildfire evacuation plan.	No impact	Less than significant	Less than significant	N/A	N/A
Hydrology and Water Quality					
HYDRO-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.	No impact	Potentially significant	Potentially significant	GEO-2-1 through 2-4 and HAZ-1-1	Less than significant
HYDRO-2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.	Significant and unavoidable	Less than significant and potentially beneficial	Less than significant and potentially beneficial	N/A	N/A
HYDRO-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site.	No impact	Potentially significant (Deer Creek and White River only)	Potentially significant (Deer Creek and White River only)	GEO-2-1 through 2-4	Less than significant
HYDRO-4: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	No impact	Less than significant	Less than significant	N/A	N/A
Land Use and Planning and Agricultural Resources					
LAND-1: Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation	No impact	Less than significant	Less than significant	AG-2	Less than significant

Executive Summary

Impacts	No Action	CER Alternative	CE Alternative	ECs/MMs	Level of Significance after ECs/ MMs (applicable to both CER and CE Alternatives)
adopted for the purpose of avoiding or mitigating an environmental effect.					
AG-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.	Significant and unavoidable	Significant	Significant	AG-1	Significant and unavoidable
AG-2: Conflict with existing zoning for agricultural use or a Williamson Act contract.	No impact	Less than significant	Less than significant	AG-2	Less than significant
AG-3: Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.	Significant and unavoidable	Less than significant	Less than significant	N/A	N/A
Noise					
NOI-1: Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in local general plans or noise ordinances or applicable standards of other agencies.	No impact	Less than significant	Less than significant	NOI-1	Less than significant
NOI-2: Generation of excessive groundborne vibration or groundborne noise levels.	No impact	Less than significant	Less than significant	N/A	N/A
Transportation					
TRAN-1: Conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	No impact	Potentially significant	Potentially significant	TRAN-1-1 and TRAN-1-2	Less than significant

Executive Summary

Impacts	No Action	CER Alternative	CE Alternative	ECs/MMs	Level of Significance after ECs/ MMs (applicable to both CER and CE Alternatives)
TRAN-2: Result in inadequate emergency access.	No impact	Potentially significant	Potentially significant	TRAN-2	Significant and unavoidable
TRAN-3: Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections).	No impact	Less than significant	Less than significant	N/A	N/A
TRAN-4: Exceed, either individually or cumulatively, a level of service standard established by the County congestion management agency for designated roads or highways.	No impact	Less than significant	Less than significant	N/A	N/A
Tribal Cultural Resources					
TRIBE-1: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074.	No impact	No impact	No impact	N/A	N/A
Utilities and Service Systems and Energy					
UT-1: Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.	Less than significant	Less than significant	Less than significant	N/A	N/A
EN-1: Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.	Less than significant	Potentially significant	Potentially significant	EN-1	Less than significant

1 Notes: N/A = not applicable

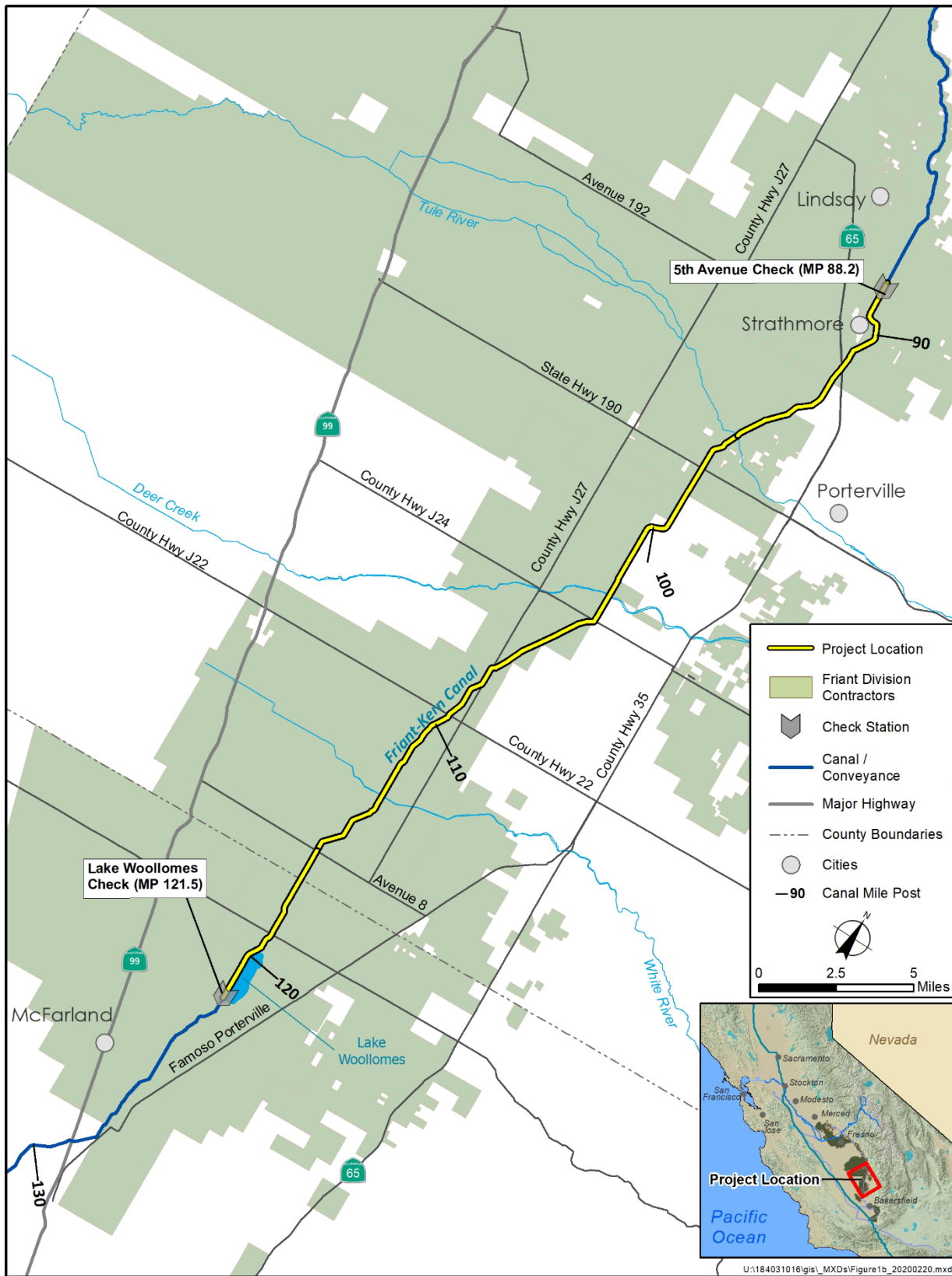
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Chapter 1. Introduction, Purpose and Need, and Project Objectives

In 1942, the Bureau of Reclamation (Reclamation) completed construction of Friant Dam, located on the San Joaquin River (SJR) about 16 miles northeast of Fresno, California as part of the Central Valley Project (CVP). Currently, Friant Dam regulates the flow of the SJR and provides for: downstream releases to meet SJR Restoration Program (SJRRP) Restoration Flow requirements in the SJR; flood control; storage; and releases to the SJR and diversion into the Madera Canal and Friant-Kern Canal (FKC) for delivery of water to more than one million acres of agricultural land in Merced, Madera, Fresno, Tulare, and Kern Counties. Friant Dam serves the CVP Friant Division long-term contractors (Friant Contractors) through three separate river and canal outlets: the SJR, the Madera Canal and the FKC. The FKC conveys water by gravity over 152 miles in a southerly direction from Millerton Lake near the community of Friant to the Kern River four miles west of Bakersfield (Figure 1-1). The Friant Division of the CVP provides supplemental water supplies for agricultural and municipal and industrial uses in Fresno, Tulare, and Kern Counties.

Construction of the FKC began in 1945 and, since completion of construction by Reclamation in 1951, the conveyance capacity of the FKC has been reduced. Reductions are due to regional land subsidence that has occurred over the past decade, original design deficiency, and other factors that prevent the intended flow capacity, resulting in restrictions on water deliveries to the Friant Contractors.

In the 1970s and 1980s, Reclamation made repairs to segments of the FKC to address conveyance capacity restrictions that had resulted from subsidence. Since then, the Middle Reach of the FKC (from mile post [MP] 88 to MP 121.5 [Figure 1-1]) has experienced additional, substantial reduction in conveyance capacity due to continuing subsidence, which has adversely affected water deliveries to some CVP water contractors served by the FKC. In coordination with Reclamation, the Friant Water Authority (FWA), the Operating Non-Federal Entity of the FKC, has proposed to restore the design capacity of the 33-mile-long Middle Reach of the FKC (Figure 1-1). Reclamation and FWA have prepared this joint Final Environmental Impact Statement/Environmental Impact Report (Final EIS/R) pursuant to the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), respectively, to assess and address the effects of the proposed FKC Middle Reach Capacity Correction Project (Project). The designated lead agencies for NEPA and CEQA are Reclamation and FWA, respectively.



1
2 **Figure 1-1. Project Location**

1 San Joaquin River Restoration Settlement and Act

2 In 1988, a coalition of environmental groups led by the Natural Resources Defense Council
3 (NRDC) filed a lawsuit entitled *NRDC et al. v. Kirk Rodgers et al.*, challenging the renewal of
4 long-term water service contracts between the U.S. and the Friant Contractors. NRDC, FWA,
5 and the U.S. Departments of the Interior and Commerce, collectively known as the “Settling
6 Parties,” agreed to the terms and conditions of the Stipulation of Settlement (Settlement). The
7 Settlement established a “Restoration Goal” related to, among other things, releases of water
8 from Friant Dam to the confluence of the Merced River. Actions to achieve the Restoration Goal
9 include a combination of channel and structural modifications along the SJR below Friant Dam,
10 the reintroduction of Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*),
11 and the release of Restoration Flows from Friant Dam. The Settlement also established a “Water
12 Management Goal” that, among other things, is intended to reduce or avoid adverse water supply
13 impacts on Friant Contractors resulting from the release of Restoration Flows.

14 Federal authorization for implementing the Settlement was provided in the Settlement Act
15 (Public Law 111-11, Title X, Part I). Part III of Title X of Public Law 111-11 recognized the
16 need to restore the capacity of the FKC. Section 10201 of Public Law 111-11 states:

17 *(a) The Secretary of the Interior (hereafter referred to as the ‘Secretary’) is authorized*
18 *and directed to conduct feasibility studies in coordination with appropriate Federal,*
19 *State, regional, and local authorities on the following improvements and facilities in the*
20 *Friant Division, Central Valley Project, California:*

21 *(1) Restoration of the capacity of the Friant-Kern and Madera Canal to such capacity*
22 *as previously designed and constructed by the Bureau of Reclamation.*

23 *(b) Upon completion of and consistent with the applicable feasibility studies, the*
24 *Secretary is authorized to construct the improvements and facilities identified in*
25 *subsection (a) in accordance with applicable Federal and State laws.*

26 Hydraulic modeling, completed as part of the *Friant-Kern Canal Capacity Restoration*
27 *Feasibility Report* authorized pursuant to Section 10201(a)(1)³ of the Settlement Act, in Public
28 Law 111-11, confirmed the reduction in FKC capacity in several segments.

29 Reduced conveyance capacity in the FKC Middle Reach reduces the ability to implement
30 provisions of the Water Management Goal and inhibits the ability to manage Restoration Flows
31 due to the increased frequency of flood releases resulting from reduced water deliveries.

³ Section 10201(a)(1) also authorizes evaluation of the restoration of the capacity of the Madera Canal, which will be completed separately.

1 NEPA Purpose and Need

2 The FKC Middle Reach has lost over 50 percent of its original designed and constructed capacity
3 due to regional land subsidence and a design deficiency. This has resulted in water delivery
4 impacts on Friant Contractors, reduced ability of the FKC to convey flood waters during wet
5 years, reduced ability to implement provisions of the Water Management Goal as described in
6 Paragraph 16 of the Settlement, and a reduced ability to store and manage the timing and volume
7 of Restoration Flows in Millerton Lake and flood flows at Friant Dam.

8 The purpose and need of Reclamation’s Proposed Action is to restore the conveyance capacity of
9 the FKC Middle Reach to such capacity as previously designed and constructed by Reclamation,
10 as provided for in Public Law 111-11, Section 10201 and improve operations of existing
11 facilities at Friant Dam consistent with and as allowed for by the Water Infrastructure
12 Improvements for the Nation Act, which will result in fewer spills and uncontrolled releases of
13 water and thus more efficiently use storage capacity in Millerton Lake.

14 CEQA Goals and Objectives

15 The primary goal for the Project is to restore the original design capacity of the Middle Reach of
16 the FKC. The objectives of the Project are as follows:

- 17 • restore capacity to original designed and constructed levels that meet the water supply
18 delivery requirements of the CVP contracts of long-term contractors;
- 19 • restore capacity to convey water for the short-term conveyance of flood flows or non-
20 CVP water as well as provide potential surface water supplies for other users through
21 exchanges and transfers;
- 22 • facilitate accommodation of potential future reductions in conveyance capacity caused by
23 anticipated continued subsidence following Project implementation by designing and
24 maintaining the restored capacity for a service life of at least 50 years; and
- 25 • restore capacity to the maximum extent using the original gravity conveyance design that
26 avoids reliance on additional mechanical facilities and increased energy demands.

27 Agency Coordination

28 Reclamation and FWA are or will be consulting/coordinating with the following agencies
29 regarding the Project:

- 30 • U.S. Fish and Wildlife Service (USFWS) – Consultation under Section 7 of the federal
31 Endangered Species Act (ESA)
- 32 • U.S. Army Corps of Engineers (USACE) – Compliance with 404 of the Clean Water Act
33 (CWA)
- 34 • Central Valley Regional Water Quality Control Board (Regional Water Board) –
35 Compliance with Sections 402 and 401 of the CWA

- 1 • California Department of Fish and Wildlife (CDFW) – Compliance with Section 2081 of
- 2 the California Endangered Species Act and Section 1600 of the California Department of
- 3 Fish and Game Code, Lake or Streambed Alteration Agreement
- 4 • California Department of Transportation (Caltrans) – encroachment within a state
- 5 highway right-of-way (ROW)
- 6 • California State Historic Preservation Officer (SHPO) – Consultation under Section 106
- 7 of the National Historic Preservation Act (NHPA)
- 8 • San Joaquin Valley Air Pollution Control District (SJVAPCD) – federal Clean Air Act,
- 9 Indirect Source Review
- 10 • Tulare County – encroachment within a county ROW
- 11 • Kern County – encroachment within a county ROW
- 12 • Tribes
- 13 • Friant Division Long-Term Contractors

14 **NEPA Cooperating Agencies**

15 On August 27 and 28, 2019, Reclamation sent requests to eight federal and non-federal agencies
16 seeking their participation as Cooperating Agencies pursuant to 42 United States Code Section
17 4332 and 40 Code of Federal Regulations (CFR) 1501.6. Cooperating Agencies are entities that
18 have jurisdiction by law or special expertise regarding a particular project. Reclamation sent
19 cooperating agency request letters to the following agencies: USACE, USFWS, CDFW,
20 Regional Water Board, Caltrans, SJVAPCD, Kern County Public Works, and Tulare County
21 Public Works. The USACE is the only federal agency that accepted the role as a Cooperating
22 Agency and has designated Reclamation as lead federal agency for NEPA, Section 7 of the ESA,
23 and Section 106 of the NHPA associated with their potential permitting actions pursuant to the
24 CWA. The state or local agencies contacted are not continuing as Cooperating Agencies but will
25 continue their involvement as Responsible Agencies pursuant to CEQA.

26

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1 Chapter 2. Description of Alternatives

2 This chapter describes the Project Alternatives, consisting of the No Action/No Project
3 Alternative and two Project Alternatives, the Canal Enlargement and Realignment Alternative
4 (CER Alternative) and the Canal Enlargement Alternative (CE Alternative) and discusses the
5 other Project Alternatives that were considered but eliminated. The CER Alternative is identified
6 as the proposed Project by FWA pursuant to CEQA. Reclamation has identified the CER
7 Alternative as the Preferred Alternative pursuant to NEPA.

8 Appendix B1 provides more technical information on, and detailed illustrations for, the Project
9 Alternatives.

10 Reclamation’s federal discretionary actions associated with both Action Alternatives include
11 implementation, cost-share funding pursuant to the Friant Division Improvements Legislation
12 Public Law 111-11 Section 10201 and the Water Infrastructure Improvements for the Nation Act
13 (Public Law 114-322 Section 4007), issuance of a repayment contract, as well as approvals of
14 actions being conducted within Reclamation’s ROW and any needed land acquisition.

15 Reclamation is the federal lead agency for the proposed Project. However, as noted in Section 1,
16 the USACE is a Cooperating Agency pursuant to NEPA as they may have associated federal
17 action(s) pursuant to the CWA, and those potential authorization(s) are considered part of the
18 Project Alternatives.

19 Existing Conditions

20 The existing conditions are the basis for assessing the significance of project impacts under
21 CEQA. The existing conditions reflect baseline conditions at the time of the release of the Notice
22 of Preparation (December 2019), including infrastructure; water rights and contracts; applicable
23 regulatory requirements; land uses; and relevant current plans and policies. Chapter 3 of this
24 document provides detailed descriptions of the physical environment and existing conditions for
25 each resource area that could be affected by the Project Alternatives. Appendix C provides
26 detailed descriptions of the plans and policies that are relevant to the Project.

27 Under existing conditions, the conveyance capacity through the Middle Reach of the FKC is less
28 than 50 percent of the designed and constructed capacity. Due to conveyance capacity
29 restrictions, FWA has temporarily operated the FKC at a higher water surface level to reduce
30 water delivery impacts. In 2018, a polypropylene liner was placed between MP 103.85 and MP
31 106.32 as part of the temporary, immediate repairs project.

32 As of December 2019, channel capacity constraints in the SJR limit the ability to release full
33 Restoration Flows resulting in Unreleased Restoration Flows that have been made available to
34 Friant Contractors. Historically, the contractors and the property owners within their jurisdiction
35 have had unconstrained use of groundwater; however, implementation of the Sustainable
36 Groundwater Management Act (SGMA), beginning January 2020, could restrict groundwater
37 pumping. Constrained capacity of the FKC Middle Reach reduces water deliveries to Friant
38 Contractors that overlie the Tule and Kern groundwater subbasins. The Groundwater

1 Sustainability Agencies (GSAs) that manage the groundwater basins have approved, submitted,
2 and are in the initial stage of implementing their Groundwater Sustainability Plans (GSPs).

3 **No Action/No Project Alternative**

4 The No Action/No Project Alternative (No Action Alternative) is required for the analysis of
5 impacts in accordance with both NEPA and CEQA. The No Action Alternative is based on
6 projected conditions that would exist in the year 2070 if the Project is not implemented, and,
7 under NEPA, serves as the baseline to which the effects of the Project Alternatives are
8 compared. The year 2070 is used as the projected condition because both Project Alternatives are
9 designed to correct for anticipated future subsidence through 2070. The No Action Alternative is
10 defined based on the affected environment/existing conditions and reflects changes that would
11 result from actions that could occur in the Project area in the future that currently do not exist in
12 the Project area and that do not rely on approval or implementation of the Project. Differences
13 between existing conditions and anticipated future conditions without the Project are detailed for
14 each resource, as appropriate. A detailed description of the No Action Alternative is provided in
15 Appendix B1.

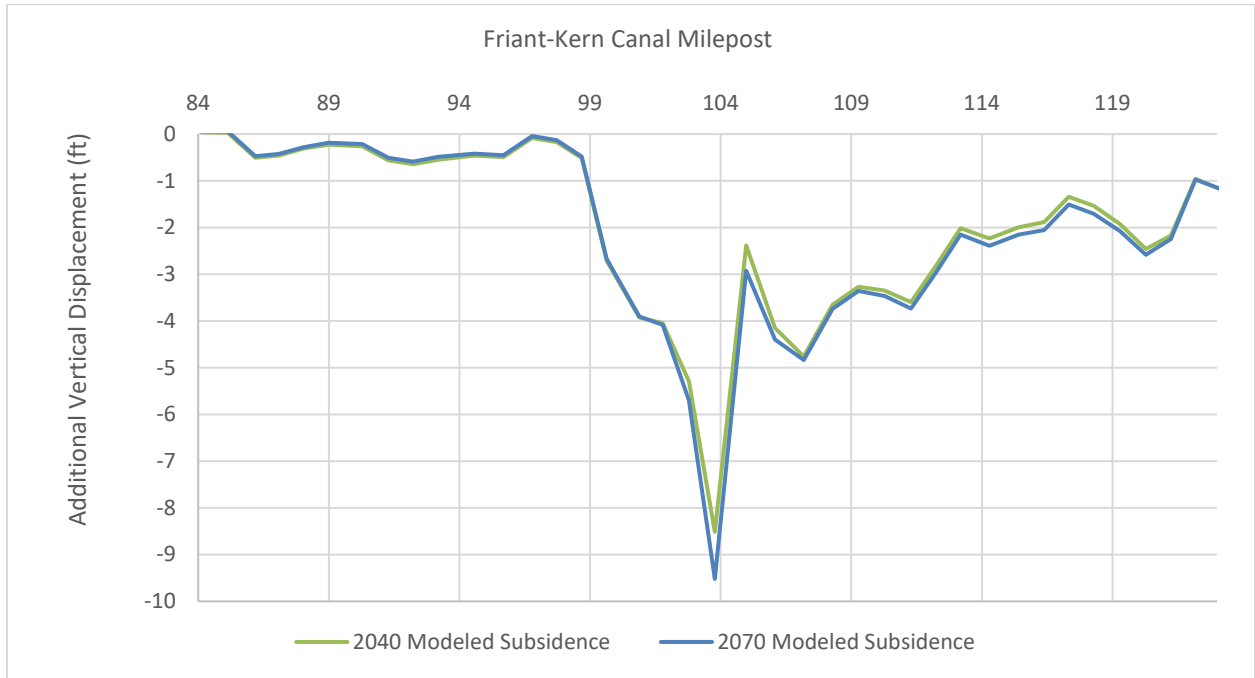
16 Under the No Action Alternative, Reclamation and FWA would not take additional actions
17 towards restoring the capacity of the FKC Middle Reach. The following reasonably foreseeable
18 actions have been identified that will affect future conditions in the Project area:

- 19 1) Implementation of SJR channel improvements as required by the Settlement would
20 continue through 2025, resulting in the ability to release full Restoration Flow water
21 quantities in the SJR, reducing the availability of Unreleased Restoration Flows thus
22 reducing the overall water supply available for diversion to the FKC and delivery to
23 Friant Contractors.
- 24 2) Projected additional subsidence, as shown in Figure 2-1, would further reduce the
25 capacity of the FKC Middle Reach (see Attachment A of Appendix B1). This would also
26 diminish CVP water supplies to some Friant Contractors; it is estimated that deliveries
27 would be reduced nearly 180,000 acre-feet (AF) annually by 2070.
- 28 3) Full compliance with SGMA by 2040 could restrict groundwater pumping and preclude
29 the ability of Friant Contractors and the property owners within their jurisdiction to offset
30 curtailed FKC water deliveries with additional supplemental groundwater supplies;
- 31 4) Friant Division long-term contractors would attempt to minimize water delivery impacts
32 caused by reduced capacity by rescheduling allocated CVP water supplies in available
33 storage in Millerton Lake for delivery at a later time to the extent possible.

34 **Project Alternatives**

35 The two proposed Project Alternatives have been designed based on projected land surface in
36 2070, developed by Harder (2018) (see Attachment C in Appendix B1) and would continue to
37 provide design capacity as future subsidence occurs. As per Public Law 111-11, the designed

1 flow rates of the Project Alternatives would restore the capacity of the Middle Reach of the FKC
 2 to the original design rates (Table 2-1). Design of the Project Alternatives will also consider
 3 additional future subsidence that is expected to occur within the Project area. Figure 2-2
 4 illustrates the general components of each Project Alternative, which are described below.



5
 6 (Harder 2018)

7 **Figure 2-1. Projected Land Surface Elevation Change in 2040 and 2070 Along the Friant-**
 8 **Kern Canal Middle Reach.**

9 **Table 2-1. Design Flow Rates for the Middle Reach of the FKC**

Canal Segment No.	Canal Segment (MP to MP)	Segment Location Description	Design Flow Rate (cfs)
1	88.2 to 95.6	5th Avenue to Tule River	4,500
2	95.6 to 102.6	Tule River to Deer Creek	4,000
3	102.6 to 112.9	Deer Creek to White River	4,000
4	112.9 to 121.5	White River to Woollomes	3,500

10 Key: cfs = cubic feet per second; MP = mile post

11 **Canal Enlargement and Realignment Alternative (CER Alternative)**

12 The CER Alternative (Proposed Project/Preferred Alternative) would restore the FKC design
 13 capacity using two methods: (1) raising portions of the embankments of the existing FKC, and
 14 (2) constructing a realigned canal segment east of the existing FKC (see the “Canal Enlargement
 15 and Realignment Alternative” section and Attachment A in Appendix B1).

- 1 • **Canal Enlargement** – The existing canal would be enlarged by raising the lining up to
2 four feet in Segment 1 from MP 88.2 (at Avenue 208) to MP 95.7 (immediately south of
3 Tule River) and in Segment 4 from MP 116.0 (at Avenue 8) to MP 121.5 (at the Lake
4 Woollomes check), for a total of about 13 miles.
- 5 • **Canal Realignment** – The realigned canal segment would be constructed immediately
6 east of the existing FKC and would serve as the exclusive water conveyance and delivery
7 mechanism through its length. Most of the existing FKC adjacent to the new realigned
8 canal segment would remain in place but would be taken out of active service; limited
9 portions would be preserved for delivery pools at pump station turnouts. The realigned
10 segment would extend about 20 miles from MP 95.7 to MP 116, which encompasses all
11 of Segments 2, 3, and a portion of Segment 4. For those portions removed from
12 conveyance service, FWA would continue to operate and maintain the canal consistent
13 with their Operations, Maintenance, and Repair (OM&R) Agreement with Reclamation
14 and Reclamation regulations.

15 **Canal Enlargement Alternative (CE Alternative)**

16 The CE Alternative would restore the FKC design capacity using two methods: (1) raising
17 portions of the embankments of the existing FKC, and (2) raising and widening portions of the
18 embankments of the existing FKC (see the “Canal Enlargement Alternative” section and
19 Attachment B in Appendix B1).

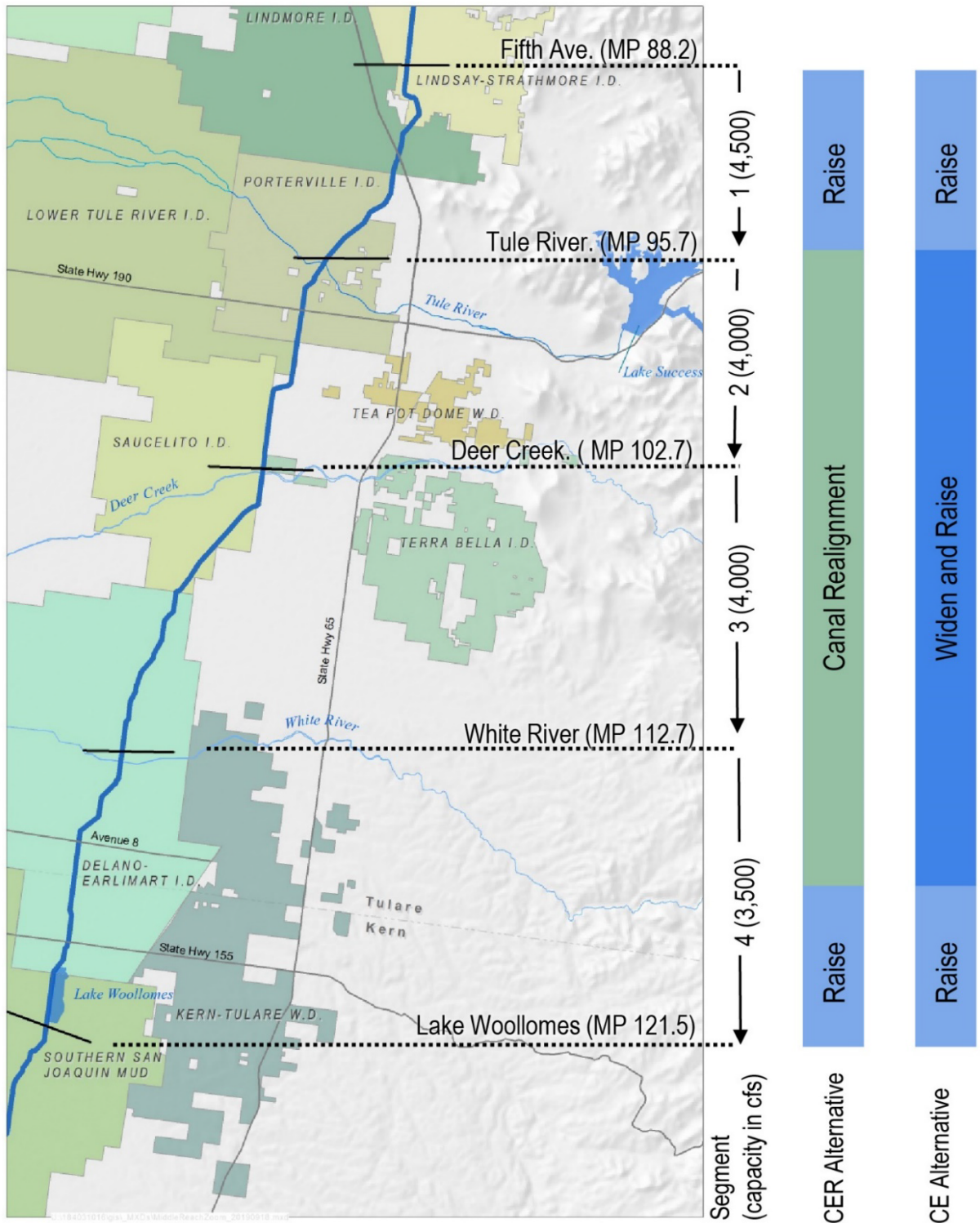
- 20 • **Canal Raising** – The existing canal would be enlarged by raising the lining up to four
21 feet in Segment 1 from MP 88.2 to MP 95.7 and in Segment 4 from MP 116.0 to MP
22 121.5, for a total of about 13 miles.
- 23 • **Canal Raising and Widening** – The existing canal would be enlarged by raising the
24 embankments up to 15 feet and widening the canal (approximately 28 feet wide on each
25 embankment or a total of 56 feet wide) in Segments 2, 3, and a portion of Segment 4
26 from MP 95.7 to MP 116, about 16 total miles. Short sections (between 0.25 and up to
27 2.2 miles) of a bypass canal would be constructed as part of this alternative within this
28 reach, totaling approximately four miles.

29 **Features Common to Both Project Alternatives**

30 Both the CER and the CE Alternatives would include similar additional features, as listed below.
31 Table 2-2 provides a summary of Project features for each Alternative.

- 32 • **Turnouts** – Both Project Alternatives must maintain water deliveries to irrigation
33 districts through existing distribution systems via turnouts. The existing turnouts vary in
34 size and configuration, and they supply water to both gravity-fed and pressurized
35 systems. The pressurized systems depend on pump stations to draw water from the FKC
36 and pump it into irrigation districts’ systems. The approach to retrofitting or constructing
37 turnouts varies by location and configuration. Turnouts in the canal enlargement portion
38 would either remain unchanged or the top deck would be raised (deck raise) one to four
39 feet depending on the location. In the canal realignment/canal widening and raising
40 portion of each alternative, gravity turnouts would be replaced, and new delivery pool
41 turnouts would be constructed for pressurized turnouts (see the “Turnouts” section in
42 Appendix B1).

- 1 • **Road Crossings** – Road crossings within the Project area would either be left in place or
2 replaced with a concrete box siphon or trapezoidal bridge, depending on the location and
3 alternative (see the “Road Crossings” section in Appendix B1).
- 4 • **Checks and Siphons** – The Check structures near Deer Creek and White River are flow
5 control devices placed in the FKC to regulate flow and increase head in the upstream
6 canal segments to ensure deliveries at gravity turnouts. Their associated siphons divert
7 canal flow below Deer Creek and White River. Both Project Alternatives would require
8 replacement of these check structures, wasteways, and siphons (see the “Check
9 Structures” section in Appendix B1).
- 10 • **Utilities** – Depending on the location and extent of canal modifications, utilities like
11 overhead power lines, adjacent wells, culverts and elevated pipeline canal crossings
12 would be relocated, replaced, or extended (see the “Other Infrastructure” section in
13 Appendix B1).
- 14 • **Concrete Batch Plant** - A concrete batch plant would be built onsite for construction of
15 canal linings for both alternatives. The batch plant would be located on a 30-acre parcel
16 on Avenue 56 near the FKC in Tulare County (see Figure 1-22 in Appendix B1). The
17 property would also be used for contractor staging, offices, and equipment and material
18 storage.



1

2 **Figure 2-2. Project Alternatives**

3

1 **Table 2-2. Features of Project Alternatives**

Design Feature	CER	CE
Raised canal	13 miles	13 miles
New canal alignment/bypass canal	20.3 miles	to 4 miles ¹
Raised and widened canal	-	16.3 miles
Turnouts		
Deck raise	15 each	26 ² each
New turnout (gravity system)	10 each	-
New delivery pool turnout (pressurized system)	13 each	10 each
Road crossings	21 concrete box siphons	13 trapezoidal bridges 8 concrete box siphons
Check structures and siphon replacements	two each	two each
Utilities		
Overhead powerlines	Relocate four miles	Relocate seven miles
Groundwater well abandonment	seven wells	10 wells
Culvert extensions	10 each	10 each
Pipeline overcrossing relocations	six crossings	six crossings
Total Area Impacted	2,197 acres ³	1,918 acres
New ROW acquired	510 acres	144 acres
Borrow Material	2.5 million cubic yards	6 million cubic yards

2 Notes:

3 ¹ The bypass canal would consist of several small segments of canal between 0.25 and 2.2 miles totaling about 4
4 miles of new bypass canal.

5 ² One location for the CE Alternative requires only a minor modification to the existing pipe, not a complete deck
6 raise.

7 ³ The total area impacted consists of both temporary (contractor staging areas) and permanent (realigned/bypass
8 canal) project features.

9 **General Construction Practices**

10 Construction of the CER Alternative would take about three years and would be continuous.
11 Construction of the CE Alternative would take about 10 years and would be intermittent because
12 of the need to shut down the canal to accommodate construction in the existing canal.
13 Construction would begin with the relocation of facilities adjacent to the FKC (for example,

1 utilities and wells) and excavation associated with the replacement check structures, siphons, and
2 the realigned canal for the CER Alternative. Given the linear nature of the Project, construction
3 activities would not be constant at any individual location. It is expected that the maximum
4 duration of construction for any one Project element (Deer Creek or White River check
5 structures and siphons) would be about seven months.

6 The durations for construction of major facilities are expected to be as follows:

- 7 • Existing utility relocation and well abandonment: four months
- 8 • Deer Creek and White River check structures: seven months each (14 months total)
- 9 • Road crossings: four crossings constructed simultaneously over an approximately three-
10 month period (14 months total for all 21 crossings)
- 11 • Realigned canal (CER Alternative): 16 months (continuous)
- 12 • Canal raising and widening (CE Alternative): 24 months (three-month intermittent
13 construction periods over eight years)
- 14 • A concrete batch plant that would primarily be used for construction of the canal lining
15 would be built onsite. The batch plant would be located on a 30-acre parcel on Avenue 56
16 near the FKC in Tulare County (Figure 1-22 in Appendix B1). The batch plant site would
17 also be used for contractor staging, offices, and equipment and material storage and
18 would be in use for the duration of construction under both alternatives. Asphalt for the
19 new roads would be obtained from regional commercial sources.

20 Construction would generally occur between 7:00 a.m. and 7:00 p.m. Monday through Friday.
21 Occasional evening and weekend work could occur, as needed; however, the work would be
22 conducted to minimize disturbance to neighboring properties (e.g., lighting would be pointed
23 away from residences) and would occur in coordination with Tulare County, Kern County, and
24 the City of Porterville, as appropriate. Work crews would consist of up to nine construction
25 teams, with 15 to 30 people per team. Depending on Project construction requirements, up to 150
26 workers could be onsite during peak construction periods.

27 **Comparison of Existing Conditions with Project Alternatives**

28 A comparison of existing conditions with the No Action Alternative and the two Project
29 Alternatives is provided in Table 2-3.

30

1 **Table 2-3. Comparison of Existing Conditions, the No Action Alternative, and Project**
 2 **Alternatives**

Comparison Criteria	Existing Conditions	No Action Alternative (expected conditions in 2070)	CER Alternative	CE Alternative
Estimated Maximum conveyance capacity in the Middle Reach of the FKC	1,323 cfs	500 cfs	4,000 cfs	4,000 cfs
Average annual affected water supply	27,083 AF per year	179,083 AF per year	0 AF per year	0 AF per year
SJRRP implementation	Release of Restoration Flows to the SJR as limited by SJR channel capacity; Unreleased Restoration Flows made available	Release of full Restoration Flow volume to the SJR; Unreleased Restoration Flows no longer made available	Release of full Restoration Flow volume to the SJR; Unreleased Restoration Flows no longer made available	Release of full Restoration Flow volume to the SJR; Unreleased Restoration Flows no longer made available
Estimated annual deliveries to Friant Contractors by the FKC	904 TAF	702 TAF	848 TAF	848 TAF
Delivery of CVP water supplies to Friant Contractors served by the FKC	Potential reduction in delivery of RWA/215 ¹ and Class 2 ¹ water supplies	Reduction in RWA/215 ¹ , Class 2 ¹ , and Class 1 ¹ water supplies	No reductions	No reductions
Rescheduling in Millerton Lake of CVP Friant Division water deliveries that cannot be conveyed due to reduced capacity in the Middle Reach of the FKC	Reschedule water to extent possible, with remaining flows into SJR as flood releases	Reschedule water to extent possible, with remaining flows into SJR as flood releases	No rescheduling necessary due to capacity correction in Middle Reach	No rescheduling necessary due to capacity correction in Middle Reach
SGMA Implementation	Not implemented	Implementation beginning in 2020; sustainable groundwater management achieved by 2040	Implementation beginning in 2020; sustainable groundwater management achieved by 2040	Implementation beginning in 2020; sustainable groundwater management achieved by 2040
Groundwater pumping	Supplemental groundwater pumping to replace reductions in delivery of CVP water supplies resulting from reduced capacity in the Middle Reach of the FKC	Potentially reduced groundwater pumping due to SGMA implementation	Potentially reduced groundwater pumping due to SGMA implementation	Potentially reduced groundwater pumping due to SGMA implementation

3 ¹ The water supply contract structure for the Friant Division implemented by Reclamation supports the conjunctive
 4 management of surface water and groundwater. Class 1 contracts are up to the first 800 TAF of dependable water

1 supply and are assigned to agricultural and urban water users who have limited access to good quality groundwater.
2 Class 2 contracts allow up to 1,401 TAF and are considered undependable in nature; Class 2 water supply is
3 available only when Reclamation's Contracting Officer makes a declaration of availability. Class 2 water supply
4 supports regional conjunctive use and provides water supplies for groundwater replenishment during wetter years.
5 Friant Contractors can obtain surface water in accordance with Section 215 of the Reclamation Reform Act of 1982
6 and under the provisions of Paragraph 16(b) of the Settlement. Under Section 215, Reclamation is authorized to
7 deliver water that cannot be stored in Friant Dam and otherwise would be released (spilled) from Friant Dam in
8 accordance with flood management criteria or unmanaged water supplies.

9 Key: AF = acre-feet; cfs = cubic feet per second; RWA = Regional Water Authority; SJR = San Joaquin River;
10 SJRRP = San Joaquin River Restoration Plan; TAF = thousand acre-feet

11 **Alternatives Considered but Eliminated**

12 Through an evaluation and comparison of initial alternatives as part of the federal Feasibility
13 Study that was conducted by Reclamation and FWA (Reclamation 2020), four additional
14 alternatives were considered and eliminated from further consideration. These include
15 alternatives that considered pumping plants in two different locations, and a canal enlargement
16 combined with a remote bypass canal at two different lengths (described as Option A and Option
17 B). The following sections briefly describe each of the initial alternatives considered but
18 eliminated from further consideration and explain why they were eliminated.

19 **Pump Station at Milepost 109**

20 This alternative would change the FKC from a gravity canal to a pumped canal. The principle
21 feature of this alternative would be a 2,000 cubic feet per second (cfs) pump station installed in
22 the FKC at MP 109. The pump station would be equipped with eight 250 cfs capacity pumps.
23 When required flows cannot be conveyed by gravity, water would be diverted from the existing
24 canal at MP 109 into a forebay, then pumped back into the canal. A 400-acre emergency
25 reservoir would be constructed adjacent to the pumping plant to store water should a surge occur
26 in the event of a power failure.

27 This alternative was eliminated from further consideration because it would introduce a large-
28 capacity pump station to a system that was designed as a gravity conveyance system and has
29 operated as such for over 70 years. Pump station operations must accommodate unplanned power
30 outages that are not uncommon in the Project area and would introduce significant water supply
31 reliability issues that are not associated with the current gravity conveyance system. During
32 power outages, water supply deliveries would be significantly reduced downstream of the pump
33 station. FWA does not currently own or operate a large-capacity pump station, and introduction
34 of this major infrastructure would require additional OM&R staff specially trained in pump
35 stations, and would result in significant increased operational complexity.

36 A substantial amount of land would be needed for the construction of an emergency storage
37 reservoir to accommodate unplanned water surges when power outages occur. The reservoir
38 would remain empty the majority of the time and would be a maintenance, aesthetic, and air
39 quality (fugitive dust) concern. Additionally, introduction of pump station(s) would not in itself
40 restore the canal capacity as originally designed; this alternative would therefore not meet the
41 purpose and need or objectives of the Project. Many of the same measures (i.e., canal
42 enlargement) that are included in the two Project Alternatives would also be required for this
43 alternative so it would not reduce potential environmental impacts.

1 **Pump Station at Woollomes**

2 This alternative would restore canal conveyance capacity through a combination of canal
3 enlargement, a pump station, and a bypass canal. Capacity restoration would be achieved by
4 moving water from the original canal into a 10-mile-long bypass canal beginning at MP 109 and
5 lifting it through a 2,000 cfs pump station at MP 119. A 350-acre emergency reservoir would be
6 constructed adjacent to the pumping plant to store water from a water surge in the event of a
7 power failure. Deliveries would be maintained in the original canal, but the majority of the water
8 would move through the bypass canal.

9 This alternative was eliminated from consideration for reasons similar to those described above
10 for the Pump Station at Milepost 109 alternative. In addition, the 10-mile-long bypass canal
11 would bisect many parcels of land that are used extensively for farming, disrupting the
12 agricultural operations of numerous private landowners and resulting in strips of lands being
13 isolated between the existing FKC and the new bypass canal. Access for farming operations
14 within this area would be significantly affected and land values for the isolated parcels would
15 decrease.

16 Maintenance would be required within the existing FKC along the bypassed portion, as it would
17 continue to be used for water deliveries. In addition, there would be increased operational
18 complications and considerably higher OM&R costs resulting from the operation of two canals.
19 As regional subsidence continues, additional modifications to the canal embankments and lining,
20 turnouts and bridges in the bypassed portion of the FKC would be required to preserve delivery
21 capability. Many of the same measures (i.e., canal enlargement, replacement check structure at
22 White River) that are included in the two proposed Project Alternatives would also be required
23 for this alternative so it would not reduce environmental impacts.

24 **Bypass Canal from Tule River to White River or Woollomes (Options A and B)**

25 This alternative includes an offset bypass canal that would move water into a new canal at Tule
26 River and connect back into the existing FKC approximately 17 miles downstream, immediately
27 upstream of the White River check (Option A) with an option to extend the bypass canal up to 23
28 miles downstream to Woollomes (Option B). The offset bypass canal would be located upslope
29 and to the east of the existing FKC. This alternative was developed with the intent of avoiding
30 the area along the existing FKC that has experienced the greatest amount of subsidence. The
31 existing canal would remain in operation and be used to maintain deliveries between the two
32 checks (either Tule River to White River or Tule River to Woollomes).

33 Both options for this alternative were eliminated from consideration because, similar to the Pump
34 Station at Woollomes alternative, the bypass canal would bisect numerous parcels of land that
35 are used extensively for farming. Groundwater modeling results demonstrated that potential
36 future subsidence in the area of the new bypass canal would not be significantly different than
37 that immediately adjacent to the existing FKC. The new bypass canal under this alternative
38 cannot be located far enough to the east to be out of the area of potential future subsidence
39 without compromising the gravity operation of the canal and would require the installation of a
40 pump station.

41 There would be increased operational complications and considerably higher OM&R costs
42 resulting from the operation of two canals for the 17 to 23-mile length of the bypass canal.

1 Maintenance would be required within the existing FKC along the bypassed portion since it
 2 would continue to be used for water deliveries. As regional subsidence continues, additional
 3 modifications to embankments and lining turnouts and bridges in the bypassed portion of the
 4 FKC may be required to preserve delivery capability. Many of the same measures (i.e., canal
 5 enlargement, replacement check structure at Deer Creek [and White River for Option B]) that are
 6 included in the two Project Alternatives would also be required for this alternative so it would
 7 not reduce environmental impacts.

8 **Environmental Commitments/Mitigation Measures**

9 Environmental commitments (ECs) are measures or practices adopted by or imposed on a project
 10 proponent to reduce or avoid adverse effects that could result from a proposed project. These
 11 measures, described as ECs under NEPA, are included as part of the Project Alternatives and are
 12 based on adopted rules or regulations; regulatory agency plans, policies, or programs; or
 13 accepted industry standards (“best practices”). In most cases, the ECs are synonymous with
 14 mitigation measures (MMs) under CEQA; however, for some resources, ECs have been
 15 proposed even when impacts are deemed “less than significant” under CEQA to avoid or reduce
 16 potential impacts. The following sections describe the ECs and MMs that would be implemented
 17 under the Project Alternatives and associated mitigation and monitoring plans to avoid
 18 potentially significant adverse environmental consequences. The measures are numbered to
 19 correspond with the appropriate impact numbers that are used in the respective impact analyses
 20 contained in Chapter 4. ECs/MMs may be used across resources or to mitigate additional impacts
 21 within the same resources; therefore, numbering of ECs/MMs may not be sequential. The full
 22 text of all ECs and MMs is available in Appendix B2.

23 Public Resources Code Section 21081.6 requires a Lead Agency to adopt a Mitigation
 24 Monitoring and Reporting Plan (MMRP) when it approves a project for which measures to
 25 mitigate or avoid significant effects on the environment are required. The purpose of the MMRP
 26 is to ensure compliance with the mitigation measures during project implementation. Appendix
 27 M of this EIS/R includes the Project MMRP.

28 **Environmental Commitments**

29 Biological Resources

30 BIO-11.5: Construct San Joaquin kit fox artificial dens.

31 Land Use and Planning and Agricultural Resources

32 AG-2 Complete nonrenewable process for lands enrolled in Williamson Act
 33 contracts.

34 Noise

35 NOI-1 Implement noise-reducing measures during construction.

36 **Mitigation Measures**

37 Air Quality

38 AQ-1 Implement measures to reduce construction emissions.

39 AQ-2 Enter into a Voluntary Emissions Reduction Agreement.

1	Biological Resources	
2	BIO-1a.1-a.3	Measures to minimize effects on special-status plants.
3	BIO-1b.1-1b.7	Measures to minimize effects on special-status animal species.
4	BIO-1c.1-1c.3	Measures to minimize effects on nesting migratory birds.
5	BIO-1d.1-1d.3	Measures to minimize effects on burrowing owl.
6	BIO-1e.1-1e.4	Measures to minimize effects on golden eagle, Swainson’s hawk,
7		northern harrier, and white-tailed kite.
8	BIO-1f.1-1f.2	Measures to minimize effects on bats.
9	BIO-1g	Measures to minimize effects on Kern brook lamprey, San Joaquin
10		roach, and game fish.
11	BIO-1h.1-1h.2	Measures to minimize effects on western spadefoot.
12	BIO-1i	Measures to minimize effects on northern California legless lizard,
13		California glossy snake, San Joaquin coachwhip, and coast horned
14		lizard.
15	BIO-1j.1-j.4	Measures to minimize effects on Buena Vista Lake shrew.
16	BIO-1k	Measures to minimize effects on American badger.
17	BIO-1l.1-1l.4	Measures to minimize effects on San Joaquin kit fox.
18	BIO-2a-2c	Measures to minimize effects on sensitive natural communities.
19	BIO-3a-3d	Measures to minimize effects on an intermittent stream channel and
20		riparian wetland.
21	Cultural Resources	
22	CUL-1	Implement Reclamation’s amended Programmatic Agreement for the
23		treatment of the FKC.
24	CUL-2	Protocol for handling inadvertent discovery of subsurface cultural or
25		human artifacts.
26	CUL-3	Protocol for handling inadvertent discovery of human remains.
27	Geology and Soils	
28	GEO-1	Perform geotechnical studies prior to completion of Project design.
29	GEO-2-1	Prepare site-specific stormwater pollution prevention plan.
30	GEO-2-2	Prepare for unexpected failures of erosion control measures.
31	GEO-2-3	Stabilize disturbed portions of FKC.
32	GEO-5	Protect paleontological resources encountered during ground-
33		disturbing activities.
34	Hazards and Hazardous Materials	
35	HAZ-1-1	Implement measures to avoid or reduce the potential for accidental
36		spills.
37	HAZ-1-2	Implement measures to reduce construction-related impacts from
38		asbestos removal.
39	HAZ-1-3	Implement measures to reduce construction-related impacts from lead-
40		contaminated materials.
41	Land Use	
42	AG-1	Conserve agricultural lands.

- 1 Transportation
- 2 TRAN-1-1 Clearly mark detour routes for all road closures during construction.
- 3 TRAN-1-2 Prepare a Traffic Control Plan.
- 4 TRAN-2 Notify emergency dispatchers of road closures.

- 5 Utilities and Service Systems and Energy
- 6 EN-1 Prepare a Construction Equipment and Vehicle Efficiency Plan.

Chapter 3. Affected Environment/ Environmental Setting

Introduction

This section provides detailed descriptions of the physical environment and existing conditions that could be affected by the Project Alternatives as required by 40 CFR Section 1502.15 and CEQA Guidelines Section 15125. For each resource area, Appendix C, “Regulatory Setting,” presents the federal, state, and local laws, regulations, policies, and plans that are relevant and applicable to the affected environment, area of analysis, and analysis of impacts and provides discussion on how these laws, regulations and policies would be directly or indirectly addressed during implementation of the Project Alternatives.

Reclamation and FWA prepared an Environmental Assessment/Initial Study (EA/IS) that provided an initial review of potential impacts associated with the Project. Pursuant to the EA/IS, Reclamation and FWA determined that the Project would have no impact or less-than-significant impacts on the following resources or topics: aesthetics, mineral resources, population and housing, public services, recreation, environmental justice, Indian Trust Assets, Indian Sacred Sites, and socioeconomics. The EA/IS, included as Appendix D, provides explanations for why these resource topics are not discussed further in this Final EIS/R.

Air Quality

Regional Topography, Meteorology, and Climate

The Project area is located in the San Joaquin Valley Air Basin (SJVAB), which occupies the southern half of the Central Valley and comprises eight counties: San Joaquin, Stanislaus, Fresno, Merced, Madera, Kings, Tulare, and portions of Kern County. The SJVAB is approximately 250 miles long and 35 miles wide (on average) and is bordered by the Coast Ranges to the west, the Sierra Nevada to the east, and the Tehachapi Mountains to the south.

Although marine air generally flows into the SJVAB from the San Francisco Bay Area through the Carquinez Strait (a gap in the Coast Ranges) and low mountain passes such as the Altamont and Pacheco Passes, the mountain ranges restrict air movement through the SJVAB.

Additionally, most of the surrounding mountains are above the normal height of summer inversion layers (1,500 to 3,000 feet). These topographic features result in weak and poor dispersion of pollutants, and, as a result, the SJVAB is highly susceptible to pollutant accumulation.

Air Pollutants of Concern

The National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) are established for six criteria pollutants: ozone, carbon monoxide (CO), lead, nitrogen dioxide, sulfur dioxide, and particulate matter (PM). Criteria pollutants, as well as additional air pollutants of concern, toxic air contaminants (TACs) and diesel particulate matter (DPM), are discussed in Appendix E.

Attainment Status

Local monitoring data are used to designate areas as nonattainment, maintenance, attainment, or unclassified under the NAAQS and CAAQS. The attainment status for both Tulare and Kern Counties is provided in Table 3-1. The four designations are defined as follows.

- Nonattainment: assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- Maintenance: assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- Attainment: assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- Unclassified: assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question.

Table 3-1. Tulare and Kern Counties State and Federal Attainment Status

Criteria Pollutant	State Designation (Tulare)	Federal Designation (Tulare)	State Designation (Kern)	Federal Designation (Kern)
Ozone – One hour	Nonattainment	No Federal Standard ¹	Nonattainment	No Federal Standard ¹
Ozone – Eight Hour	Nonattainment	Nonattainment/Extreme ²	Nonattainment	Nonattainment ²
PM ₁₀	Nonattainment	Attainment ³	Nonattainment	Attainment ³
PM _{2.5}	Nonattainment	Nonattainment ⁴	Nonattainment	Nonattainment ⁴
Carbon monoxide	Attainment/ Unclassified	Attainment/Unclassified	Attainment/Uncla ssified	Attainment/Unclassified
Nitrogen dioxide	Attainment	Attainment/Unclassified	Attainment	Attainment/Unclassified
Sulfur dioxide	Attainment	Attainment/Unclassified	Attainment	Attainment/Unclassified
Lead	Attainment	No Designation/ Classification	Attainment	No Designation/ Classification
Hydrogen sulfide	Unclassified	No Federal Standard	Unclassified	No Federal Standard
Sulfates	Attainment	No Federal Standard	Attainment	No Federal Standard
Visibility reducing particles	Unclassified	No Federal Standard	Unclassified	No Federal Standard
Vinyl Chloride	Attainment	No Federal Standard	Attainment	No Federal Standard

Key: PM_{2.5} = particulate matter 2.5 microns or less in diameter; PM₁₀ = particulate matter 10 microns or less in diameter

¹ Effective June 15, 2005, the U.S. Environmental Protection Agency (EPA) revoked the federal 1-hour ozone standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

² Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

³ On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM₁₀ National Ambient Air Quality Standard (NAAQS) and approved the PM₁₀ Maintenance Plan.

1 ⁴ The Valley is designated nonattainment for the 1997 PM_{2.5} NAAQS. EPA designated the Valley as nonattainment
2 for the 2006 PM_{2.5} NAAQS on November 13, 2009 (effective December 14, 2009).
3 Sources: CARB 2019, EPA 2019

4 **Sensitive Receptors**

5 In the Project area, sensitive receptors⁴ are generally concentrated around Strathmore and
6 Porterville. There are five schools located within 0.25 mile of the FKC: Strathmore Elementary
7 School and Strathmore Middle School in Strathmore; and William R. Buckley Elementary
8 School, Burton Middle School, and Summit Charter Academy in Porterville. All five schools are
9 located in the northern part of the Project area, north of the Tule River. There are no schools
10 located within a 0.25-mile distance of the Project area south of the Tule River. Residences south
11 of the Tule River are sporadic, but generally consist of single-family residences associated with
12 agricultural areas spread out along the FKC. There are no hospitals, nursing homes, churches,
13 libraries, or other typical noise-sensitive receptors within 500 feet of the Project area.

14 **Biological Resources**

15 A biological resources assessment (BRA) was prepared to identify special-status species and
16 other sensitive biological resources that may occur in or near the Project area (Appendix F). The
17 BRA is based on information gathered from a review of desktop resources including published
18 literature, data, and maps; and from biological field surveys that were conducted in April,
19 September, October, November, December 2019, and March 2020. The environmental setting
20 and impact analysis in this section is a synopsis of the detailed information presented in the
21 BRA.

22 **Local Setting and Existing Land Uses**

23 The Project area encompasses approximately 33 linear miles and includes all areas proposed for
24 construction, staging, and borrow activities. The Project area consists primarily of barren,
25 ruderal, or agricultural land and roadways on the east and west sides of the FKC. Land uses
26 surrounding the immediate vicinity consist primarily of agriculture. The dominant crops are
27 grapes, citrus, kiwis, almonds, and pistachios. There are isolated areas adjacent to the FKC that
28 are zoned for light manufacturing, residential, and rural residential.

29 The FKC runs along the eastern edge of the southern Central Valley in nearly level terrain.
30 Elevations in the Project area range from approximately 400 to 422 feet above mean sea level.
31 The Project area has a Mediterranean climate characterized by hot, dry summers and moderate
32 winters. The natural habitat communities in the Project area include non-native annual grassland,
33 California buckwheat scrub, allscale saltbush scrub, Fremont cottonwood forest, mulefat
34 thickets, red willow thickets, shining willow groves, smartweed-cocklebur patches, and valley
35 oak woodland. Of these, valley oak woodland, red willow thickets, shining willow groves, and
36 Fremont cottonwood forest are classified as sensitive natural communities by CDFW's
37 California Natural Diversity Database (CNDDDB). Aquatic habitats in the study area include

⁴ SJVAPCD defines a sensitive receptor as: *People that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling unit(s)* (SJVAPCD 2015).

1 FKC, intermittent stream (Porter Slough, Tule River, Deer Creek, White River), pond, fresh
 2 emergent wetland, riparian wetland, seasonal wetland, irrigation canal, irrigation ditches, and
 3 groundwater recharge basins. Porter Slough, Tule River, Deer Creek, and White River are
 4 intermittent streams that cross the Project area and may provide dispersal and migration corridors
 5 for regionally occurring plant and animal species. There is potential aquatic habitat for Kern
 6 brook lamprey and game fish (e.g., catfish, bass) in the FKC and San Joaquin roach in the
 7 intermittent streams.

8 Managed plant crops in the Project area include irrigated row crops, vineyards, orchards, and
 9 herbaceous field crops (alfalfa). Portions of the Project area under agricultural management were
 10 not active at the time of the vegetation mapping and were classified as fallow lands (unsown).
 11 Additional land/habitat designations within the Project area include the following: urban
 12 (residential housing), ruderal (recently and/or regularly disturbed areas), barren (unvegetated or
 13 nearly unvegetated areas including levee roads), and open water (Appendix F, Figure 3).
 14 Descriptions of each land/habitat designation are provided in Section 5.2 of Appendix F.

15 **Special-Status Plant Species**

16 CNNDDB special-status plant species occurrences within five miles of the Project area are
 17 illustrated in Appendix F, Figure 4. Based on the assessment of habitats in the Project area, 10
 18 special-status plant species have a potential to occur. These species are Earlimart orache
 19 (*Atriplex cordulata* var. *erecticaulis*), Lost Hills crownscale (*Atriplex coronata* var. *vallicola*),
 20 brittlescale (*Atriplex depressa*), lesser saltscale (*Atriplex minuscula*), subtle orache (*Atriplex*
 21 *subtilis*), recurved larkspur (*Delphinium recurvatum*), Hoover's eriastrum (*Eriastrum hooveri*),
 22 spiny-sepaled button-celery (*Eryngium spinosepalum*), Munz's tidy-tips (*Layia munzii*), and
 23 California alkali grass (*Puccinellia simplex*). All of these species are associated with annual
 24 grassland habitats, and are further discussed in Section 5 of Appendix F.

25 Botanical surveys conducted during the early blooming period in March 2020 determined that
 26 recurved larkspur, Hoover's Eriastrum, spiny-sepaled button-celery, Munz's tidy-tips, and
 27 California alkali grass do not occur in the Project area. The presence or absence of late-blooming
 28 special-status plant species (i.e., Earlimart orache, Lost Hills crownscale, brittlescale, lesser
 29 saltscale, subtle orache) in the Project area has not been determined.

30 **Special-Status Animal Species**

31 CNDDDB special-status animal species occurrences within five miles of the Project area are
 32 illustrated in Appendix F, Figure 4. Based on the assessment of habitats in the Project area, 18
 33 special-status animal species have a potential to occur. These species are Kern brook lamprey
 34 (*Entosphenus hubbsi*), San Joaquin roach (*Lavinia symmetricus*), western spadefoot (*Hypomesus*
 35 *transpacificus*), northern California legless lizard (*Anniella pulchra*), California glossy snake
 36 (*Arizona occidentalis*), San Joaquin coachwhip (*Masticopus flagellum ruddocki*), coast horned
 37 lizard (*Phrynosoma blainvillii*), burrowing owl (*Athene cunicularia*), northern harrier (*Circus*
 38 *cyaneus*), white-tailed kite (*Elanus leucurus*), golden eagle (*Aquila chrysaetos*), Swainson's
 39 hawk (*Buteo swainsoni*), pallid bat (*Antrozous pallidus*), Townsend's big-eared bat
 40 (*Corynorhinus townsendii*), western mastiff bat (*Eumops perotis californicus*), Buena Vista Lake
 41 shrew (*Sorex ornatus relictus*), American badger (*Taxidea taxus*), and San Joaquin kit fox
 42 (*Vulpes macrotis mutica*). These special-status animal species are further discussed in Section 5
 43 of Appendix F.

1 **Cultural Resources**

2 Cultural resources are defined as prehistoric and historic-era archaeological sites, architectural or
3 built environment resources (e.g., canals, bridges, and buildings), and places important to Native
4 Americans and other ethnic groups that are generally 50 years of age or older regardless of their
5 significance.

6 **Cultural Resources Investigations and Results**

7 Cultural resources investigations for the Project included a records search conducted at the
8 Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical
9 Resources Information System, a desktop literature review, a geoarchaeological sensitivity
10 assessment, and a pedestrian survey of the entire Area of Potential Effects (APE). Native
11 American consultation for the Project is discussed in the Tribal Resources section of this EIS/R.
12 In addition, Reclamation has an existing Programmatic Agreement (PA) in place with the SHPO
13 for treatment of the FKC and is developing an amendment to the PA to address the Project.

14 The Project APE includes both direct effects and indirect effects to differentiate between types of
15 effects to potential historic properties and/or historical resources. The area of direct effects
16 consists of the Project footprint in which all construction activities will occur, including staging
17 areas and access roads. The maximum vertical extent of such activities would extend no more
18 than 50 feet below the existing ground surface and would only occur at the Deer Creek and
19 White River sections of the Project APE. The area of indirect effects consists of an area in which
20 Project activities may sever a property from its setting or create visual, audible, or atmospheric
21 intrusions; shadow effects; vibrations; or change in access or use. The area of indirect effects
22 aligns with existing Assessor's Parcel Number boundaries and includes any parcel that is
23 adjacent to the area of direct effects containing built environment resources.

24 SSJVIC base maps were used to identify previously recorded cultural resources and studies
25 within a 0.25-mile radius around the Project APE. Resource inventories, including the California
26 Register of Historical Resources (CRHR) and California Historical Landmarks, were also
27 consulted along with historic maps, historic aerial imagery, and the Office of Historic
28 Preservation's Archaeological Determinations of Eligibility and Historic Properties directories.

29 The SSJVIC record search and desktop review did not identify any previously recorded
30 archaeological sites but did identify three previously recorded built environment resources within
31 the Project APE. Table 3-2 identifies the cultural resources identified as part of the records
32 search and their eligibility for inclusion in the National Register of Historic Places (NRHP) and
33 the CRHR. The records search also identified 27 previously completed archaeological studies
34 either within the Project APE or within a 0.25-mile radius of the APE.

1 **Table 3-2. Previously Recorded Cultural Resources Identified in 2018 Records Search**

Primary Number	Trinomial Number	Other Designation	Description	NRHP Eligibility Status
P-54-002208	CA-TUL-3077H	CWA20-172-1	Segment of the Poplar Ditch (earthen water conveyance ditch) (1875)	3CS (Appears eligible for the CRHR as an individual property through survey evaluation). This resource was evaluated for eligibility for the NRHP and determined not eligible as a result of this study.
P-54-004614/ P-15-013728	CA-TUL-2873H/ CA-KER-7704H	Friant-Kern Canal	Earthen and concrete-walled canal (1945–1951)	2S2 (Individual property determined eligible for NRHP by consensus through Section 106 process. Listed in CRHR)
P-54-004832	CA-TUL-3011H	Big Creek East & West Transmission Line	Two parallel transmission lines (1912–1913)	1D (Contributor to a district or multiple resource property listed in NRHP by the Keeper. Listed in the CRHR)

2 The geoarchaeological sensitivity assessment for the Project APE included a review of
 3 geological and soils maps, archaeological and historical databases, and subsurface testing to
 4 identify depositional landforms and their sensitivity for the potential presence of buried
 5 archaeological sites (Meyer 2020). The assessment determined that the Project APE generally
 6 exhibits a low sensitivity for the presence of buried archaeological sites or other cultural
 7 resources with only six percent of the Project APE identified as highly sensitive for buried
 8 resources (Meyer 2020). The areas of high sensitivity are primarily located near rivers and creeks
 9 such as Tule and White Rivers, and Deer Creek. The results of the geoarchaeological sensitivity
 10 assessment were documented in a report entitled *Geoarchaeological Assessment and Extended*
 11 *Phase I Study of the Friant-Kern Canal Middle Reach Capacity Correction Project for the San*
 12 *Joaquin River Restoration Program, Tulare and Kern Counties, California* (Meyer 2020).

13 Intensive pedestrian surveys of the Project APE were conducted by archaeologists and
 14 architectural historians who meet the Secretary of the Interior’s Professional Qualification
 15 Standards for Archaeology and Architectural History in 2018 and 2019 (Stantec 2020).
 16 Archaeologists conducted a surface pedestrian survey that covered all but 1.5 acres of the
 17 approximately 2,700-acre Project APE. Ground visibility varied from 80 to 100 percent. The
 18 archaeological pedestrian surface survey did not identify any prehistoric or historic-era
 19 archaeological resources in the Project APE (Stantec 2020). The architectural history survey
 20 documented 103 built environment resources. Built environment resources such as the canal,
 21 bridges, irrigation pumping stations, and residential and agricultural properties were recorded or
 22 updated using California Department of Parks and Recreation 523 forms and photography, which
 23 included both overview and detail views.

24 Of the 103 built resources within the Project APE, a total of three were previously determined
 25 eligible for listing in the NRHP and/or the CRHR (see Table 3-2) and as a result of this study,

1 seven additional resources were recommended to be eligible for listing in both the NRHP and
 2 CRHR. These historic resources include Lake Woollomes (or Delano Equalizing Reservoir),
 3 three pumping stations within the Delano-Earlimart Irrigation District, Columbine Vineyards,
 4 and two residences. Lake Woollomes and the three pumping stations in the Delano-Earlimart
 5 Irrigation District are recommended to be eligible as contributors to the FKC, but not eligible
 6 individually. Columbine Vineyards is recommended to be eligible for inclusion in the NRHR and
 7 CRHR under Criteria C and 3 (respectively) at the local and state-level as an intact example of a
 8 post-World War II agricultural workers camp and processing facility in the Central Valley of
 9 California. The Columbine Vineyards property has a period of significance ranging from 1957 to
 10 1965 under both Criteria C and 3. Two residential properties, 19315 Road 235 Strathmore, CA,
 11 and 23100 Avenue 208 Lindsay, CA, were inaccessible due to obstructions, as such they have
 12 been conservatively recommended as eligible under Criteria C and 3 for the purposes of this
 13 Project.

14 **Table 3-3.** Cultural Resources Evaluated and Recommended to Be Eligible as a Result of
 15 This Study

Survey Reference Number	Built Date(s)	Property Type or Name	NRHP/CRHR Eligibility
FKC-2	c. 1949-1959	Lake Woollomes (Delano Equalizing Reservoir)	NRHP/CRHR eligible (as a contributor to the FKC; not individually eligible)
FKC-7	1920s	Columbine Vineyards, 32500 Cecil Avenue, Delano, Kern County	Individually NRHP/CRHR eligible under Criteria A/1 and C/3
FKC-63	1955	19315 Road 235, Strathmore, Tulare County	Individually eligible under NRHP/CRHR Criteria C/3 for purposes of this Project
FKC-85	1909	23100 Avenue 208, Lindsay, Tulare County	Individually eligible under NRHP/CRHR Criteria C/3 for purposes of this Project
FKC-87	c. 1952-1956	Avenue 40 Pumping Station, Avenue 56 Pumping Station, and County Line Road Pumping Station, Delano-Earlimart Irrigation District	NRHP/CRHR eligible (as contributors to the FKC; not individually eligible)

16

17 The eligible resources located within the Project APE that have the potential to be impacted
 18 directly under both the CER and CE Alternatives are the FKC, Southern California Edison Big
 19 Creek East & West Transmission Line, and Poplar Ditch. Both alternatives involve modifications
 20 to a 33.3-mile segment of the FKC. The Project will result in modification of 22 percent of the
 21 overall canal, resulting in degradation of the character-defining features and a loss of integrity
 22 resulting in an adverse effect to the FKC. Due to both build alternatives having an adverse effect
 23 on the canal, the undertaking will result in an overall finding of adverse effect to historic
 24 properties.

1 These findings are analyzed further in the *Friant-Kern Canal Middle Reach Capacity Correction*
2 *Project, Section 106 Technical Report* (Stantec 2020).

3 **Geology and Soils**

4 The FKC is located in the Great Valley geomorphic province and is bordered on the east by the
5 Sierra Nevada geomorphic province and on the west by the Coast Ranges geomorphic province
6 (Reclamation and Friant Water Authority 2011). The Great Valley, an alluvial floodplain of two
7 major rivers—the San Joaquin and Sacramento Rivers—and their tributaries, is approximately 50
8 miles wide and 400 miles long. The Great Valley province is divided into two parts, the
9 Sacramento Valley, drained by the Sacramento River in the north, and the San Joaquin Valley,
10 drained by the SJR in the south. The Project area is located in the San Joaquin Valley. Snowmelt
11 from the Sierra Nevada feeds the SJR and its major tributaries (Reclamation and DWR 2011).

12 The geology of the Great Valley generally consists of marine and continental deposits underlain
13 by metamorphic and igneous rocks. The geology of the San Joaquin Valley consists mainly of
14 Jurassic to recent marine, alluvial, and lake deposits that are several thousand feet thick
15 (Reclamation and DWR 2011).

16 Figure 3-1 illustrates the geology of the Project area and surrounding areas. Although 10
17 geologic formations are shown on this map, the Project area itself crosses only two geologic
18 formations: older alluvium, lake, playa, and terrace deposits; and alluvium, lake, playa, and
19 terrace deposits that are unconsolidated and semi-unconsolidated (Smith 1964, Matthews and
20 Burnett 1965).

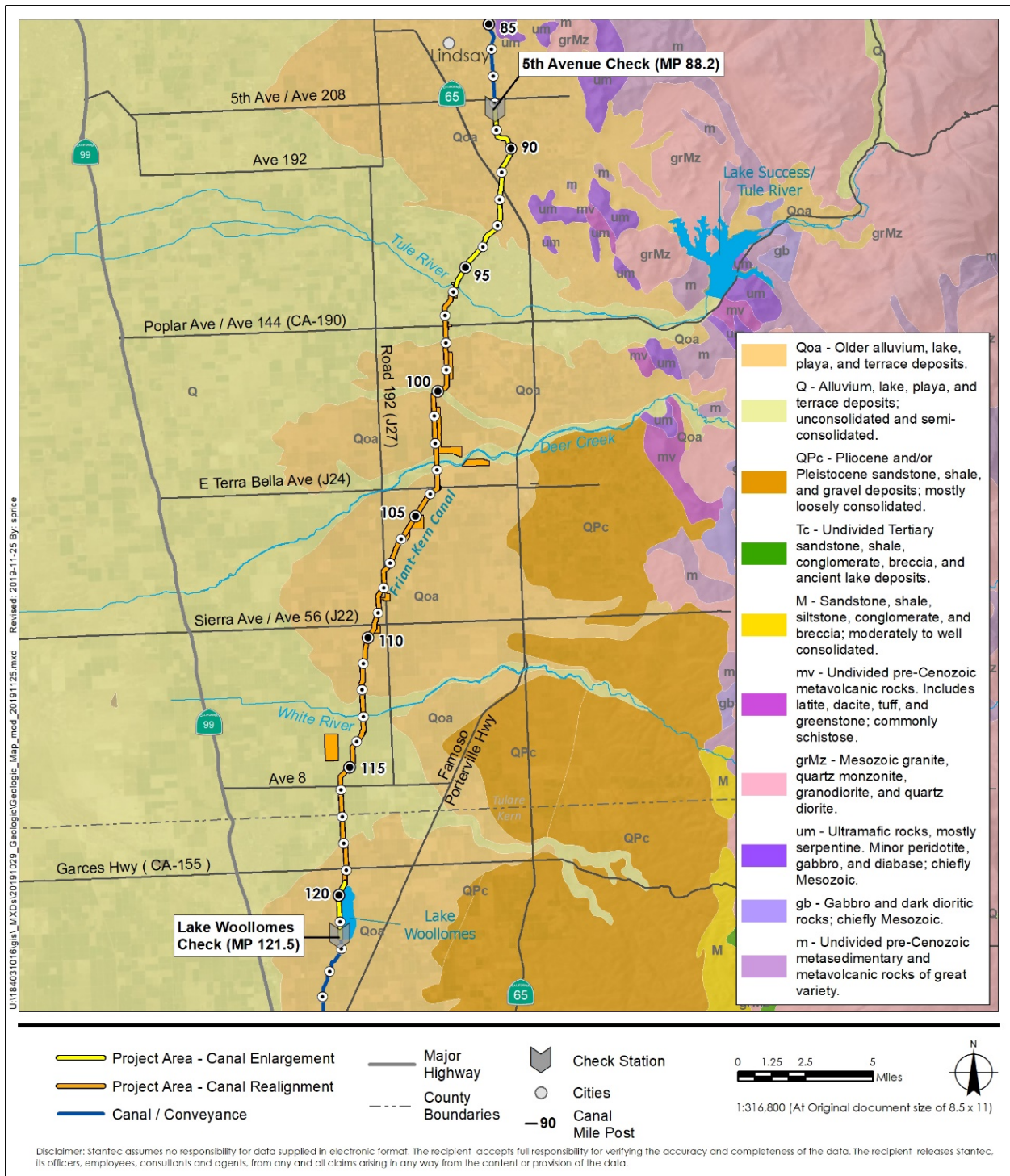
21 The Central Valley floor is divided into several geomorphic land types: dissected uplands; low
22 alluvial fans and plains; river channels, floodplains, and deltas; and lake bottoms. The Project
23 area is primarily composed of alluvial fans and plains and river floodplains and channels.
24 Alluvial fans and plains are unconsolidated continental deposits that extend from the edges of the
25 valley toward the valley floor. The alluvial plains are relatively flat with little topographic relief
26 and have been developed into extensive agricultural lands (DWR 2012). Deer Creek, the White
27 River, and the Tule River cross the Project area.

28 **Paleontological Resources**

29 Paleontological resources include fossil remains, fossil localities, and formations that have
30 produced fossil material in other nearby areas. These resources are limited, nonrenewable,
31 sensitive scientific and educational resources protected by federal environmental laws and
32 regulations. Paleontological resources include fossils preserved either as impressions of soft
33 (fleshy) or hard (skeletal) parts; mineralized remains of skeletons, tracks, or burrows; other trace
34 fossils; coprolites (fossilized excrement); seeds or pollen; and other microfossils from terrestrial,
35 aquatic, or aerial organisms (County of Fresno 2009).

36 A paleontological study was not conducted for the Project area because it is not a known fossil-
37 bearing area based on a thorough search of the geological literature. Fossils found in and near the
38 San Joaquin Valley are related to the ice age Lake Corcoran, which once inundated the valley.
39 This Pleistocene lake provided aquatic and terrestrial habitat for ice age species, many of which
40 are now extinct. In general, most fossil sites are found towards the western San Joaquin Valley,

- 1 where conditions for fossil preservation are better than fossil sites in the eastern side where the
- 2 Project is located (County of Fresno 2009; Harden 1998). Therefore, it is unlikely that fossil sites
- 3 occur within the Project area.



4

5 **Figure 3-1. Geologic Map of the Project Area**

1 **Seismic Activity**

2 Tulare and Kern Counties are characterized as a low-severity zone for ground shaking from a
 3 seismic event (Reclamation and FWA 2019). The Project area is located in a moderately active
 4 seismic area (CGS 2010), despite Tulare and Kern Counties being characterized as a low-
 5 severity zone for ground shaking. The southern end of the Project area is closer to known active
 6 faults than the northern end. Active faults in the vicinity of the Project are listed in Table 3-4.

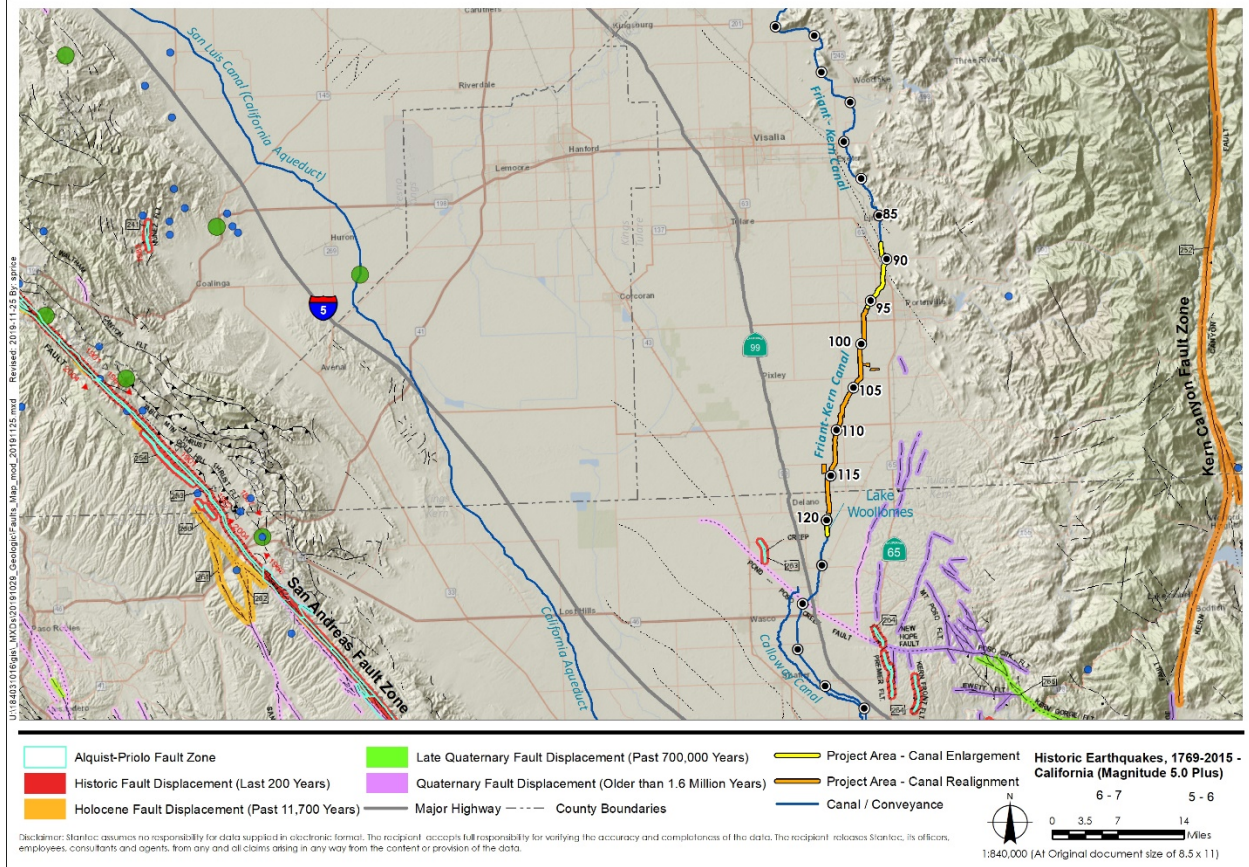
7 **Table 3-4. Active Faults in the Vicinity of the Project Area**

Fault	Distance from the Southern End of the Project Area (miles)	Maximum Moment Magnitude
Great Valley 14 (Kettleman Hills)	43.9	7.2
White Wolf	48.3	7.2
South San Andreas	51.7	8.2
Pleito	55.6	7.1
Great Valley 13 (Coalinga)	57.5	7.1

8 Source: USGS 2014

9 The Alquist-Priolo Earthquake Fault Zoning Act was signed into California law in 1972 to
 10 mitigate the hazard of surface faulting to structures for human occupancy. Figure 3-2 displays
 11 the fault activity in the Project area, including the mapped Alquist-Priolo fault zones. The Project
 12 area does not intersect any of these fault zones (CGS 2019).

13 Seismic ground-shaking can cause soils and unconsolidated sediments to compact and settle. If
 14 soils or sediments are saturated, compaction can force pore water upward to the ground surface.
 15 This soil deformation, called liquefaction, may cause the ground to sink or pull apart or
 16 temporarily behave like a liquid instead of solid ground, causing minor to major damage to
 17 infrastructure. The potential for earthquake ground-shaking hazards is low in most of the San
 18 Joaquin Valley; however, some liquefaction risk is assumed in areas where unconsolidated
 19 sediments and a high-water table coincide (California Seismic Safety Commission 2003).



1

2 **Figure 3-2. Regional Fault and Seismicity Map**

3 **Soils**

4 Soils in the San Joaquin Valley are generally described as alluvium. The Kern County and Tulare
 5 County soil surveys show that the Project area intersects 26 soil classifications. The dominant
 6 soil classifications in the Project area are Exeter loam (29 percent of the Project area), a
 7 moderately well-drained soil with a parent material of alluvium derived from granitic rock
 8 sources, and Hanford sandy loam (21 percent of the Project area), a well-drained soil with a
 9 parent material of alluvium derived from granitic rock sources. Approximately 21 percent of the
 10 Project area is characterized as the water in the FKC (Table 3-5).

11 Mechanical erosion is the geological process in which earthen materials are worn away and
 12 transported by natural forces such as wind or water. Factors that increase the likelihood of
 13 erosion and runoff include land use, soil type and texture, landscape, and weather. The Project
 14 area is relatively flat with little topographic relief and primarily consists of the existing FKC;
 15 barren, ruderal, or agricultural land; and roadways. The Project area consists primarily of loamy
 16 soils. These soils include a roughly even mixture of clay, silt, and sand. Loamy and sandy soils
 17 drain well and are susceptible to erosion.

1 Table 3-5. Soil Unit Classifications in the Project Area

Soil Survey/ Soil Map Units	Acres	Percent of Project Area	Soil Unit Description
Tulare County (West)			
101	1.7	0.1	Akers-Akers, saline-Sodic, complex, zero to two percent slopes; well-drained alluvium derived from granitic rock source
105	74.5	2.8	Calgro-Calgro, saline-Sodic, complex, zero to two percent slopes; moderately well-drained alluvium derived from granite
106	9.9	0.4	Centerville clay, zero to two percent slopes; well-drained alluvium derived from granitic rock sources
108	100.4	3.8	Colpien loam, zero to two percent slopes; moderately well drained alluvium derived from granitic rock sources
112	4	0.1	Dumps
114	779.8	29.3	Exeter loam, zero to two percent slopes; moderately well drained alluvium derived from granitic rock sources
116	103.1	3.9	Flamen loam, zero to two percent slopes; moderately well drained alluvium derived from granitic rock sources
124	459.2	17.2	Hanford sandy loam, zero to two percent slopes; well-drained alluvium derived from granitic rock sources
130	207.0	7.8	Nord fine sandy loam, zero to two percent slopes; well-drained alluvium
131	1.7	0.1	Pits: alluvium derived from granite
134	14.9	0.6	Riverwash, zero to two percent slopes; alluvium derived from granite
135	12.4	0.5	San Joaquin loam, zero to two percent slopes; moderately well drained alluvium
137	40.3	1.5	Tagus loam, zero to two percent slopes; well-drained alluvium derived from granitic rock sources
138	6.5	0.2	Tujunga loamy sand, zero to two percent slopes; somewhat excessively drained alluvium derived from granite
143	5.3	0.2	Yettem sandy loam, zero to two percent slopes; well-drained alluvium derived from granite
145	555.1	20.8	Water
Tulare County (central)			
124	2.1	0.1	Exeter loam, zero to two percent slopes; well-drained alluvium derived from granitoid
154	52.0	2.0	San Joaquin loam, zero to two percent slopes; moderately well drained alluvium derived from acid igneous rock
155	8.8	0.3	San Joaquin loam, two to nine percent slopes; moderately well drained alluvium derived from acid igneous rock
172	6.2	0.2	Wyman loam, zero to two percent slopes; well-drained alluvium derived from igneous rock

Soil Survey/ Soil Map Units	Acres	Percent of Project Area	Soil Unit Description
178	15.2	0.6	Water
Kern County (NW)			
154	97.3	3.7	Exeter sandy loam, zero to two percent slopes; well-drained alluvium derived from granite
192	7.7	0.3	McFarland loam, zero to two percent slopes; well-drained alluvium derived from granite
243	44.2	1.7	Wasco sandy loam, zero to two percent slopes; well-drained alluvium derived from granite
257	44.7	1.7	Water
130tw	8.6	0.3	Nord fine sandy loam, zero to two percent slopes; well-drained alluvium

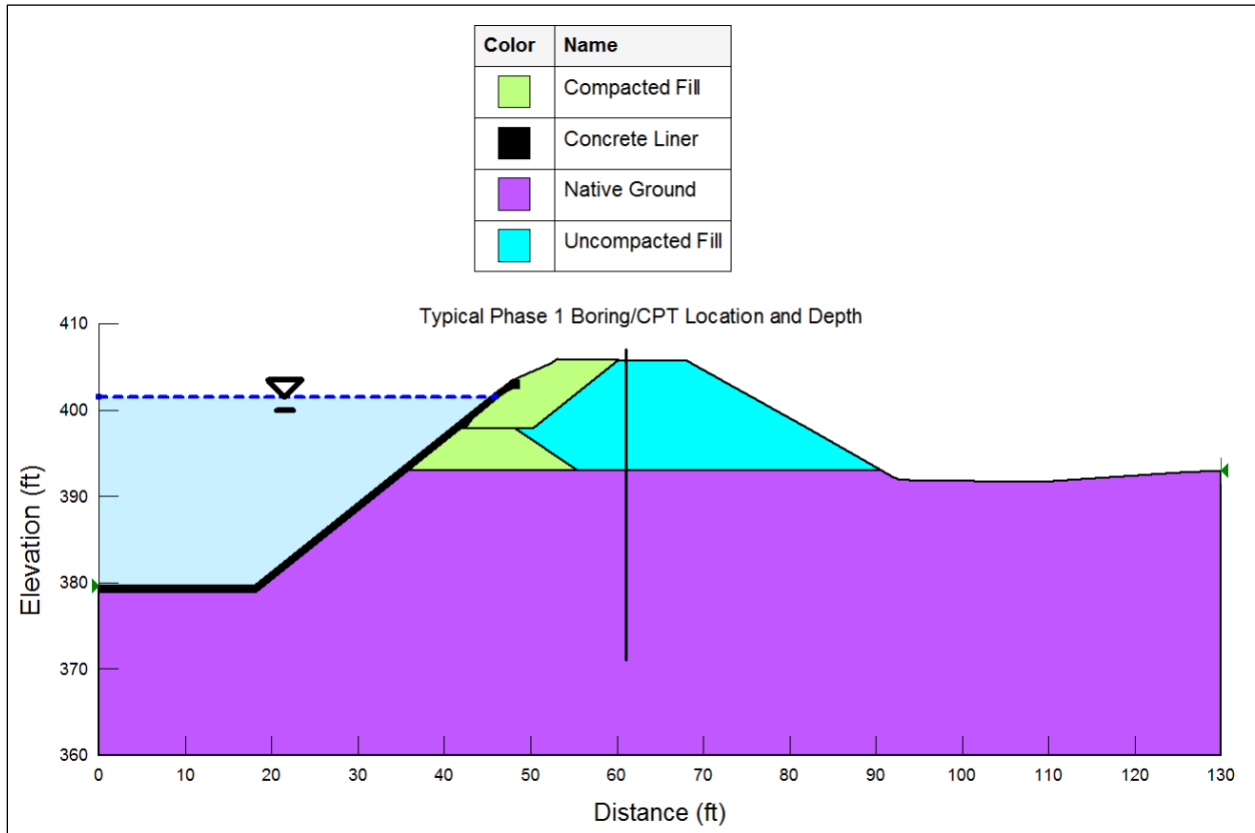
1 Source: Natural Resources Conservation Service 2019

2 In 2018, phase 1 of a multi-phase geotechnical investigation using drilling and cone penetration
3 test (CPT) rigs was conducted to determine the subsurface characteristics of the Project area with
4 respect to type and extent of fill and alluvial materials and location of shallow groundwater
5 zones within the FKC embankments. The phase 1 investigation consisted of nine hollow-stem
6 auger borings and CPTs located in the middle of the existing O&M Road. Based on the geometry
7 of the embankment as described in the original as-built construction drawings from 1945 and the
8 as-built construction drawings of the embankment raise in the 1970s, a typical embankment
9 geometry cross-section comprising three units (Figure 3-3) was developed. As shown in Figure
10 3-3, the phase 1 investigation intersected only the uncompacted fill and the alluvium (native
11 ground). A description of these two units is provided in a 2018 Stantec report and is summarized
12 below. Bore holes in the phase 1 investigation ranged from approximately 20 to 50 feet deep.
13 During the phase 3 geotechnical investigation, relatively shallow groundwater was encountered
14 in several of the piezometers installed near Deer Creek and Tule River at the time when canal
15 water was being delivered into Deer Creek. All but one of the piezometers adjacent to Tule River
16 showed dry conditions in January 2020, approximately one month after water deliveries ceased
17 at Deer Creek. Water deliveries at Tule River during the January 2020 readings were not
18 observed. Accordingly, shallow groundwater adjacent to Deer Creek and Tule River appears to
19 be present only during or shortly after water deliveries.

20 Below are descriptions, summarized from Stantec 2018, of the uncompacted fill and alluvium
21 encountered during the phase 1 geotechnical investigation.

22 *The uncompacted fill encountered in the explorations consisted of sandy lean clay*
23 *(Unified Soil Classification System Symbol: CL), fat clay (CH), clayey sand (SC), and*
24 *well graded sand (SW). The uncompacted fill was typically more clayey in the northern*
25 *section of the alignment, and sandier in the southern section of the alignment. The*
26 *uncompacted fill thickness varied at the boring locations from approximately 9 feet to 16*
27 *feet.*

1 The alluvium encountered in the explorations consisted of sandy lean clay and lean clay
 2 with sand (CL), fat clay (CH), clayey sand (SC), well graded sand with gravel (SW), well
 3 graded sand with silt (SW-SM), and silty sand (SM). The alluvium was typically more
 4 clayey in the northern section of the alignment, and sandier in the southern section of the
 5 alignment. The alluvium extended to a depth of at least 46.5 feet, the maximum depth of
 6 the borings.



7
 8 **Figure 3-3. Canal Embankment Section Showing a Typical Phase 1 Boring and CPT**

9 **Greenhouse Gases/Climate Change**

10 Greenhouse gases (GHGs) and climate change are cumulative global issues. The California Air
 11 Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) regulate GHG
 12 emissions in California and the U.S., respectively. While the CARB has the primary regulatory
 13 responsibility for GHG emissions in California, local agencies such as SJVAPCD can also adopt
 14 policies for GHG emission reduction.

15 Many chemical compounds in the Earth’s atmosphere act as GHGs, as they absorb and emit
 16 radiation within the thermal infrared range. Many gases exhibit “greenhouse” properties. Some
 17 of them occur in nature (water vapor, carbon dioxide [CO₂], methane [CH₄], and nitrous oxide
 18 [N₂O]), while others are exclusively human made (like gases used for aerosols) (EPA 2019). A
 19 CO₂ equivalent (CO₂e) is a metric measure used to compare emissions from these various GHG

1 sources, on the basis of their global warming potential, by converting amounts of the other gases
2 to the equivalent amount of CO₂ with the same global warming potential.

3 **Historical Climate**

4 The Central Valley is characterized by hot, dry summers and cool, damp winters. Over the 20th
5 century, the mean annual temperature has increased by approximately 2°F, although not steadily.
6 The increases primarily occurred between 1915 and 1935 and again in the mid-1970s through the
7 present. Central Valley precipitation falls primarily from mid-autumn to mid-spring. The
8 variability of annual precipitation has increased in the latter part of the 20th century; these
9 extremes in wet and dry years have been especially frequent since the 1980s (Tulare County
10 2010a).

11 Global climate change is expected to affect California’s water supply through a diminishing
12 Sierra snowpack. Although much uncertainty remains with respect to the effects of global
13 climate change on California’s water supplies, it is expected that increased amounts of winter
14 runoff could be accompanied by increases in flood event severity and warrant additional
15 dedication of wet season storage space for flood control instead of using the water for supply
16 conservation, as is the standard practice. This change in water management could, in turn, lead to
17 more frequent water shortages during high water demand periods (Tulare County 2010b). Many
18 regional studies have shown that only small changes in inflows into reservoirs could result in
19 large changes in the reliability of water yields from those reservoirs (Tulare County 2010b).

20 **Hazards and Hazardous Materials/Wildfire**

21 Regulatory agency databases of hazardous materials sites compiled pursuant to Government
22 Code Section 65962.5 were reviewed to identify documented releases of hazardous materials in
23 soil and groundwater within 0.5 mile of the Project components. Databases included the
24 California State Water Resources Control Board’s GeoTracker database (2019) and the
25 California Department of Toxic Substances Control’s EnviroStor database (2019). A 0.25-mile
26 search radius around the Project area was used to determine the potential for migration of
27 shallow groundwater contaminant plumes from any LUST cases to adversely affect groundwater
28 in the Project area.

29 Other sources reviewed for this section include a review of the mapped fire hazard severity zones
30 for Tulare and Kern Counties (CAL FIRE 2019) and state and federal health agencies for
31 information concerning valley fever.

32 **General Overview**

33 The Project area crosses intensively farmed agricultural lands and agricultural preserves
34 (i.e., agricultural lands removed from production either permanently or temporarily by contract
35 or easement) and associated roadway, utility, and drainage infrastructure. Current and past land-
36 use activities are potential indicators of hazardous material storage and use.

37 There are five schools located within 0.25 mile of the FKC: Strathmore Elementary School and
38 Strathmore Middle School in Strathmore, and William R. Buckley Elementary School, Burton
39 Middle School, and Summit Charter Academy in Porterville. All five schools are located in the

1 northern portion of the Project area north of Tule River. There are no schools located within a
2 0.25-mile distance of the Project area, south of Tule River.

3 A network of roads passes through the Project area. In the event of an emergency, both Tulare
4 County and Kern County rely on their respective Emergency Operations Plans to provide
5 organizational structure and guidance through emergencies. Neither county specifies emergency
6 evacuation routes in rural areas. Emergency evacuation routes are determined on a case-by-case
7 basis in accordance with the location and type of emergency.

8 **Asbestos and Lead**

9 A review of the *General Location Guide for Ultramafic Rocks in California: Areas Likely to*
10 *Contain Naturally Occurring Asbestos* (California Department of Conservation, Division of
11 Mines and Geology 2000) shows areas likely to contain natural occurrences of asbestos within an
12 approximately two-mile radius of the Project area. Generally, these areas are east of State Route
13 (SR) 65 and north of Porterville; however, there are no known sources of naturally occurring
14 asbestos in the Project area.

15 Bridges along the Project alignment may have components such as paints, gaskets, caulking,
16 insulation, and tarred surfaces that may contain asbestos and lead. The likelihood of asbestos
17 being present increases with the age of the bridge since it was only in the 1980s that use of
18 asbestos-containing building materials began to diminish. Similarly, paint containing lead was
19 commonly used to coat bridge components such as railings and other metal and wood surfaces
20 prior to its being banned in California in 1978. The potential exists for some bridges in the
21 Project area to contain lead paint. Aerially deposited lead (ADL) from motor-vehicle exhaust
22 may be present in low concentrations in the soils adjacent to Project area roads based on the age
23 of the roadway and the date of the ban of leaded motor vehicle fuel (i.e., 1996).

24 **Hazardous Materials**

25 LUSTs and surface runoff from agricultural fields treated with pesticides and herbicides are
26 some of the more common sources of hazardous materials found on agricultural lands. There are
27 nine known hazardous waste cleanup sites on the Cortese list compiled pursuant to Government
28 Code section 65962.5 within approximately 0.5 mile of the FKC. Six of the sites are categorized
29 as LUST cleanup sites, two are classified as cleanup program (i.e., non-federally owned) sites,
30 and one is classified as a military cleanup site. Of the nine sites, eight are designated
31 inactive/case closed, and one—Kurz Trucking—is currently an active LUST site located
32 approximately 1,800 feet west of the FKC on Avenue 196 in Strathmore (California Department
33 of Toxic Substances Control 2019). The contaminant of concern at this site is gasoline that could
34 pollute the local drinking water aquifer. Cases that have been closed by the pertinent regulatory
35 agencies are considered to pose a low threat to human health and groundwater quality.

36 Chemical pesticide and herbicide use by the agricultural industry in Tulare and Kern Counties is
37 regulated by the county's agricultural commissioner. The potential for excessive exposure of
38 humans and the environment to these hazardous materials sources is reduced through regulation
39 and enforcement.

1 **Valley Fever**

2 Valley fever—sometimes called “San Joaquin Valley fever” or “desert rheumatism”—is an
3 infection caused by a soil-dwelling fungus (*Coccidioides*) that, when inhaled, can affect the
4 lungs, causing respiratory symptoms including cough, fever, chest pain, and tiredness. Kern
5 County has one of the highest reported rates of valley fever in the state (more than 100 reported
6 cases per 100,000 population), with Tulare County reporting slightly fewer cases (40 to 90
7 reported cases per 100,000 population) (CDPH 2019).

8 **Wildfire**

9 The Project area is located within the San Joaquin Valley, which has a low potential for wildfire,
10 and is not located in a state responsibility area fire hazard severity zone (CAL FIRE 2019). The
11 FKC traverses a portion of Tulare County that is mostly classified as having a low threat of
12 wildfire, although some small isolated lands near the Project area (within one mile) in Tulare
13 County are classified as having a high and very high threat of wildfire (Tulare County 2010).
14 The portion of the Project area that extends into Kern County is mapped as having a very low to
15 low wildfire hazard potential (CAL FIRE 2018). The highest potential for wildfire is in the
16 foothills and mountainous areas in the eastern parts of the two counties, which have steep terrain
17 and naturally volatile or hot-burning vegetation including brush and grasslands (Kern County
18 2004, Tulare County 2010). The topography of the Project area is nearly level.

19 **Hydrology and Water Quality**

20 **Friant Dam and Millerton Lake**

21 Friant Dam is a concrete gravity dam that impounds Millerton Lake on the SJR located about 16
22 miles northeast of Fresno near the community of Friant. Millerton Lake has a capacity of 524
23 thousand AF and is typically filled during late spring and early summer from snowmelt. Friant
24 Dam releases water deliveries to the FKC and Madera Canal through outlet works. There is also
25 a river outlet works to the SJR located to the left of the spillway in the lower portion of the dam.
26 Friant Dam and Millerton Lake are authorized for agriculture and municipal and industrial water
27 supply, flood control, and the release of Restoration Flows pursuant to the Settlement Act. Water
28 in Millerton Lake is generally soft with low mineral and nutrient concentrations (Reclamation
29 and DWR 2014).

30 **Friant-Kern Canal**

31 The FKC, operated and maintained by FWA, is a 152-mile gravity canal that conveys water from
32 Friant Dam south to the Kern River⁵. The FKC has a maximum design capacity of 5,300 cfs,
33 gradually decreasing to 2,500 cfs to accommodate conveyance for downstream water demand.
34 However, the maximum design capacity has not been actualized. Original design assumptions
35 regarding the roughness or Manning’s “n” value were found to be inaccurate shortly after
36 completion of the canal, resulting in reduced capacity. The capacity has been further reduced due

⁵ Note the FKC terminates at the Kern River, but the river is not part of the Project area. Therefore, it is not included in the analysis.

1 to regional land subsidence, increased canal surface roughness with age, vegetation in canal
2 sections, and localized seepage through canal embankments.

3 Along with land adjacent to the canal, sections of the FKC have subsided. The section from MP
4 99 to MP 116, between Avenue 128 and Avenue 8 in Tulare County, has experienced the most
5 subsidence, with a significant localized depression between MP 103 and MP 107 (Deer Creek to
6 Avenue 74), where subsidence of more than 10 feet has been measured since the FKC was
7 completed.

8 Subsidence-induced capacity loss has resulted in downstream water delivery loss to six Friant
9 Division long-term contractors: Arvin-Edison Water Storage District, Delano-Earlimart
10 Irrigation District, Kern-Tulare Water District, Sausalito Irrigation District, Shafter-Wasco
11 Irrigation District, and Southern San Joaquin Municipal Utility District (Figure 3-4).

12 **Surface Water Resources and Quality**

13 The Project area is in the Tulare Lake Basin, specifically in the Tulare–Buena Vista Lakes
14 watershed (Hydrologic Unit Code 18030012) and under the Tulare Lake Basin Plan. This
15 essentially closed basin is situated in the topographic horseshoe formed by the Diablo and
16 Temblor Ranges to the west, the San Emigdio and Tehachapi Mountains to the south, and the
17 Sierra Nevada to the east and southeast (Central Valley Water Board 2018). Surface water from
18 the Tulare Lake Basin drains north into the SJR only during years of extreme rainfall.

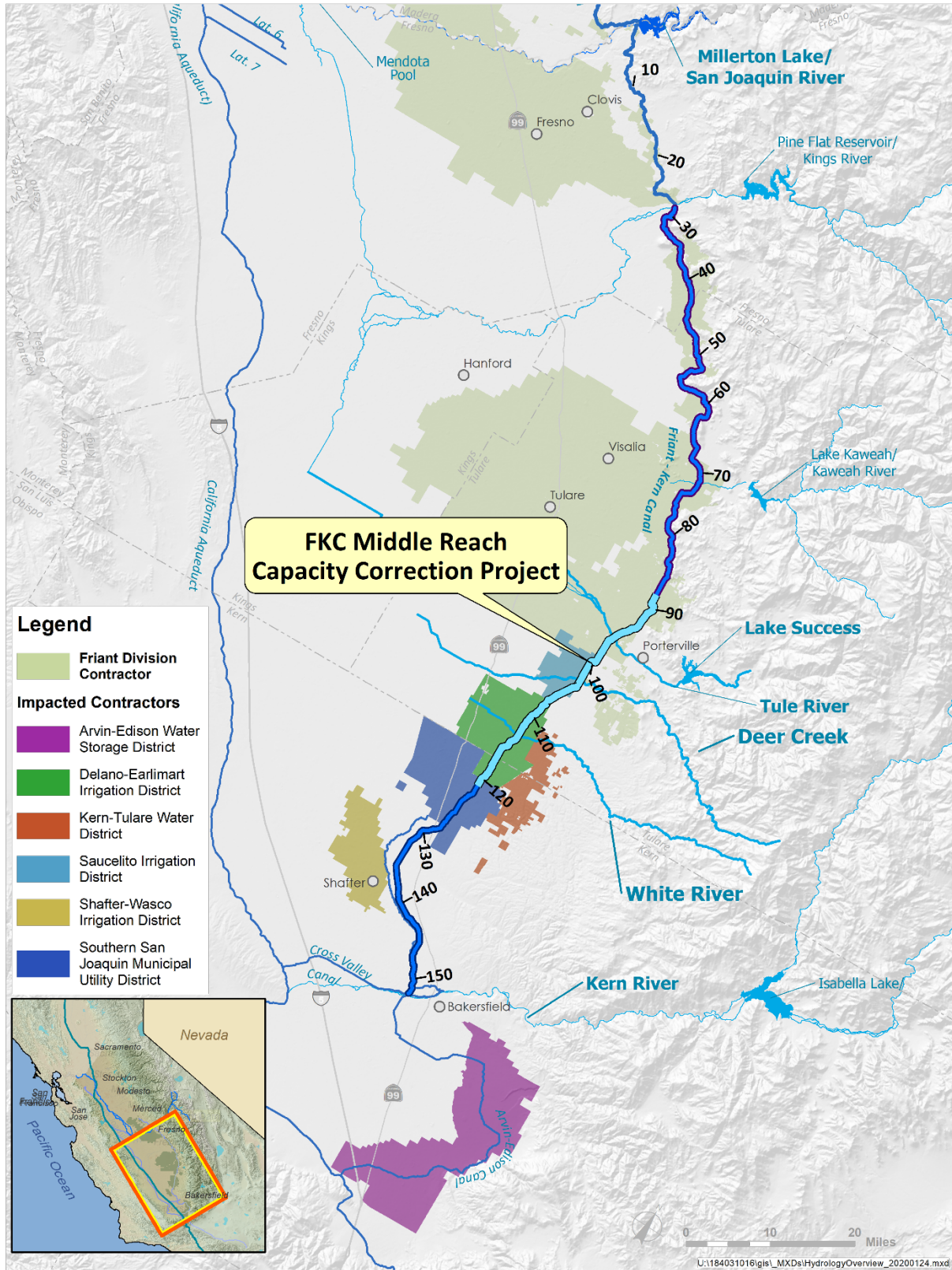
19 Drainages that cross the Project area flow from east to west and include, from north to south,
20 Tule River, Deer Creek, and White River (Figure 3-4). The Tulare–Buena Vista Lakes watershed
21 receives imported water from the upper SJR watershed via the FKC.

22 ***Tule River***

23 The Tule River is the largest natural drainage feature in the Project area. The Tule River
24 originates in the Sierra Nevada and flows into Lake Success and then, through controlled
25 releases at Schafer Dam (formerly Success Dam), flows through Porterville and into the Lower
26 Tule River Irrigation District, ultimately discharging onto the historical Tulare Lake lakebed
27 during periods of above-normal precipitation.

28 The Tule River downstream from Schafer Dam is the area of focus. Streamflow is measured via
29 gages located below Schafer Dam at Kettle Bridge downstream from Porterville and at Turnbull
30 Weir. Streamflow below Schafer Dam has ranged from 34,325 AF per year to 439,125 AF per
31 year with an annual average from water year⁶ 1990 through water year 2009 of 132,249 AF
32 (Harder 2017). There are a number of irrigation diversions (e.g., Porter Slough headgate,
33 Vandalia Ditch) on the Tule River that reduce flow in the channel upstream of the point where
34 the FKC crosses underneath the Tule River.

⁶ A water year is a 12-month period from October 1 to September 30 of the following year.



1
 2 **Figure 3-4. Friant-Division Contractors Affected by Subsidence and Hydrologic**
 3 **Features in the Project Area**

1 The Tule River flows over the FKC at MP 95.7. The FKC is diverted under the Tule River
2 through a 400-foot-long siphon with a capacity of 4,000 cfs. Water is diverted from the FKC to
3 the Tule River via a wasteway. Annual wasteway flow diversions range from 0 to 29,500 AF,
4 with an average of 22,270 AF and a median of 4,236 AF from the calendar years 2003 to 2019
5 (Friant Water Authority pers. comm. 2019). Below Lake Success, the Tule River supports
6 beneficial uses for agricultural supply, industrial service supply, industrial process supply, water
7 contact recreation, non-contact water recreation, warm freshwater habitat, wildlife habitat, and
8 ground water recharge.

9 The Lower Tule River (Hydrologic Unit Code 18030012) is listed as impaired on EPA's
10 2014/2016 303(d) of the CWA list for toxicity. A study submitted to the Regional Water Board
11 attributed the source of the toxicity occurrence to roadside herbicide application programs in
12 Tulare County (Tule River IRWM Group 2018). A total maximum daily load (TMDL) for
13 toxicity is scheduled for completion in 2027⁷.

14 **Deer Creek**

15 Deer Creek is a natural drainage that originates in the Sierra Nevada and flows in a westerly
16 direction north of Terra Bella and into Pixley. Discharges from Deer Creek rarely reach the
17 historical Tulare Lake lakebed. Streamflow has been measured at two USGS gaging stations near
18 Fountain Springs (USGS 11200800) and Terra Bella (USGS 11201200).

19 The Terra Bella gage was formerly most representative of conditions in the Project area, but the
20 gage is no longer in service. Average annual flow at the Fountain Springs gage upstream of the
21 Project area between water years 1990 and 2009 was approximately 19,728 AF per year, with a
22 low of 4,080 AF in water year 1991 and a high of 88,360 AF in water year 1997. However, much
23 of this flow is infiltrated or diverted at the Terra Bella diversion. Deer Creek flows over the FKC
24 at MP 102.7. The FKC is directed through a 172-foot-long siphon with a capacity of 4,000 cfs.
25 Annual wasteway diversions from the FKC to Deer Creek range from 0 to 81,500 AF, with an
26 average of 31,400 AF and a median of 15,700 AF from the calendar years 2003 to 2019 (Friant
27 Water Authority pers. comm. 2019).

28 Deer Creek supports beneficial uses for agricultural supply, industrial service supply, industrial
29 process supply, water contact recreation, non-contact water recreation, warm freshwater habitat,
30 wildlife habitat, rare, threatened or endangered species, and ground water recharge. Deer Creek
31 is listed as impaired on the 2014/2016 303(d) list for pH, toxicity, and chlorpyrifos, which are
32 from an unknown source. All pollutants negatively affect the warm freshwater habitat beneficial
33 use. A TMDL for pH and toxicity is scheduled for completion in 2021 and for chlorpyrifos in
34 2027.

35 **White River**

36 The White River drains out of the Sierra Nevada east of the community of Richgrove.
37 Streamflow in the White River was measured at the USGS gaging station near Ducor from 1971

⁷ The completion and agency approval of a TMDL is one step in the restoration process for an impaired waterway. The TMDL calculates numeric targets for attainment of water quality standards, and reductions are achieved via implementation of management plans and actions.

1 to 2005 (USGS 1199500). Average annual flow between water year 1990 and 2009 was
2 approximately 6,900 AF per year with a low of 739 AF in water year 1991 and a high of 36,764
3 AF in 1997. The White River channel extends as far west as SR 99 but does not reach the
4 historical Tulare Lake lakebed (Harder 2017). The White River flows over the FKC at MP 112.9.
5 The FKC is diverted through a 130-foot-long siphon with a capacity of 3,500 cfs. Annual
6 wasteway diversions from the FKC to the White River range from 0 to 5,600 AF, with an
7 average of 1,900 AF and a median of 24 AF from the calendar years 2003 to 2019 (Friant Water
8 Authority pers. comm. 2019).

9 Similar to Deer Creek, the White River supports beneficial uses for agricultural supply, industrial
10 service supply, industrial process supply, water contact recreation, non-contact water recreation,
11 warm freshwater habitat, wildlife habitat, rare, threatened or endangered species, and ground
12 water recharge.

13 **Groundwater Resources and Quality**

14 The Project area overlies the Tule and Kern Groundwater Subbasins, part of the larger San
15 Joaquin Valley Groundwater Basin. In the Tule Subbasin, groundwater flow is generally
16 westward (DWR 2004). Groundwater elevation contours diverge from the path of the Tule and
17 White Rivers in the north and south portions of the subbasin (DWR 2004). The Kern Subbasin,
18 directly south of the Tule Subbasin, has approximately 40 million AF of groundwater storage
19 with another 10 million AF of storage capacity (Kern Groundwater Authority 2020).

20 As defined by DWR, both the Tule and Kern Subbasins are critically overdrafted, meaning that a
21 continuation of present water management practices would probably result in significant adverse
22 overdraft-related environmental, social, or economic impacts (DWR 2019). Seventeen GSAs
23 have been established in the Tule and Kern Subbasins to manage for sustainable groundwater
24 through GSPs. They are Alpaugh, Delano-Earlimart Irrigation District, Lower Tule River
25 Irrigation District, Pixley Irrigation District, Tri-County Water Authority, Tulare County, Kern
26 Groundwater Authority, Buena Vista Water Storage District, Henry Miller Water District,
27 Cawelo Water District, City of McFarland, Pioneer, Semitropic Water Storage District, West
28 Kern Water District, Greenfield County Water District, Kern River, and Olcese Water District.

29 The GSAs are responsible for avoiding undesirable results in the subbasins such as water quality
30 degradation and subsidence. Subsidence is an historic and ongoing issue in the subbasins. During
31 the 2012 to 2016 drought, data from an interferometric synthetic aperture radar shows regional
32 land subsidence from May 2015 to September 2016 lowered the land surface elevation by as
33 much as 25 inches (National Aeronautics and Space Administration 2016). More recent data for
34 the Project area is unavailable for inclusion in this document.

35 Groundwater from the Tule Subbasin supports beneficial uses such as municipal and domestic
36 water supply, agricultural supply, industrial service supply, industrial process supply, and
37 wildlife habitat. Because of the closed nature of the Tulare Lake Basin, there is little subsurface
38 outflow (Central Valley Water Board 2018). Groundwater from the Kern Subbasin supports the
39 same beneficial uses as the Tule Subbasin, with the addition of water contact recreation and non-
40 contact water recreation.

1 Land Use and Planning and Agricultural Resources

2 The Project is located in Tulare and Kern Counties and passes to the west of Strathmore and City
3 of Porterville. The majority of the 33-mile Project alignment is within unincorporated portions of
4 the two counties.

5 Zoning

6 Land use zoning designations in the Project area were identified through the use of Geographic
7 Information System (GIS) data provided by each county (Kern County 2019a, Tulare County
8 2019) and by reviewing their respective zoning ordinances (Kern County 2017, Tulare County
9 Resource Management Agency 2019). In addition, a reach of the FKC in the Project area passes
10 through Porterville, which has its own zoning designations. The six zoning designations
11 identified within the Project area are defined as follows (City of Porterville 2007, Tulare County
12 Resource Management Agency 2019, Kern County 2017):

- 13 • **Agricultural/Rural/Conservation (AC) (Porterville)** – This designation is intended to
14 preserve agricultural and resource conservation areas.
- 15 • **Exclusive Agricultural (AE)** – This designation is intended to apply primarily to rural
16 areas of the county generally characterized as having extensive or intensive agricultural
17 land uses.
- 18 • **Exclusive Agricultural 20 Acre Minimum (AE-20)** – This designation is defined as an
19 exclusive zone for intensive agricultural uses and for uses that are a necessary and
20 integral part of an agricultural operation. The purpose of this zone is to protect the
21 general welfare of the agricultural community by preventing encroachments by unrelated
22 agricultural uses that by their nature would be injurious to the physical and economic
23 well-being of the agricultural community. This zone is also intended to prevent or
24 minimize negative interactions between various agricultural uses. The minimum parcel
25 size permitted for this zone is, with certain exceptions, 20 acres.
- 26 • **Exclusive Agricultural 40 Acre Minimum (AE-40)** – The designation is defined as an
27 exclusive zone for intensive and extensive agricultural uses and for uses that are a
28 necessary and integral part of intensive and extensive agricultural operations. The
29 purposes of this zone include the following: (1) to protect the general welfare of the
30 agricultural community by preventing encroachments by unrelated uses that by their
31 nature would be injurious to the physical and economic well-being of the agricultural
32 community and the community at large; (2) to prevent or minimize negative interactions
33 between various agricultural uses; (3) to prevent or minimize land use conflicts or injury
34 to the physical or economic well-being of urban, suburban, or other non-agricultural uses
35 by agricultural uses; and (4) to provide for a minimum parcel standard that is appropriate
36 for areas where soil capability and cropping characteristics are such that a breakdown of
37 land into units of less than 40 acres would adversely affect the physical and economic
38 well-being of the agricultural community and the community at large. The minimum
39 parcel size permitted for this zone is, with certain exceptions, 40 acres.
- 40 • **Rural Residential (R-A)** – This designation applies to lands of from one to 10 acres used
41 primarily for residential use, with small-scale agricultural activities as a secondary use.

- 1 • **Right-of-Way (Miscellaneous [Z])** – This designation is defined as an easement that
2 allows a land use, such as a road or irrigation canal, to pass through land otherwise
3 dedicated to another use.

4 In Tulare County, the reach of the FKC in the Project area is mapped as being almost entirely
5 through agricultural lands zoned as AE composed of different parcel sizes (i.e., less than 10
6 acres, 20-acre minimum, and 40-acre minimum). Other zoning designations within the Project
7 area include rights-of-way having zoning designations Miscellaneous (Z) and R-A. Where it
8 passes near the unincorporated community of Strathmore (approximately MP 89 to MP 90.7), the
9 FKC is used to delineate the community’s eastern boundary (i.e., its urban development
10 boundary). It similarly forms much of the southwestern urban development boundary of
11 Porterville, where it passes through the city’s AC zone. Rural residential and commercial
12 (i.e., agricultural/industrial) land uses are infrequent in the Project area, although they do occur.

13 Kern County land uses consist predominantly of natural resources, open space, and productive
14 farmland (Kern Council of Governments 2018). Similar to Tulare County, land uses in Kern
15 County adjacent to the FKC are zoned for intensive agriculture (i.e., AE zoning) (Kern County
16 Assessor 2019). There are no residential land uses in or immediately adjacent to the Project area
17 between County Line Road and Lake Woollomes.

18 Table 3-6 summarizes the acreages of specific land use zoning designations inventoried in the
19 Project area. Figures G1 and G2 in Appendix G illustrate the land use zoning designations
20 mapped within the Project area specific to the CER Alternative and the CE Alternative,
21 respectively. In the Project area, the linear FKC is the dominant land use feature.

22 **Table 3-6. Land Use Zoning Designations Mapped in the Project Area**

Zoning Designation	CER Alternative Tulare (acres)	CER Alternative Kern (acres)	CER Alternative Total (acres)	CE Alternative Tulare (acres)	CE Alternative Kern (acres)	CE Alternative Total (acres)
Agricultural/Rural/Conservation (Porterville)	129	—	129	127	—	127
Exclusive Agriculture (AE)	8	99	107	5	37	42
Exclusive Agriculture – 20 Acre Minimum (AE-20)	1,473	—	1,473	1,180	—	1,180
Exclusive Agriculture – 40 Acre Minimum (AE-40)	549	—	549	526	—	526
Rural Residential (R-A)	0.1	—	0.1	0.1	—	0.1
Right-of-Way (Miscellaneous [Z])	284	—	284	287	—	287
No Zoning Information Provided	50	103	153	55	101	156
ALL ZONING INVENTORIED	2,494	202	2,695.1	2,180	138	2,317

23 Source: Porterville 2007; Tulare County 2019, Kern County 2019a

1 **Important Farmland**

2 Designated important farmland in Tulare County and Kern County was identified by reviewing
3 information from the California Department of Conservation’s (DOC’s) Farmland Mapping and
4 Monitoring Program (FMMP) (DOC 2019) and through the use of GIS data provided by the
5 counties (Kern County 2019b, Tulare County 2019). Designations used to classify land into one
6 of the eight FMMP important farmland categories identified in the Project area are defined as
7 follows (DOC 2019):

- 8 • **Prime Farmland** – Land that has the best combination of physical and chemical
9 characteristics for crop production. This land has the soil quality, growing season, and
10 moisture supply needed to produce sustained high yields of crops when treated and
11 managed.
- 12 • **Farmland of Statewide Importance** – Land other than Prime Farmland that has a good
13 combination of physical and chemical characteristics for crop production. This land has
14 minor shortcomings, such as greater slopes or less ability to store soil moisture than
15 Prime Farmland.
- 16 • **Unique Farmland** – Land that does not meet the criteria for Prime Farmland or
17 Farmland of Statewide Importance, but that has been used for the production of specific
18 crops with high economic value. This land is usually irrigated but may include non-
19 irrigated orchards or vineyards, as found in some climatic zones in California.
- 20 • **Farmland of Local Importance** – Land that either is currently producing crops or has
21 the capability of production but does not meet the criteria of the categories above.
22 Farmland of Local Importance is defined by each county’s local advisory committee and
23 adopted by its board of supervisors.
- 24 • **Grazing Land** – Land on which the vegetation is suited to the grazing of livestock. The
25 minimum mapping unit for Grazing Land is 40 acres.
- 26 • **Urban and Built-Up Lands** – Land occupied by structures with a density of at least one
27 dwelling unit per 1.5 acres.
- 28 • **Other Land** – Land not included in any other mapping category. Common examples
29 include low-density rural developments; brush, timber, wetland, and riparian areas not
30 suitable for livestock grazing; confined livestock; and water bodies smaller than 40 acres.
31 Vacant and non-agricultural land surrounded on all sides by urban development and
32 larger than 40 acres is mapped as Other Land.
- 33 • **Land Committed to Nonagricultural Use (Vacant or Disturbed)** – Vacant areas;
34 existing lands that have a permanent commitment to development but have an existing
35 land use of agricultural or grazing lands. Use of this designation is optional.

36 *Important Farmland* is classified by DOC as Prime Farmland, Farmland of Statewide
37 Importance, Unique Farmland, or Farmland of Local Importance. These designations are defined
38 together under the terms “Agricultural Land” and “Important Farmland” in the CEQA Guidelines
39 (Public Resources Code Sections 21060.1 and 21095) (FindLaw 2019) and Appendix G of the
40 State CEQA Guidelines.

1 The DOC’s 2016 Land Conservation Act status report (DOC 2016a) was used to determine the
2 most current mapped volumes of lands in Tulare and Kern Counties under Williamson Act⁸
3 contracts.

4 Roughly half of the more than 8-million acres that constitute Tulare and Kern Counties are tied
5 to agriculture through active cultivation, grazing, processing, infrastructure, or conservation.
6 These counties are two of the eight California counties in the San Joaquin Valley, the most
7 productive agricultural region in the world, with more than 250 crops under cultivation
8 (University of California, Davis 2017). Kern County was the state’s leading agricultural county
9 in 2018, with a production value of \$7.25 billion, while Tulare County was second in value of
10 production at \$7.04 billion (California Department of Food and Agriculture 2018). Cattle are
11 also among the top agricultural commodities produced by both Kern and Tulare Counties
12 (California Department of Food and Agriculture 2018). The main crops adjacent to the FKC in
13 Tulare County are grapes, nuts, and alfalfa. In Kern County, grapes are currently the dominant
14 cultivated crop grown on lands adjacent to the Project alignment.

15 Between 2014 and 2016⁹, Tulare County’s designated important farmlands incurred a loss (net
16 acreage change to other uses) of approximately 1,052 acres (DOC 2016b). During that same
17 period, Kern County experienced a net loss of 4,605 acres of important farmlands (DOC 2016c).
18 Important farmland, including grazing, accounted for approximately 82 percent (1.3 million
19 acres of important farmland out of 1.6 million acres) and 52 percent (2.7 million acres of
20 important farmland out of 5.2 million acres) of the total land area in Tulare and Kern Counties,
21 respectively (DOC 2016b, 2016c).

22 Table 3-7 summarizes the acreages of important farmland and other lands inventoried in the
23 Project area between 2014 and 2016. Figures G3 and G4 in Appendix G illustrate the locations
24 of farmlands mapped within the Project area specific to the CER Alternative and the CE
25 Alternative, respectively. In the Project area, the linear FKC is the dominant existing land use
26 feature.

⁸ The Williamson Act, also known as the California Land Conservation Act of 1965, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use for 10 or more years, renewed annually. In return, landowners receive property tax assessments that are much lower than normal because they are based on farming and open space uses as opposed to full market value. (DOC 2019c, Tulare County 2012)

⁹ This reflects the currently available data.

1 **Table 3-7. Total Acres of Farmland Mapping and Monitoring Program Farmland and**
 2 **Other Categories Mapped in the Project Area between 2014 to 2016**

Classification	CER Alternative Tulare (acres)	CER Alternative Kern (acres)	CER Alternative Total (acres)	CE Alternative Tulare (acres)	CE Alternative Kern (acres)	CE Alternative Total (acres)
FMMP Important Farmland Categories						
Prime Farmland	860	53	913	658	29	687
Farmland of Statewide Importance	613	76	689	503	42	545
Unique Farmland	456	21	478	456	21	477
Farmland of Local Importance	355	—	355	356	—	356
Grazing Land	9	—	9	9	—	9
Total – FMMP Designated Important Farmlands	2,293	150	2,444	1,982	92	2,074
Other Categories						
Urban and Built-Up Land	46	—	46	47	—	48
Other (water)	—	44	44	—	44	44
Land Committed to Non-Agricultural Use (Vacant or Disturbed)	43	—	43	43	—	43
Semi-Agricultural and Rural Commercial Land	12	7	20	12	2	14
Non-Agricultural and Natural Vegetation	36	—	36	33	—	33
Rural Residential Land	63	—	63	63	—	63
Total Other Categories	200	52	252	198	46	245
TOTAL AREA INVENTORIED	2,493	202	2,696	2,180	138	2,319

3 Source: Tulare County 2019, Kern County 2019a

4 Tulare County and Kern County are among the top participating counties for Williamson Act
 5 contract lands (by acreage enrollment) in California (DOC 2016a). Approximately 1.1 million
 6 acres or 36 percent of total county acreage in Tulare County and 1.7 million acres or 33 percent
 7 of Kern County were under a Williamson Act contract in 2015. In Kern County, all agricultural
 8 lands (except the six parcels noted below) adjacent to the FKC from the county line to Lake
 9 Woollomes (MPs 116.8 to 119.5) are designated important farmlands under active Williamson
 10 Act contracts (Kern County 2019b). A minor exception (i.e., lands not under a Williamson Act
 11 contract) is a grouping of six parcels located at the southwest corner of the SR 155/FKC
 12 intersection. These parcels are, however, designated important farmlands. There are currently
 13 about 1,045 acres of lands in the CER Alternative Project area under Williamson Act contracts in
 14 Tulare County and 53 acres in Kern County, and about 788 acres and 0.6 acre in Tulare and Kern
 15 Counties, respectively, in the CE Alternative Project area (Tulare County 2019).

1 **Noise**

2 Noise terms used in this section are defined in Appendix H. Noise is typically defined as
3 unwanted sound. High noise levels are known to have adverse effects on people, including
4 hearing loss, communication interference, sleep interference, physiological responses, and
5 annoyance. The noise environment typically includes background noise generated from both
6 close and distant noise sources as well as sound from individual local sources.

7 The primary contributor to background noise and vibration in the Project area is vehicular traffic.
8 Railroad and aeronautical noise sources also exist around the Project area and are included in the
9 background ambient noise and vibration conditions. Railroad and the majority of aeronautical
10 noise and vibration sources are located at distances greater than one mile from the Project
11 construction areas, which limits their contribution to background noise and vibration levels
12 experienced by identified sensitive receptors. An exception is Eckert Field, which is located
13 approximately 0.50 mile directly east of the FKC near the community of Strathmore in Tulare
14 County. Eckert Field is a public airport that has an average of 74 flight take offs/landings per
15 week by single engine airplanes and glider airplanes, which represent a limited contribution to
16 the ambient noise in the region (AirNav 2019). There is also one small municipal airport,
17 Porterville Airport, located approximately 1.5 miles east of the Project area south of Porterville
18 in Tulare County. Porterville Airport is a general aviation airport and supports small to midsize
19 aircraft. The FKC is not within the airport's safety zone or noise contour. There are no airports or
20 airstrips within the Project area in Kern County.

21 Noise sources such as parks, industrial facilities, and quarries are not located near the Project
22 area and therefore do not contribute to the existing noise environment. The predominant land use
23 near the Project area is related to agricultural activities. Activities associated with land
24 preparation, harvesting, and transporting of crops also contribute to the existing noise and
25 vibration environment near the Project area. Heavy off-road equipment used for agricultural
26 activities typically include tractors, harvesters, bailers, tillers, and seeders. Overflights for crop
27 spraying also occur in agricultural areas.

28 Generally, any place where quiet is an essential element of a land use's intended purpose would
29 qualify as a noise-sensitive receptor. Such noise-sensitive receptors include outdoor concert
30 pavilions and historic monuments with significant outdoor use. Places where people normally
31 sleep, like residences, hotels, and hospitals, are also considered noise-sensitive receptors. For
32 these types of receptors, nighttime sensitivity to noise must be considered. Various institutional
33 land uses where excessive noise could interfere with speech, meditation, and concentration also
34 qualify as noise-sensitive receptors. These land uses include schools, libraries, theaters, churches,
35 cemeteries, monuments, and museums. Parks may also be considered noise-sensitive receptors,
36 but this classification depends on their use. For example, a park used primarily for active
37 recreation would not be considered a noise-sensitive receptor (Federal Transit Administration
38 2018).

1 To achieve a clearly compatible land use/noise zone, a noise level standard of 60 A-weighted
2 decibels (dBA) L_{dn}^{10} is used for the exterior living areas of new single-family, duplex, and
3 mobile home residential land uses. A 45 to 65 dBA L_{dn} noise level standard is used for the
4 interior and exterior of all new multi-family residential uses (State of California, Governor's
5 Office of Planning and Research 2017). For this analysis, these noise level standards are
6 considered ambient noise levels for the Project area.

7 In the Project area, sensitive receptors are generally concentrated around the community of
8 Strathmore and the City of Porterville. There are five schools located within 1,000 feet of the
9 FKC: Strathmore Elementary School and Strathmore Middle School in Strathmore, and William
10 R. Buckley Elementary School, Burton Middle School and Summit Charter Academy in
11 Porterville. All five schools are located in the northern portion of the Project area, north of the
12 Tule River. There are no schools located within a 0.25-mile distance south of Tule River.
13 Residences south of the Tule River are sporadic, but generally consist of single-family residences
14 associated with agricultural areas spread out along the FKC. There are no hospitals, nursing
15 homes, churches, libraries, or other typical noise-sensitive receptors within 500 feet of the
16 Project area.

17 **Transportation**

18 Most of the roads in the Project area are narrow, county-owned, undivided two-lane collectors
19 and local roads that are used primarily for access to agricultural lands and residential areas. State
20 highways that cross the FKC are SR 65 and SR 190 in Tulare County and SR 155 in Kern
21 County.

22 The Tulare County Association of Governments (TCAG) identifies specific routes as Farm to
23 Market (FTM) routes that connect local farms to the state highway system. Roads in the FTM
24 network are all subject to at least 300 truck trips per day. FTM roads that cross the FKC and
25 would potentially be affected by Project construction activities are Avenue 196, Avenue 128,
26 Road 192 (J27), East Terra Bella Avenue (J24), Avenue 56, Avenue 24, and Avenue 8 (TCAG
27 2019a). See Appendix B1, Table 1-2 and Attachment A for the CER Alternative, and Attachment
28 B for the CE Alternative, illustrating the roads affected by construction.

29 Existing Level of Service: Level of service (LOS) is a qualitative measure of the performance of
30 a transportation system element. The LOS for traffic is designated A through F, with LOS A
31 representing free-flowing conditions and LOS F representing severe traffic congestion.

32 Table 3-8 provides the average annual daily traffic (AADT) for, and other operating conditions
33 of, the affected road segments in the Project area obtained from the Caltrans Traffic Census
34 Program for the most recent available year (Caltrans 2017). As shown in Table 3-8, all the road
35 segments currently operate at an acceptable LOS D or better.

¹⁰ L_{dn} is the average equivalent sound level over a 24-hour period, referred to as the day/night noise level.

1 **Table 3-8. Existing Level of Service**

Road Segment	Jurisdiction	Lanes	Road Type	AADT	PHV	LOS	Acceptable LOS Threshold
SR 65 – PM 23.186 – Junction SR 155	Kern	2	Two-lane rural highway	7,500	450	C	D
SR 65 – PM 14.073 – Avenue 112	Tulare	2	Two-lane rural highway	11,900	820	D	D
SR 65 – PM 18.163 – Junction SR 190	Tulare	4	Multi-lane rural highway	28,500	1,610	C	D
SR 155 – PM 3.469 – Zachary Avenue	Kern	2	Two-lane rural highway	2,600	250	B	D
SR 155 – PM – 6.550 – Famoso Porterville Highway	Kern	2	Two-lane rural highway	1,600	160	B	D
SR 155 – PM 10.990 – Junction SR 65	Kern	2	Two-lane rural highway	450	40	B	D
SR 190 – PM 9.474 – Poplar/County Road 192	Tulare	2	Two-lane rural highway	6,100	380	C	D
SR 190 – PM 15.241 – Porterville, Junction SR 65	Tulare	2	Two-lane rural highway	10,600	620	D	D

2 Source: Caltrans 2017

3 Key: AADT = average annual daily trips; LOS = level of service; PM = highway milepost; PHV = peak hour volume

4 Roads in the Project area have low pedestrian and bicycle activity. There are a limited number of
 5 dedicated bicycle paths, lanes, or routes and dedicated pedestrian facilities within the Project
 6 area. Although there are no sidewalks or designated bicycle lanes along the Project alignment,
 7 SR 65 and SR 155 are deemed state highway-accessible bikeways (Kern Council of
 8 Governments 2012, Caltrans 2019). Because of the rural nature of the area through which the
 9 FKC passes, bicycle and pedestrian use of local and arterial roads is often shared with motor
 10 vehicle traffic.

11 Thirty-seven Tulare County roads, three Kern County roads, and five state highways cross the
 12 FKC Middle Reach. Modification of county or state roads for construction access is not
 13 expected. Forty-five bridges cross the Project alignment. Table 1-2 in Appendix B1 provides a
 14 list of the bridges that cross the alignment that would require alteration or replacement. Access to
 15 contractor staging areas would be by way of Avenue 196, Avenue 194, Avenue 174, Avenue
 16 170, Rockford Road, Terra Bella Avenue, Avenue 64, Avenue 56, Avenue 4, County Line Road,
 17 and Cecil Avenue.

18 **Tribal Cultural Resources**

19 **Ethnography**

20 Prior to Euro-american arrival in the region, California was inhabited by groups of Native
 21 Americans speaking more than 100 languages and occupying a variety of ecological settings.

1 The Yokuts, a member of the Penutian language family, inhabited the San Joaquin Valley and
2 are generally divided into three groups: the Northern Yokuts, Foothill Yokuts, and Southern
3 Yokuts. Within these regional designations, specific populations are further delineated into
4 tribes. Individual Yokut tribes were distinguishable by their self-described name, dialect, and
5 geographical territory (Kroeber 1925, Latta 1949, Wallace 1978).

6 The Project area is located within the Southern Yokut ancestral territory and more specifically,
7 the geographical territories of the *Koyeti*, *Wolwol*, and *Choynok* tribes. The *Koyeti* were known to
8 occupy the area around the Tule River near Porterville; the *Wolwol* occupied the area between
9 the Tule and Kern Rivers; and the *Choynok*, occupied the Lower Kaweah River (Latta 1949,
10 Wallace 1978). There are known Southern Yokuts village sites to the east (along the Tule River),
11 west (along the Tule River), and south of Porterville along the edge of the San Joaquin Valley
12 near the Sierra Nevada foothills (Wallace 1978). There are no identified ethnographic villages
13 close to the Project area (Latta 1949, Wallace 1978).

14 **Tribal Cultural Resources Investigations and Results**

15 Tribal consultation is required by NEPA when a federally recognized tribe may be affected by
16 the project. Reclamation submitted a Sacred Lands File and Native American Contracts List
17 Request form to the Native American Heritage Commission (NAHC) on September 18, 2014.
18 The NAHC responded on September 29, 2014 with a list of Native American tribe contacts with
19 potential cultural resources in the project area.

20 From September 2014 through August 2019, this list was further refined to those tribes,
21 organizations, and individuals that had expressed an interest in participating in the Section 106
22 NHPA process. On August 15, 2019, Reclamation sent letters to the following Native American
23 tribes: Amah Mutsun Tribal Band, Chowchilla Tribe of Yokuts, North Fork Rancheria of Mono
24 Indians of California, North Valley Yokuts Tribe, Picayune Rancheria of Chukchansi Indians of
25 California, Santa Rosa Indian Community of the Santa Rosa Rancheria, Table Mountain
26 Rancheria of California, Tejon Indian Tribe, and Tule River Indian Tribe. See Attachment B of
27 Appendix J for an example of the letter described above. The letters invited the tribes to participate
28 in the NHPA Section 106 consultation process for the Proposed Project and requested
29 information under Section 106 of the NHPA regarding the identification of cultural resources in
30 the Proposed Project area. Reclamation conducted additional efforts, including phone calls and
31 emails, to confirm receipt of the letters. No tribes requested consultation.

32 The NAHC was also contacted to review its Sacred Lands file to identify any Native American
33 cultural resources that might be affected by the Project. The results of the search of the NAHC
34 Sacred Lands file were negative. In addition, pedestrian surveys that were conducted within the
35 Project APE did not identify any evidence to suggest the presence of Tribal Cultural Resources
36 (TCRs).

37 CEQA lead agencies are required to consult with California Native American Tribes (state
38 tribes) under Assembly Bill 52. To date, FWA has not received any formal requests from state
39 tribes regarding notification of proposed projects where FWA is acting as the CEQA lead
40 agency. On September 3, 2019, FWA submitted a Sacred Lands file search request to the NAHC
41 for the Project. The NAHC responded on September 3, 2019 with a contact list of sixteen Native
42 American tribes with potential knowledge of cultural resources in the Project area. FWA sent

1 letters to each of the Native American Tribes on December 23, 2019. No tribes have responded
2 with any information or knowledge of any TCRs in the Project area or requested consultation
3 with FWA for the Project as of the writing of this document.

4 **Utilities and Service Systems and Energy**

5 **Wastewater**

6 Some of the unincorporated areas of Tulare and Kern Counties are serviced by individual or
7 community septic systems. Wastewater collection systems, including sanitary sewer pipelines,
8 leach fields, and septic systems, are likely to occur in the Project area at various locations from
9 Lindsay to McFarland.

10 Wastewater in Porterville is collected through six- to 36-inch pipelines. The Porter Vista Public
11 Utility District owns and maintains sewer collection services for the Porter Vista development
12 area, which is generally north of SR 190, south of Olive Avenue, and east of Main Street in
13 Porterville. The Porterville Wastewater Treatment Facility (WWTF), located at the southwest
14 corner of West Grand Avenue and North Prospect Street, collects and treats wastewater from the
15 City of Porterville; the facility has a capacity of 8-million gallons per day (City of Porterville
16 2008).

17 The Strathmore Public Utilities District (SPUD) provides sanitary sewer collection, treatment,
18 and disposal services to residents in the community of Strathmore. The SPUD owns and operates
19 a WWTF located southwest of the community that provides primary treatment for wastewater
20 collected in the community. The capacity of the Strathmore WWTF is 0.40 million gallons per
21 day (Strathmore 2015).

22 **Water**

23 Water for agricultural use in Tulare and Kern Counties is conveyed largely by canals; water for
24 domestic use in the more developed areas, such as the cities of Porterville, McFarland, and
25 Lindsay, is conveyed by pipelines. In unincorporated areas of the two counties, domestic water is
26 supplied by a combination of lakes, reservoirs, and groundwater. There are no domestic
27 groundwater wells in the Project area.

28 Water for Porterville is distributed through approximately 200 miles of pipelines that are
29 maintained and operated by the City of Porterville's Public Works Department. Porterville's
30 water distribution system is generally served by groundwater wells and surface water (i.e.,
31 reservoirs). Additionally, the City of Porterville uses wastewater effluent (recycled water) for
32 groundwater recharge and crop irrigation (City of Porterville 2008).

33 The SPUD operates a water supply and distribution system under the jurisdiction of the
34 California Department of Health Services Division of Drinking Water and Environmental
35 Management. The water supply for the community of Strathmore is provided through a
36 subcontract with Tulare County for water from the Cross Valley Canal through an exchange with
37 Arvin-Edison Water Storage District. A water filtration plant was constructed in Strathmore as a
38 joint venture between SPUD and the Lindsay-Strathmore Irrigation District. Additional water
39 supply in Strathmore is provided by groundwater wells (Strathmore 2015).

1 **Stormwater**

2 Stormwater infrastructure in Tulare and Kern Counties is limited to the urban areas where
3 stormwater drainage is present. The more rural areas are drained primarily by overland flow into
4 human-made ditches, natural drainage swales, and watercourses that discharge into waterways.
5 The City of Porterville generally maintains drainage facilities in the public rights-of-way, on
6 public easements, and on property owned in fee by the City. Additionally, the City owns
7 approximately 25 stormwater basins that are currently sized to accept only flood waters (City of
8 Porterville 2008).

9 **Energy**

10 ***Electricity***

11 Electric service in the Project area is provided primarily by Southern California Edison
12 (Southern California Edison 2019). According to the California Energy Commission (CEC),
13 Tulare County has approximately 46 active power plants with a combined capacity of
14 approximately 427 megawatts (CEC 2019). Kern County has approximately 213 active power
15 plants that have a combined capacity of approximately 11,125 megawatts (CEC 2019). In 2018,
16 total use of electricity in Tulare County was 4,512.91 million kilowatt-hours and in Kern County
17 was 15,942.40 million kilowatt-hours (CEC 2020a). Power generation facilities in both Tulare
18 and Kern Counties consist primarily of solar and wind facilities, with other minor coal, gas, and
19 hydro facilities. Transmission lines traverse Tulare and Kern Counties largely in a north-south
20 orientation, with a majority of the transmission lines owned and operated by Southern California
21 Edison, Pacific Gas and Electric Company, and Los Angeles Department of Water and Power
22 (CEC 2016).

23 ***Natural Gas***

24 The total natural gas consumption in the U.S. in 2018 was about 30 trillion cubic feet, with
25 California accounting for less than 2.14 million cubic feet or less than 0.01 percent of the total
26 U.S. consumption (U.S. Energy Information Administration 2020). Statewide, natural gas use is
27 predominantly for electricity generation (approximately 45 percent). Residential, industrial, and
28 commercial uses account for 21, 25, and nine percent, respectively (CEC 2020b). California
29 produces approximately 10 percent of the total natural gas that is used in the state, with the
30 remainder being imported from five interstate pipelines (CEC 2020b). In 2018, the total
31 consumption of gas in Kern County was 2,455.53 million therms and Tulare County was 157.29
32 million therms (CEC 2020c).

33 ***Gasoline***

34 Gasoline is the most used transportation fuel in California. The CEC estimates that
35 approximately 15.5 billion gallons of gasoline were sold in 2018 (CEC 2020d). Weekly refinery
36 production of gasoline in California was reported to be about 6.7 million barrels for the week of
37 December 27, 2019 (CEC 2020d).

38 ***Diesel***

39 Diesel fuel is the second most used transportation fuel in California, accounting for
40 approximately 17 percent of the total fuel sales (CEC 2020e). Weekly refinery production of
41 diesel fuel in California was reported to be about 2.8 million barrels for the week of December
42 27, 2019 (CEC 2020d).

Chapter 4. Environmental Consequences/ Environmental Impacts

Introduction

This section provides detailed descriptions of the environmental consequences/impacts anticipated from construction and operation of the Project Alternatives, consistent with NEPA and the CEQA Guidelines.

A NEPA environmental document must, in accordance with NEPA guidance (40 10 CFR 1508.27), consider the context and intensity of its effects that would be caused by, or result from, a project. These factors were taken into consideration when developing the significance criteria under which each resource was evaluated under NEPA to develop impact conclusions. Thresholds may be quantitative or qualitative; they may be based on agency or professional standards or on legislative or regulatory requirements that are relevant to the impact analysis. Significance criteria used in this Final EIS/R are based on the checklist presented in Appendix G of the State CEQA Guidelines; factual or scientific information and data; and regulatory standards of federal, state, regional, and local agencies. These thresholds also include the context and intensity pursuant to NEPA, to determine the significance of the action and are described, as appropriate, for each resource.

A CEQA environmental document must identify the potentially significant environmental effects of a project. A significant effect means a “*substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project* (State CEQA Guidelines, Section 15382).” CEQA also requires that the environmental document propose feasible measures to minimize significant adverse impacts (State CEQA Guidelines, Section 15126.4(a)). ECs/MMs listed in Chapter 2 and described in Appendix B2 are included as part of the Project Alternatives under NEPA and serve as mitigation under CEQA to reduce potentially significant impacts.

According to CEQA Guidelines Section 15128, effects determined not to be significant do not need to be discussed in detail in an EIR. Additionally, 40 CFR Section 1502.15 requires that the EIS succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration. Pursuant to the EA/IS that was prepared by Reclamation and FWA, the resources that would have no impact or less than significant impacts are not further analyzed in this EIS/R. Further, for the remaining resources that are discussed in this document, any significance threshold that was previously determined to have no impact or less than significant impacts in the EA/IS are also not further analyzed in this EIS/R. The EA/IS, included as Appendix D, provides explanations for why resource topics or thresholds within the individual resource topics are not discussed further in this EIS/R.

1 Air Quality

2 Significance Criteria

3 The significance criteria described below were developed in accordance with the CEQA
4 Guidelines to determine the significance of potential impacts related to air quality. Impacts
5 would be significant if an alternative would:

- 6 • Conflict with or obstruct implementation of the applicable air quality plan.
- 7 • Result in a cumulatively considerable net increase of any criteria pollutant for which the
8 project region is in non-attainment under an applicable federal or state ambient air quality
9 standard.
- 10 • Expose sensitive receptors to substantial pollutant concentrations.

11 Air pollutant emissions have both regional and localized effects. This analysis assesses the
12 regional effects of the project's criteria pollutant emissions in comparison to SJVAPCD
13 thresholds of significance for construction activities. Localized emissions from Project
14 construction are also assessed using concentration-based thresholds that determine if the Project
15 would result in a localized exceedance of any ambient air quality standards or would make a
16 cumulatively considerable contribution to an existing exceedance.

17 The primary pollutants of concern during Project construction are reactive organic gases (ROG),
18 nitrogen oxides (NO_x), particulate matter 10 microns or less in diameter (PM₁₀), and particulate
19 matter 2.5 microns or less in diameter (PM_{2.5}). The SJVAPCD Guidance for Assessing and
20 Mitigating Air Quality Impacts (GAMAQI) adopted in 2015 contains thresholds for CO, NO_x,
21 ROG, SO_x, PM₁₀, and PM_{2.5}. Criteria air pollutant emissions were compared to the SJVAPCD
22 regional significance thresholds published in its GAMAQI and shown in Table 4-1 to determine
23 the significance under CEQA and to the General Conformity Rule (GCR) *de minimis* thresholds
24 pursuant to the Clean Air Act to determine the effects under NEPA. If emissions exceed the
25 SJVAPCD significance thresholds, mitigation measures would be required for the impacts to be
26 considered less than significant. If emissions exceed the GCR *de minimis* thresholds, a general
27 conformity analysis would be required.

28 **Table 4-1. Air Quality Thresholds of Significance**

Pollutant/Precursor	SJVAPCD Construction Emissions (tons per year)	SJVAPCD Construction Screening Thresholds (lbs per day)	GCR <i>de minimis</i> thresholds (tons per year)
Carbon monoxide (CO)	100	100	100
Nitrogen oxides (NO _x)	10	100	10
Reactive organic Gases (ROG)	10	100	10
Sulfur oxides (SO _x)	27	100	100
Particulate matter, PM ₁₀	15	100	100
Particulate matter, PM _{2.5}	15	100	70

1 Key: PM_{2.5} = particulate matter 2.5 microns or less in diameter; PM₁₀ = particulate matter 10 microns or less in
2 diameter
3 Sources: SJVAPCD 2015, EPA 2017

4 The SJVAPCD has published guidance on determining the significance of localized impacts to
5 state and federal ambient air quality standards in its GAMAQI. State and federal ambient air
6 quality standards have been established to protect public health and welfare from the adverse
7 impacts of air pollution. A project would be considered to have a significant impact if its
8 emissions are predicted to cause or contribute to a violation of any CAAQS or NAAQS. The
9 SJVAPCD applies a threshold of 100 pounds per day of any criteria pollutant as a screening
10 threshold. If the Project does not exceed 100 pounds per day of any criteria pollutant, then it can
11 be assumed that it would not cause a violation of an ambient air quality standard. If a project
12 exceeds 100 pounds per day then additional refined modeling would be necessary to determine if
13 the emissions would cause an exceedance of the CAAQS or NAAQS.

14 The SJVAPCD also provides the following thresholds of significance for TAC emissions from
15 operation of both permitted and non-permitted sources:

- 16 • Carcinogens – Maximally Exposed Individual risk equals or exceeds 20 in a million
- 17 • Non-Carcinogens: Acute and Chronic Hazard Index equals or exceeds 1 for the
18 Maximally Exposed Individual

19 Construction emissions are compared to the significance thresholds to determine whether the
20 impacts would be significant. For this analysis, only construction emission thresholds are used as
21 Project operations are assumed to be equivalent to existing conditions.

22 In addition, potential impacts were measured against the SJVAPD regulations described in the
23 following paragraphs.

24 **General Conformity Rule (GCR)**

25 Section 176 (c) of the Clean Air Act (42 United States Code [USC] 7506 [c]) requires any entity
26 of the federal government that engages in, supports, or in any way provides financial support for
27 licenses or permits or approves any activity to demonstrate that the action conforms to the
28 applicable SIP required under Section 110 (a) of the federal Clean Air Act (42 USC 7410[a])
29 before the action is otherwise approved. In this context, conformity means that such federal
30 actions must be consistent with a SIP's purpose of eliminating or reducing the severity and
31 number of violations of the NAAQS and achieving expeditious attainment of those standards.
32 Each federal agency must determine that any action proposed that is subject to the regulations
33 implementing the conformity requirements will, in fact, conform to the applicable SIP before the
34 action is taken. This Project is subject to the GCR because it involves a federal agency
35 (Reclamation).

1 The general conformity regulations apply to a proposed federal action in a nonattainment or
2 maintenance area if the total of direct¹¹ and indirect¹² emissions of the relevant criteria pollutants
3 and precursor pollutants caused by the proposed action equal or exceed certain *de minimis*
4 amounts, thus requiring the federal agency to make a determination of general conformity.

5 **District Rule 9510**

6 District Rule 9510 (Indirect Source Review [ISR]) is intended to reduce a project's impact on air
7 quality through project design elements or mitigation by payments of applicable off-site
8 mitigation fees. Compliance with Rule 9510 will reduce construction exhaust NO_x and PM₁₀
9 emissions by 20 percent and 45 percent, respectively. The ISR rule applies to two categories of
10 projects: development and transportation or transit projects. Projects that meet any of the
11 applicability criteria must file an ISR Application also known as an air impact assessment
12 application. While the Project is not a traditional development or transportation or transit project,
13 it would fall under the criteria of 9,000 square feet of other that the SJVAPCD has used to
14 encompass non-development projects, such as flood control basins, parking lots, etc.

15 **Toxic Air Contaminants Thresholds**

16 Construction equipment and material hauling vehicles emit DPM that is classified as a TAC.
17 SJVAPCD's guidance specifies that TAC emissions from a project's operations be assessed.
18 Given the expected duration of construction (three years for the CER Alternative and 10 years
19 for the CE Alternative) and the proximity to sensitive receptors adjacent to portions of the
20 Project alignment, potential TAC emissions have been assessed for the Project in the impact
21 analysis below.

22 The SJVAPCD thresholds for TACs, are based on the measurable health impacts on sensitive
23 receptors. This threshold is an incremental increase in cancer risk greater than 20 persons per
24 million or a chronic hazard index greater than 1.

25 **Regulation VIII**

26 Regulation VIII is a series of rules designed to reduce fugitive dust from construction sites,
27 parking and staging areas, open areas, material storage areas, etc. Compliance with Regulation
28 VIII is required for all construction projects in the SJVAPCD's jurisdiction, including
29 implementation of specific District measures. For projects that disturb more than one acre or
30 would cause fugitive dust that would violate Regulation VIII, the District requires that
31 demonstration of receipt of a District-approved Dust Control Plan be made a condition of the
32 project approval.

¹¹ Direct emissions are those that are caused or initiated by the federal action and occur at the same time and place as the federal action.

¹² Indirect emissions are reasonably foreseeable emissions that are further removed from the federal action in time and/or distance and can be practicably controlled by the federal agency on a continuing basis (40 CFR 93.152).

1 **Environmental Consequences**

2 **No Action Alternative**

3 Under the No Action Alternative, no construction activities would occur, and air quality impacts
4 would be similar to existing conditions. Maintenance activities would be similar to or would
5 slightly increase over existing conditions due to aging infrastructure; however, they would not be
6 expected to result in a significant increase in air emissions. There is a potential decrease in
7 localized criteria pollutants due to expected reductions in groundwater pumping as a result of
8 implementation of SGMA and/or changes in irrigated agriculture associated therewith, resulting
9 in additional fallowed land. On a conservative basis, no changes in criteria pollutant emissions
10 were assumed under the No Action Alternative.

11 Under the No Action Alternative, reduced capacity in the FKC could lead to changes in
12 agricultural production, including land fallowing or conversion of agricultural lands to other
13 uses. Increases in uncultivated and undeveloped land could result in an increase of fugitive dust
14 related to wind erosion on undeveloped lands and could expose sensitive receptors to substantial
15 fugitive dust concentrations causing **significant** impacts on air quality.

16 **CER Alternative**

17 ***Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan.***

18 Criteria pollutant emissions from fugitive dust and from construction equipment, haul trucks, and
19 construction worker commute vehicles were estimated for the CER Alternative. Project-specific
20 construction equipment inventories were used to estimate construction emissions; the inventories
21 include details on the type, quantity, construction schedule, and hours of operation anticipated
22 for each piece of equipment for each construction phase. Operational activities, including
23 maintenance and inspection services, are not anticipated to increase after completion of
24 construction; therefore, operational emissions were not estimated.

25 The air quality analysis used methodologies consistent with the California Emissions Estimator
26 Model (CalEEMod) to estimate equipment emissions; spreadsheets were also created
27 incorporating the SJVAPCD's emissions and load factors from OFFROAD2017 to estimate
28 construction emissions and EMFAC2017 to estimate on-road mobile source emissions for diesel-
29 fueled equipment. Construction equipment fleet mixes were developed based on the size of the
30 CER Alternative (acres) and the best judgement of the Project engineers and professional staff.
31 The schedule for constructing the CER Alternative was used to determine how site preparation
32 and other construction activities would overlap.

33 Appendix E provides detailed information on the equipment assumptions and emission
34 calculations for the CER Alternative. Table E-7 in the appendix shows that total construction-
35 related unmitigated NO_x emissions would exceed the SJVAPCD's annual significance threshold,
36 as well as the GCR *de minimis* thresholds and therefore would be significant.

37 The CER Alternative would be required to comply with all federal, state, and local regulations,
38 including the SJVAPCD's Rule 9510 and Regulation VIII (Fugitive PM₁₀ Prohibition).
39 Compliance with the Rule 9510 would reduce emissions of NO_x by 20 percent. Additionally,
40 due to the exceedance of SJVAPCD's thresholds of significance, Reclamation and FWA would

1 enter into a Voluntary Emission Reduction Agreement with SJVAPCD, as required by EC/MM
2 AQ-2. As shown in Tables E-8a and E-8b in Appendix E, compliance with Regulation VIII and
3 Rule 9510 combined with implementation of ECs/MMs AQ-1 and AQ-2 would reduce impacts
4 to **less than significant** by reducing NO_x emissions below the SJVAPCD thresholds of
5 significance.

6 In addition, as NO_x emissions are reduced to less than 10 tons per year with the incorporation of
7 mitigation, which is below the GCR *de minimis* threshold for NO_x, Reclamation has determined
8 that the CER Alternative is in conformance with the Clean Air Act.

9 ***Impact AQ-2: Result in a cumulatively considerable net increase of any criteria pollutant for***
10 ***which the project region is non-attainment under an applicable federal or state ambient air***
11 ***quality standard.***

12 Under the NAAQS, Tulare and Kern Counties are currently designated as nonattainment for
13 ozone and PM_{2.5} and in attainment for PM₁₀. Under the CAAQS, the two counties are currently
14 designated as in nonattainment for ozone, PM₁₀, and PM_{2.5}, but in attainment for all other criteria
15 air pollutants (Table 3-1).

16 Per CEQA Guidelines Section 15064(h)(3), a lead agency may determine that a project's
17 incremental contribution to a cumulative effect is not cumulatively considerable if the project
18 would comply with the requirements of a previously approved plan or mitigation program,
19 including, but not limited to, an air quality attainment or maintenance plan that provides specific
20 requirements that would avoid or substantially lessen the cumulative problem in the geographic
21 area in which the project is located. As discussed under Impact AQ-1, total construction-related
22 NO_x emissions would exceed the SJVAPCD's annual significance threshold and would therefore
23 be significant. Operational activities, including maintenance and inspection services, are not
24 anticipated to increase after completion of construction; therefore, operational emissions were
25 not estimated. There is a potential for criteria air pollutant emissions to decrease due to expected
26 reductions in groundwater pumping as a result of implementation SGMA and/or changes in
27 irrigated agriculture associated therewith, resulting in additional fallowed land. On a
28 conservative basis, no changes in operational emissions were assumed.

29 Reclamation and FWA would comply with SJVAPCD Regulation VIII and Rule 9510, which
30 reduce fugitive dust and PM₁₀ and NO_x exhaust emissions, respectively. In addition,
31 Reclamation and FWA would implement ECs/MMs AQ-1 and AQ-2, which would further
32 reduce NO_x emissions below the SJVAPCD thresholds of significance. As shown in Tables E-8a
33 and E-8b in Appendix E, with implementation of ECs/MMs AQ-1 and AQ-2, the CER
34 Alternative would not result in a cumulatively considerable net increase in any criteria pollutant
35 for which the Project region is in nonattainment under an applicable federal or state ambient air
36 quality standard. Air quality impacts from construction of the CER Alternative would be **less**
37 **than significant** and would therefore not be cumulatively considerable.

38 ***Impact AQ-3: Expose sensitive receptors to substantial pollutant concentrations.***

39 As discussed above, construction of the CER Alternative would result in temporary emissions of
40 criteria pollutants and TACs, resulting in exposure by sensitive receptors near the Project area.

1 Appendix E provides detailed information on the equipment assumptions and emission
2 calculations for the CER Alternative. Sensitive receptors could be affected by construction-
3 generated air emissions, depending on their location and/or distance from construction activities.

4 **Fugitive Dust.** Construction of the CER Alternative would involve earth-moving activities that
5 would generate dust emissions. Fugitive dust can cause health concerns when airborne due to
6 potential inhalation. Depending on the location of the construction activity, sensitive receptors
7 could be exposed to substantial fugitive dust concentrations if the dust is not properly mitigated.
8 To minimize potential impacts on sensitive receptors, fugitive dust controls would be
9 implemented through compliance with SJVAPCD Regulation VIII (Fugitive PM₁₀ Prohibitions).
10 Regulation VIII compliance includes limiting visible dust emissions to 20 percent opacity
11 through the use of water or chemical dust suppressants, soil stabilization, speed limits, and
12 covering of storage piles and bulk materials. As shown in Appendix E, the total PM₁₀ emissions
13 (which includes fugitive PM₁₀) are less than 15 tons per year; therefore, this is a **less-than-**
14 **significant** impact.

15 **Valley Fever and Asbestos.** Impacts related to valley fever and asbestos would be **less than**
16 **significant**. See Impact discussion HAZ-1 for a discussion of potential impacts from exposure to
17 valley fever and asbestos, and related ECs/MMs (HAZ-1-1 and HAZ-1-2) to reduce impacts.

18 **TACs.** Construction activities under the CER Alternative would result in TAC emissions,
19 including DPM from diesel vehicles and generators. Exposure to DPM emissions could result in
20 health risks. CARB has identified DPM from diesel-fueled engines as a TAC. Health risks from
21 TACs are a function of both the concentration of the emissions and the duration of exposure.
22 Although construction equipment has the potential to generate DPM emissions, construction
23 activities would be both limited and intermittent along the Project alignment.

24 The most intensive construction activities and equipment use would not occur in any one
25 location for the duration of the three-year construction period. Construction activities in any one
26 location would only occur for up to about seven months (Deer Creek and White River check
27 structures), and there are few sensitive receptors near these locations (two within an approximate
28 0.25 mile distance to Deer Creek and none within 0.25 mile of White River). Proximity to
29 sources of TACs is critical for determining the impact. TAC emissions diminish substantially
30 between 500 and 1,000 feet from emission sources. At 0.25 mile, the distance would be well over
31 the 1,000 foot evaluation distance; therefore, exposure to nearby sensitive receptors from
32 construction of these structures would be negligible. In the portions of the CER Alternative that
33 would occur near higher densities of sensitive receptors (i.e., Strathmore or Porterville),
34 construction in any one location would only last for a few weeks; therefore, sensitive receptors
35 would not continually be exposed to a substantial amount of TACs.

36 The proposed concrete batch plant would operate for the duration of the three-year construction
37 period. There is only one sensitive receptor located approximately 0.9 mile west of the proposed
38 batch plant on Avenue 56. As described above, exposure to TACs is a greatly diminished beyond
39 1,000 feet; furthermore, the batch plant would be subject to SJVAPCD permitting and would be
40 required to submit an Authority to Construct application. The SJVAPCD would require the
41 preparation of a quantitative health risk assessment before issuing a permit to operate. The
42 SJVAPCD would not issue a permit to operate if the operation causes an exceedance of their

1 health risk thresholds of 20 in a million for cancer and exceeds one for acute or chronic hazard
2 index.; therefore, TACs associated with operation of the batch plant would not exceed a cancer
3 risk greater than or equal to 20 in a million or a chronic or acute hazard index greater than one.

4 Due to the short duration of construction activities near sensitive receptors and the lack of
5 sensitive receptors near areas with longer-term construction, impacts related to TACs from the
6 Proposed Project would be **less than significant**.

7 **Ambient Air Quality Standards.** A screening analysis was conducted for all criteria air
8 pollutants to determine if the CER Alternative had the potential to cause an exceedance of a
9 federal or state ambient air quality standard. As discussed previously, the SJVAPCD has
10 established a screening threshold of 100 pounds per day to determine if further analysis in the
11 form of an ambient air quality analysis is required. If a project generates less than 100 pounds
12 per day of a pollutant, it can be assumed that it would not cause a local exceedance of an ambient
13 air quality standard.

14 As shown in Appendix E, Table E-11, with the exception of CO, no other criteria air pollutant
15 exceeded 100 pounds per day. Because the Project's onsite construction emissions would exceed
16 100 pounds per day of CO, an ambient air quality analysis was conducted to determine if the
17 Project caused a local exceedance of the ambient air quality standard for CO. As shown in
18 Appendix E Table E-12, the CER Alternative would not cause an exceedance of the CO ambient
19 air quality standard.

20 The CER Alternative would not cause an exceedance of the CO ambient air quality standard.
21 Therefore, impacts to ambient air quality would be **less than significant**.

22 **Localized CO Emissions.** Localized exceedances of the CO standards have become increasingly
23 uncommon. The SJVAB is in attainment of the state and federal CO standards and background
24 levels of CO as measured at SJVAB monitoring stations continue to decline. Monitoring has
25 shown that the Valley's CO concentrations have not exceeded the NAAQS for more than a
26 decade (SJVAPCD 2019). Localized concentrations of CO are related to the levels of traffic and
27 congestion along streets and at intersections. For reference, a sensitivity analysis using
28 CALINE4 was conducted by the City of Fresno for its General Plan Master EIR in 2014, and it
29 was determined that traffic volumes of 36,000 peak hour trips would result in hourly CO
30 concentrations of 7.5 parts per million and an 8-hour concentration of 6.0 parts per million (City
31 of Fresno 2014). Construction of the CER Alternative would temporarily increase traffic
32 volumes on streets in the Project area, but nowhere near the 36,000 peak hour trips, which would
33 still not result in an exceedance of CO standards. Additionally, because the majority of the CER
34 Alternative would occur in rural areas with minimal existing traffic, CO emissions would be well
35 dispersed. Furthermore, since construction of the CER Alternative would be along a linear
36 alignment, CO emissions would not be concentrated in any one location for more than seven
37 months. Under the CER Alternative, the majority of construction activities within the more
38 populated areas of Strathmore and Porterville would occur for only a week to a few weeks near
39 any single sensitive receptor and would not result in exposure of sensitive receptors to substantial
40 pollutant concentrations.

1 As discussed above, because the Project’s onsite construction emissions would exceed 100
2 pounds per day of CO (see Table E-11 in Appendix E), an ambient air quality analysis was
3 conducted to determine if the Project caused a local exceedance of the ambient air quality
4 standard for CO. As shown in Appendix E Table E-12, the CER Alternative would not cause an
5 exceedance of the CO ambient air quality standard. Impacts related to localized CO emissions
6 from the CER Alternative would therefore be **less than significant**.

7 **CE Alternative**

8 ***Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan.***

9 Criteria pollutant emissions from fugitive dust and from construction equipment, haul trucks, and
10 construction worker commute vehicles were estimated for the CE Alternative. Project-specific
11 construction equipment inventories were used to estimate construction emissions; the inventories
12 include details on the type, quantity, construction schedule, and hours of operation anticipated
13 for each piece of equipment for each construction phase. Operational activities, including
14 maintenance and inspection services, are not anticipated to increase after completion of
15 construction; therefore, operational emissions were not estimated.

16 The air quality analysis used methodologies consistent with CalEEMod to estimate equipment
17 emissions; spreadsheets were also created incorporating the SJVAPCD’s emissions and load
18 factors from OFFROAD2017 to estimate construction emissions and EMFAC2017 to estimate
19 on-road mobile source emissions for diesel-fueled equipment. Construction equipment fleet
20 mixes were developed based on the size of the CE Alternative (acres) and the best judgement of
21 the Project engineers and professional staff. The schedule for constructing the CE Alternative
22 was used to determine how site preparation and other construction activities would overlap.

23 Appendix E provides detailed information on the equipment assumptions and emission
24 calculations for the CE Alternative. Table E-9 in the appendix shows that total unmitigated
25 construction-related NO_x would exceed the SJVAPCD’s annual significance threshold, as well
26 as the GCR *de minimis* thresholds, and therefore would be significant. The air quality impacts
27 from construction of the CE Alternative would exceed the SJVAPCD’s annual significance
28 thresholds as well as the GCR *de minimis* thresholds and therefore would be significant
29 (Appendix E Table E-9). The potential for the CE Alternative to conflict with or obstruct
30 implementation of an applicable air quality plan would be potentially significant. As shown in
31 Table E-10a and E-10b in Appendix E, like the CER Alternative, compliance with Regulation
32 VIII and Rule 9510 combined with implementation of EC/MM AQ-1, would reduce impacts to
33 **less than significant** by reducing NO_x emissions below the SJVAPCD thresholds of
34 significance.

35 As with the CER Alternative, NO_x emissions under the CE Alternative are less than 10 tons per
36 year with the incorporation of EC AQ-1, which is below the GCR *de minimis* threshold;
37 therefore, Reclamation has determined that the CE Alternative is in conformance with the Clean
38 Air Act.

1 ***Impact AQ-2: Result in a cumulatively considerable net increase of any criteria pollutant for***
 2 ***which the project region is non-attainment under an applicable federal or state ambient air***
 3 ***quality standard.***

4 As discussed under Impact AQ-1, total construction-related NO_x emissions would exceed the
 5 SJVAPCD's annual significance threshold. Operational activities, including maintenance and
 6 inspection services, are not anticipated to increase after completion of construction; therefore,
 7 operational emissions were not estimated.

8 Reclamation and FWA would comply with SJVAPCD Regulation VIII and Rule 9510, which
 9 reduce fugitive dust and PM₁₀ and NO_x exhaust emissions, respectively. In addition,
 10 Reclamation and FWA would implement EC/MM AQ-1, which would further reduce NO_x
 11 emissions below the SJVAPCD thresholds of significance. As shown in Table E-10a and E-10b
 12 in Appendix E, with implementation of EC/MM AQ-1, the CE Alternative would not result in a
 13 cumulatively considerable net increase in any criteria pollutant for which the Project region is in
 14 nonattainment under an applicable federal or state ambient air quality standard. Air quality
 15 impacts from construction of the CE Alternative would be **less than significant** and would
 16 therefore not be cumulatively considerable.

17 ***Impact AQ-3: Expose sensitive receptors to substantial pollutant concentrations.***

18 Daily and annual emissions and exposure to sensitive receptors would be similar to those
 19 discussed under AQ-3 for the CER Alternative (Tables E-11 and E-13 in Appendix E). The CE
 20 Alternative would result in temporary emissions of fugitive dust and criteria pollutants, resulting
 21 in exposure by sensitive receptors near the Project area. Sensitive receptors could be affected by
 22 construction-generated air emissions, depending on their location and/or distance from
 23 construction activities. Construction is expected to occur over 10 years, however construction of
 24 any one project feature would be similar in duration to the CER Alternative (i.e., up to about
 25 seven months in any one location over the 10-year construction period). Depending on the
 26 location of the construction activity, sensitive receptors could be exposed to substantial fugitive
 27 dust concentrations if the dust is not properly mitigated. To minimize potential impacts on
 28 sensitive receptors, fugitive dust controls would be implemented through compliance with
 29 Regulation VIII and the application of ECs/MMs HAZ-1-1 and HAZ-1-2, and impacts related to
 30 fugitive dust for the CE Alternative would be reduced to a **less-than-significant** level.

31 The proposed concrete batch plant would operate intermittently for the duration of the 10-year
 32 construction period, however there is only one sensitive receptor located approximately 0.9 mile
 33 west of the proposed batch plant on Avenue 56; similar to the CER Alternative, the batch plant
 34 would be subject to permitting from the SJVAPCD and would not be permitted if it caused an
 35 exceedance of the SJVAPCD's risk thresholds. Therefore, emissions associated with operation of
 36 the batch plant would not expose a significant number of sensitive receptors to substantial
 37 pollutant concentrations and impacts would be **less than significant**.

1 **Biological Resources**

2 **Significance Criteria**

3 The significance criteria described below were developed in accordance with the CEQA
4 Guidelines to determine the significance of potential impacts related to biological resources.
5 Impacts would be significant if implementing an alternative would:

- 6 • Have a substantial adverse effect, either directly or through habitat modifications, on any
7 species identified as a candidate, sensitive, or special-status species in local or regional
8 plans, policies, or regulations, or by the CDFW, USFWS, or National Marine Fisheries
9 Service (NMFS).
- 10 • Have a substantial adverse effect on any riparian habitat or other sensitive natural
11 community or critical habitat identified in local or regional plans, policies, or regulations
12 or by the CDFW, USFWS, or NMFS.
- 13 • Have a substantial adverse effect on state or federally protected wetlands (including, but
14 not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling,
15 hydrological interruption, or other means.
- 16 • Interfere substantially with the movement of any native resident or migratory fish or
17 wildlife species or with established native resident or migratory wildlife corridors, or
18 impede the use of native wildlife nursery sites.
- 19 • Conflict with any local policies or ordinances protecting biological resources, such as a
20 tree preservation policy or ordinance.

21 **Environmental Consequences**

22 **No Action Alternative**

23 Under the No Action Alternative, no construction activities would occur, and impacts on
24 biological resources would be similar to existing conditions. Maintenance activities would be
25 similar to or would slightly increase over existing conditions due to aging infrastructure. FWA
26 would continue to maintain the facilities in compliance with the USFWS biological opinion titled
27 *Formal Endangered Species Consultation on the Operations and Maintenance Program*
28 *Occurring on Bureau of Reclamation Lands within the South-Central California Area Office* that
29 was issued February 17, 2005, and with the *1600 Memorandum of Understanding for Canal*
30 *Maintenance and Restoration issued by CDFW* that was issued in January 2017. FWA would
31 continue to discharge flow from the Middle Reach of the FKC into Deer Creek and White River
32 without modifying the existing check structures and wasteways. Maintenance and operations of
33 the FKC would occur within the existing canal footprint and ROW and would not result in
34 significant impacts on biological resources.

35 Under the No Action Alternative, reduced capacity in the FKC could lead to changes in
36 agricultural production, including land fallowing or conversion of agricultural lands to other
37 uses. Reductions in agricultural lands such as alfalfa, which provides high-quality foraging
38 habitat for Swainson's hawk, could have substantial adverse effects and the impacts would be
39 **potentially significant.**

1 **CER Alternative**

2 The implementation of the CER Alternative would only have construction-related impacts.
 3 Operational impacts from implementation of the CER Alternative would generally be equivalent
 4 to existing conditions because ongoing OM&R of the FKC under this alternative would be
 5 comparable to existing conditions. Ongoing OM&R would continue to be implemented
 6 consistent with the 2005 USFWS biological opinion. As such, it is anticipated that the CER
 7 Alternative would not result in substantial new operational impacts, therefore, the impact
 8 discussion below focuses only on construction-related impacts. Construction impacts would be
 9 both temporary and permanent and would result from enlarging portions of the FKC and
 10 constructing a new canal next to the existing canal. Estimated temporary and permanent impacts
 11 on terrestrial and aquatic habitats are presented in Table 4-2.

12 **Table 4-2. Estimated Habitat Impacts**

Terrestrial Habitat	CER Alternative Temporary (acres)	CER Alternative Permanent (acres)	CE Alternative Temporary (acres)	CE Alternative Permanent (acres)
Agriculture: Fallow	301	40	308	15
Agriculture: Field Crop	158	28	166	20
Agriculture: Orchard	181	247	145	124
Agriculture: Vineyard	42	113	23	51
Allscale Scrub	0	1	0	1
Barren/Ruderal	506	0 ^a	489	0 ^a
California Buckwheat Scrub	5	4	0.3	7
Mulefat Thickets	0.5	1	0.5	1
Fremont Cottonwood Forest	1	0.9	0.9	0.9
Non-Native Annual Grassland	222	0 ^a	226	0 ^a
Urban	31	7	28	7
Aquatic Habitats				
Intermittent Stream: White River	0.5 (397 linear feet)	0	0.5 (397 linear feet)	0
Intermittent Stream: Deer Creek	0.5 (490 linear feet)	0	0.5 (490 linear feet)	0
Groundwater Recharge Basin	6.5	13.2	0.8	0.4 acre
Fresh Emergent Wetland	0	0	0	0
Irrigation Canal	0.8 (1,678 linear feet)	0.3 (681 linear feet)	0.9 (1,729 linear feet)	2.4 (5,915 linear feet)
Non-Vegetated Ditch	0	0.1 (526 linear feet)	0	0.06 (983 linear feet)
Pond	0.02	1.5	0.02	2
Riparian/Fresh Emergent Wetland	0.01	0	0.01	0
Riparian Wetland	0.9	0.7	1.01	0.7

Terrestrial Habitat	CER Alternative Temporary (acres)	CER Alternative Permanent (acres)	CE Alternative Temporary (acres)	CE Alternative Permanent (acres)
Seasonal Wetland	0	0	0	0

1 ^a The Project Alternatives will likely result in a net increase of barren/ruderal and grassland habitat due to conversion
2 of agricultural lands to canal embankments.

3 ***Impact BIO-1: Have a substantial adverse effect, either directly or through habitat***
4 ***modifications, on any species identified as a candidate, sensitive, or special status species in***
5 ***local or regional plans, policies, or regulations, or by CDFW, USFWS, or NMFS.***

6 The CER Alternative would have no effect on any species under the jurisdiction of NMFS as
7 there are none in the Project area that would be affected. The CER Alternative would have
8 potentially significant direct and indirect impacts on sensitive species under the jurisdiction of
9 CDFW or USFWS, as described in the discussion of impacts to biological resources for impacts
10 BIO-1a through BIO-11. With the implementation of ECs/MMs BIO-1a through BIO-11, which
11 provide for pre-construction surveys for special-status plants and animals to determine the
12 presence or absence of these species, implementation of a biological resources monitoring and
13 management plan, environmental awareness training for construction personnel, implementation
14 of general (e.g., litter control, marking construction areas, appropriate erosion control materials)
15 and species-specific (e.g., avoidance buffers, modifying timing of construction activities,
16 biological monitoring, preservation of habitats) measures, impacts would be avoided or
17 minimized to the extent practicable. Impacts on special-status species would therefore be **less**
18 **than significant** after implementation of the ECs/MMs.

19 ***Impact BIO-1a Special-Status Plants:*** Ground-disturbing activities for the CER Alternative and
20 the staging of equipment and materials are anticipated to temporarily affect (e.g., clearing an area
21 for construction access) annual grassland habitat. Five late-blooming special-status plant species
22 including Earlimart orache, Lost Hills crownscale, brittlescale, lesser saltscale, and subtle
23 orache) have a potential to occur in the annual grassland habitat. Although the annual grassland
24 habitat in the Project area provides generally poor habitat conditions for these species and their
25 likelihood of occurrence is low, their presence or absence cannot be determined until the
26 proposed botanical surveys in EC/MM BIO-1a.1 have been completed.

27 The CER Alternative is estimated to result in temporary impacts on approximately 222 acres of
28 annual grassland and is not expected to result in any permanent loss of this habitat type due to
29 the conversion of cultivated agricultural lands to canal embankments. Temporary impacts could
30 adversely affect special-status plants if they are present in the annual grassland habitats.
31 Implementation of ECs/MMs BIO-1a.1 through BIO-1a.4 would, however, reduce impacts to a
32 **less-than-significant** level.

33 ***Impact BIO-1b Special-Status Animals:*** Ground-disturbing activities for the CER Alternative,
34 including the staging of equipment and materials, could cause significant temporary and
35 permanent impacts on special-status animal species if they are present in the areas subject to
36 ground disturbance. ECs/MMs BIO 1b.1 through BIO 1b.7 are general measures that will reduce
37 potential impacts on all special-status species to a **less-than-significant** level.

1 **Impact BIO-1c Migratory Birds and Raptors:** Construction activities (e.g., vegetation removal,
2 bridge removal, and equipment operation) may be scheduled during the avian breeding season
3 (generally February 1 through August 31, depending on the species) and could disturb nesting
4 birds in or adjacent to the Project area. Construction-related disturbance could result in the
5 incidental loss of fertile eggs or nestlings or nest abandonment, which could potentially cause
6 significant impacts on local or regional populations of affected birds. Impacts on nesting birds
7 could result from:

- 8 • Tree and shrub removal, which would be necessary to accommodate the construction of
9 siphons and the adjacent canal;
- 10 • Ground-disturbing activities (e.g., grubbing and grading) in annual grasslands that could
11 affect ground-nesting birds (e.g., killdeer [*Charadrius vociferus*] and western
12 meadowlark [*Sturnella neglecta*]);
- 13 • Noise from construction activities; and
- 14 • Removal of bridges and other construction activities near the existing bridges that could
15 disturb or remove active cliff swallow nests if they are present.

16 Implementation of ECs/MMs BIO-1c.1 through BIO-1c.3 would reduce impacts on migratory
17 birds and raptors to a **less-than-significant** level.

18 **Impact BIO-1d Burrowing Owl:** If burrowing owls are present during construction activities, the
19 CER Alternative could result in a temporary loss of habitat for, and displacement of, owls due to
20 Project activities that affect potential burrow sites. Direct disturbance from construction
21 activities, such as operation of vehicles and heavy equipment and earth-moving operations
22 around burrows could cause significant impacts due to stress, injury, or mortality to individual
23 owls or destruction of their burrows. Although not observed during the biological field surveys,
24 burrowing owls may occupy burrows of small mammals within the Project area. The greatest
25 concentration of small mammal burrows in the Project area is along the embankments of the
26 FKC. Potential impacts are considered to be temporary because small mammal burrows are
27 expected to become reestablished along the enlarged canal or realigned canal segments after they
28 are constructed. ECs/MMs BIO-1d.1 through BIO-1d.3 would reduce potential impacts on
29 burrowing owls to a **less-than-significant** level.

30 **Impact BIO-1e Golden Eagle, Swainson's Hawk, Northern Harrier, and White-Tailed Kite:**
31 The CER Alternative could result in a temporary and permanent loss of foraging habitat and
32 displacement due to Project activities affecting potential nesting sites. Direct disturbance from
33 construction activities, such as operation of vehicles and heavy equipment and earth-moving
34 operations around active nests could cause significant impacts due to stress, injury, or mortality
35 to individuals. The CER Alternative would have temporary impacts on foraging habitat through
36 the staging of equipment, temporary construction access, and other construction activities.
37 Permanent impacts would result from the new canal embankment footprint and using large areas
38 of land to borrow soil to build up the new embankments.

39 In California, Swainson's hawk in particular has become increasingly dependent on agricultural
40 lands, especially alfalfa, for foraging. The estimated acreage of impacts on Swainson's hawk
41 foraging habitat with moderate to high suitability is shown in Appendix F, Section 7, Table 7.
42 ECs/MMs BIO-1e.1 through BIO-1e.4 would reduce the impacts on Swainson's hawk, golden
43 eagle, northern harrier, and white-tailed kite to a **less-than-significant** level.

1 ***Impact BIO-1f Pallid Bat, Townsend's Big-Eared Bat, Western Mastiff Bat, and Other***
2 ***Roosting Bats:*** Due to the ability of individual bats to move away from disturbances, direct
3 impacts on bats are not expected when the bats are not using a roost site for a maternity colony
4 (i.e., a breeding roost to bear and rear young). Bats may form maternity colonies in tree cavities
5 and large culverts in the Project area. If a tree or structure is removed that contains a bat
6 maternity colony, the disturbance could cause significant impacts due to bat mortality or injury.
7 Indirect impacts may occur from construction disturbances if a maternity colony is present in or
8 adjacent to the Project area. Significant noise disturbance could result in adults temporarily or
9 permanently leaving the maternity colony. The majority of tree removal for the CER Alternative
10 would be the Fremont cottonwood trees located just north of Deer Creek. Various concrete
11 culverts are also located throughout the Project alignment and would either be demolished or
12 expanded. Implementation of ECs/MMs BIO-1f.1 through BIO-1f.2 would reduce impacts on
13 bats to a **less-than-significant** level.

14 ***Impact BIO-1g Kern Brook Lamprey, San Joaquin Roach, and Game Fish:*** The CER
15 Alternative could result in temporary loss of aquatic habitat due to Project activities that affect
16 potential aquatic habitat. Direct disturbance from construction activities, such as dewatering for
17 rebuilding canal segments or siphon decommissioning, could cause significant impacts due to
18 stress, injury, or mortality to individuals. Implementation of EC/MM BIO-1g would reduce
19 impacts on Kern brook lamprey, San Joaquin roach, and game fish to a **less-than-significant**
20 level.

21 ***Impact BIO-1h Western Spadefoot:*** The CER Alternative could result in temporary loss of
22 habitat and displacement due to Project activities that affect potential aquatic breeding and
23 upland burrow sites. Direct disturbance from construction activities, such as operation of
24 vehicles and heavy equipment and earth-moving operations around burrows, could cause
25 significant impacts due to stress, injury, or mortality to individuals or destruction of their
26 burrows. Implementation of ECs/MMs BIO-1h.1 and BIO-1h.2 would reduce impacts on western
27 spadefoot to a **less-than-significant** level.

28 ***Impact BIO-1i Northern California Legless Lizard, California Glossy Snake, San Joaquin***
29 ***Coachwhip, and Coast Horned Lizard:*** Implementation of the CER Alternative could result in a
30 temporary loss of habitat and displacement due to Project activities that affect potential habitat.
31 Direct disturbance from construction activities, such as operation of vehicles and heavy
32 equipment and earth-moving operations around burrows, could cause significant impacts due to
33 stress, injury, or mortality to individuals or destruction of their burrows. Implementation of
34 EC/MM BIO-1i would reduce impacts on Northern California legless lizard, California glossy
35 snake, San Joaquin coachwhip, and coast horned lizard to a **less-than-significant** level.

36 ***Impact BIO-1j Buena Vista Lake Shrew:*** Implementation of the CER Alternative would result
37 in temporary impacts on approximately 0.9 acre of Fremont cottonwood forest and 0.5 acre of
38 mulefat thicket and permanent impacts on one acre of Fremont cottonwood forest and one acre
39 of mulefat thickets. Removal of this vegetation would reduce the amount of available foraging
40 habitat and vegetative cover, which may increase the risk of Buena Vista Lake shrew (BVLS)
41 mortality from starvation and/or exposure to the elements if any shrews are present in or near the
42 Project area, and such impacts would be significant. A Biological Assessment (BA) was
43 prepared to analyze the potential effects of the Project on federally listed species; the BA

1 concluded that the Project may adversely affect the endangered BVLS. Reclamation submitted
 2 the BA to the USFWS and initiated formal Section 7 consultation with the USFWS on the
 3 Project on December 23, 2019. On July 23, 2020, Reclamation received a biological opinion
 4 from the USFWS that concluded the Project is not likely to jeopardize the continued existence of
 5 BVLS (08ESMF00-2020-F-0350) (see Appendix N). All terms and conditions of the biological
 6 opinion have been incorporated as part of the CER Alternative. The terms and conditions of the
 7 biological opinion are the same as ECs/MMs BIO-1j.1 through BIO-1j.4 and their
 8 implementation would reduce impacts on BVLS to a **less-than-significant** level.

9 ***Impact BIO-1k American Badger:*** Construction may result in reproductive failure by disrupting
 10 foraging activities and precluding the formation of natal dens in and adjacent to the Project area.
 11 The loss of potential dens would negatively affect American badger if any are present in or
 12 adjacent to the Project area, and such impacts would be significant. However, implementation of
 13 EC/MM BIO-k would reduce impacts on American badger to a **less-than-significant** level.

14 ***Impact BIO-1l San Joaquin Kit Fox:*** Destruction of potential kit fox dens during construction
 15 may displace kit foxes and make them more susceptible to predation. Construction may also
 16 result in reproductive failure by disrupting foraging activities, increasing human disturbance, and
 17 precluding the formation of natal dens in the Project area. The loss of potential dens would
 18 negatively affect San Joaquin kit foxes if any are present in the Project area, and such impacts
 19 would be significant. Consequently, Reclamation included San Joaquin kit fox (SJKF) as part of
 20 their consultation efforts with USFWS. On July 23, 2020, Reclamation received a biological
 21 opinion from the USFWS that concluded the Project is not likely to jeopardize the continued
 22 existence of SJKF (08ESMF00-2020-F-0350) (see Appendix N). All terms and conditions of the
 23 biological opinion have been incorporated as part of the CER Alternative. The terms and
 24 conditions of the biological opinion are the same as ECs/MMs BIO-11.1 through BIO-11.4 and
 25 EC BIO-11.5 and with their implementation would reduce potential impacts on SJKF to a **less-**
 26 **than-significant** level.

27 ***Impact BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive***
 28 ***natural community identified in local or regional plans, policies, or regulations or by CDFW***
 29 ***or USFWS.***

30 The CER Alternative would have potentially significant impacts on sensitive natural
 31 communities. It would result in temporary impacts on approximately one acre and permanent
 32 impacts on approximately 0.9 acre of Fremont cottonwood forest habitat. Temporary impacts
 33 would result from removing trees and other vegetation to allow for construction equipment
 34 access, constructing siphons, and recontouring the streambank at Deer Creek. Permanent impacts
 35 would result from tree removal in the footprint of the expanded or realigned canal. No impacts
 36 on riparian habitat would occur at White River. In addition, there would be no temporary or
 37 permanent impacts on shining willow groves, red willow thickets, or valley oak woodland under
 38 the CER Alternative (Appendix F, Figures 5 and 6). With the implementation of ECs/MMs BIO-
 39 2a through BIO-2c, impacts on sensitive natural communities will be minimized, and these
 40 communities will be protected in place to the greatest extent practicable. Locations of
 41 environmentally sensitive areas will be identified on construction drawings and protected during
 42 construction. Large trees at Deer Creek will be removed only when necessary to complete siphon

1 construction. Therefore, the impacts would be **less than significant** after implementation of
2 ECs/MMs BIO-2a through BIO-2c.

3 ***Impact BIO-3: Have a substantial adverse effect on state or federally protected wetlands***
4 ***(including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling,***
5 ***hydrological interruption, or other means.***

6 The CER Alternative would result in temporary impacts (i.e., discharge of dredged or fill
7 material) on 0.5 acre (490 linear feet) of intermittent stream channel, 0.01 acre of riparian/fresh
8 emergent wetland, and 0.84 acre of riparian wetlands at Deer Creek; and temporary impacts on
9 0.5 acre (397 linear feet) of intermittent stream channel and 0.03 acre of riparian wetlands at
10 White River. The temporary impacts would occur as a result of construction equipment access,
11 decommissioning/constructing siphons, and recontouring the streambanks. The CER Alternative
12 would also result in permanent impacts (i.e., discharge of dredged or fill material) on 0.7 acre of
13 riparian wetlands at Deer Creek from the footprint of the canal realignment. The new siphons for
14 the CER Alternative would be buried under the streams at Project completion, and the
15 streambeds would be restored. Placement of the new siphons would therefore not have a
16 permanent impact on the intermittent streams.

17 Appendix F, Section 7, Table 6 provides a summary of estimated temporary and permanent
18 impacts on aquatic resources. It shows that construction of the CER Alternative would have
19 potentially significant impacts on wetlands. With implementation of ECs/MMs BIO-3a through
20 BIO-3d, the appropriate permits will be acquired prior to construction, timing of in-water work
21 will be restricted to the dry season, and there would be no net loss of wetlands. Therefore, the
22 impacts would be **less than significant** with implementation of the ECs/MMs.

23 ***Impact BIO-4: Interfere substantially with the movement of any native resident or migratory***
24 ***fish or wildlife species or with established native resident or migratory wildlife corridors, or***
25 ***impede the use of native wildlife nursery sites.***

26 Construction of the CER Alternative would have temporary and permanent impacts on White
27 River, Deer Creek, and the FKC, all of which can be used by wildlife as migratory corridors, and
28 therefore could result in potentially significant impacts on the movement of native or resident
29 migratory species. With the implementation of ECs/MMs BIO-1a through BIO-11, the impacts
30 would be **less than significant**.

31 ***Impact BIO-5: Conflict with any local policies or ordinances protecting biological resources,***
32 ***such as a tree preservation policy or ordinance.***

33 The Tulare County General Plan – 2030 Update addresses biological resources in the
34 Environmental Resources Management (ERM) section. The goal of ERM-1 is to preserve and
35 protect sensitive habitats, enhance biodiversity, and promote healthy ecosystems throughout the
36 county. The Kern County General Plan addresses biological resources in the Resource Section,
37 Section 1.10.5 Threatened and Endangered Species. This section includes policies and
38 implementation measures to conserve threatened or endangered wildlife and plants.
39 Implementation of the CER Alternative without consideration of these policies would be a
40 potentially significant impact. ECs/MMs BIO-1a through BIO-11 would be implemented as part

1 of the CER Alternative and would minimize impacts on threatened and endangered species,
 2 therefore enabling the CER Alternative to be consistent with these plans and policies. This
 3 impact would therefore be **less than significant**.

4 **CE Alternative**

5 ***Impact BIO-1: Have a substantial adverse effect, either directly or through habitat***
 6 ***modifications, on any species identified as a candidate, sensitive, or special status species in***
 7 ***local or regional plans, policies, or regulations, or by CDFW, USFWS, or NMFS.***

8 The impacts associated with the CE Alternative would be slightly smaller in scale (i.e., would
 9 impact fewer acres of habitat) than those of the CER Alternative, but would impact the same
 10 special-status species and sensitive natural resources. For detailed acreage comparisons of
 11 impacts to terrestrial and aquatic habitat from the two alternatives, see Table 4-2. The CE
 12 Alternative would also result in temporary impacts on approximately 226 acres of annual
 13 grassland, temporary impacts on approximately 0.9 acre of Fremont cottonwood forest and 0.5
 14 acre of mulefat thicket, and permanent impacts on 0.9 acre of Fremont cottonwood forest and
 15 one acre of mulefat thickets.

16 The CE Alternative would take significantly longer to build than the CER Alternative, which
 17 would result in a longer duration of Project-related disturbance and activity. Consequently, the
 18 significance of Impact BIO-1 described for the CER Alternative would also apply to the CE
 19 Alternative and would be potentially significant. Implementation of EC/MM BIO-1a through -11
 20 would reduce impacts on special-status species to a **less-than-significant** level.

21 ***Impact BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive***
 22 ***natural community identified in local or regional plans, policies, or regulations or by CDFW***
 23 ***or USFWS.***

24 Similar to the impacts described under BIO-2 for the CER Alternative, the CE Alternative would
 25 have potentially significant impacts on sensitive natural communities. It would result in
 26 temporary impacts on approximately 0.9 acre and permanent impacts on approximately 0.9 acre
 27 of Fremont cottonwood forest habitat. With the implementation of ECs/MMs BIO-2a through
 28 BIO-2c, impacts on sensitive natural communities will be minimized, and impacts would be **less**
 29 **than significant**.

30 ***Impact BIO-3: Have a substantial adverse effect on state or federally protected wetlands***
 31 ***(including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling,***
 32 ***hydrological interruption, or other means.***

33 The CE Alternative would result in temporary impacts on 0.5 acre (490 linear feet) of
 34 intermittent stream channel and 0.98 acre of riparian wetlands at Deer Creek, and permanent
 35 impacts on 0.7 acre of riparian wetlands at Deer Creek; and temporary impacts on 0.5 acre (397
 36 linear feet) of intermittent stream channel and 0.03 acre of riparian wetlands at White River. The
 37 temporary impacts would occur as a result of construction equipment access,
 38 decommissioning/constructing siphons, and recontouring the streambanks. The permanent
 39 impacts on riparian wetlands at Deer Creek would result from the footprint of the canal
 40 enlargement. The impacts would be similar to those described under impact BIO-3 for the CER

1 Alternative. With implementation of ECs/MMs BIO-3a through BIO-3d, the appropriate permits
 2 will be acquired prior to construction, timing of in-water work will be restricted to the dry
 3 season, and there would be no net loss of wetlands. Therefore, the impacts would be **less than**
 4 **significant** with implementation of the ECs/MMs.

5 ***Impact BIO-4: Interfere substantially with the movement of any native resident or migratory***
 6 ***fish or wildlife species or with established native resident or migratory wildlife corridors, or***
 7 ***impede the use of native wildlife nursery sites.***

8 Construction of the CE Alternative would have temporary and permanent impacts on White
 9 River, Deer Creek, and the FKC, all of which can be used by wildlife as migratory corridors, and
 10 therefore could result in significant impacts on the movement of native or resident migratory
 11 species. With the implementation of ECs/MMs BIO-1a through BIO-11, the impacts would be
 12 **less than significant**.

13 ***Impact BIO-5: Conflict with any local policies or ordinances protecting biological resources,***
 14 ***such as a tree preservation policy or ordinance.***

15 The CE Alternative would have similar impacts on local policies as those described in impact
 16 BIO-5 for the CER Alternative and would be **less than significant**.

17 **Cultural Resources**

18 This section describes the methods used to assess impacts on historical resources and historic
 19 properties that may be affected by the Project Alternatives. The direct, indirect, and cumulative
 20 impacts on known and unknown archaeological and built environment resources that would
 21 result from implementing the Project Alternatives are evaluated, and mitigation measures are
 22 presented to reduce potential impacts. Eligible cultural resources and character-defining features
 23 are described in Table 4-3.

24 **Table 4-3. Eligible Cultural Resources and Character-Defining Features**

Historic Property/ Historical Resource	Criteria for Evaluation Eligibility	Character-Defining Features	Contributing Features/ Resources
Friant-Kern Canal	As contributor to CVP: Criterion A (NRHP); Criterion 1 (CRHR). Individually eligible: Criterion C (NRHP); Criterion 3 (CRHR)	Location and relationship to Friant Dam; size, shape, and dimensions of canal prism; canal lining material; and direction of water flow. Delano Regulating Reservoir and Dealno-Earlimart Irrigation District pumping stations connection to FKC	Check structures; siphons; wasteways; CVP signage; corrugated metal recording houses; canal lining/prism; operating bridges; some pumping stations; and turnouts
Big Creek East & West Transmission Line	Contributor to Big Creek Hydroelectric System Historic District (BCHSHD); Criteria A & C (NRHP); Criteria 1 & 3 (CRHR)	System alignment; original steel frame towers; and the operational integrity of the line as a transmission feature of the BCHSHD	Original steel frame towers

Historic Property/ Historical Resource	Criteria for Evaluation Eligibility	Character-Defining Features	Contributing Features/ Resources
Columbine Vineyard	Individually eligible: Criterion C (NRHP); Criterion 3 (CRHR)	Agrarian setting; simple/utilitarian architectural forms for buildings and structures	Warehouse/processing facility; residential structures; and support buildings
Poplar Ditch (segment)	Individually eligible: Criterion 1 (CRHR)	Earthen ditch, agrarian setting.	N/A
19315 Road 234, Strathmore, CA	Individually eligible: Criterion C (NRHP); Criterion 3 (CRHR)	Eligible for the purpose of the Project	N/A
23100 Avenue 208, Lindsay, CA	Individually eligible: Criterion C (NRHP); Criterion 3 (CRHR)	Eligible for the purpose of the Project	N/A

1 **Significance Criteria**

2 In addition to the above and in accordance with the CEQA Guidelines, impacts to cultural
3 resources would be significant if an alternative would:

- 4 • Cause a substantial adverse change in the significance of a historical resource pursuant to
5 Section 15064.5.
6 • Cause a substantial adverse change in the significance of an archaeological resource
7 pursuant to Section 15064.5.
8 • Disturb any human remains, including those interred outside of formal cemeteries.

9 **Environmental Consequences**

10 Impacts to historical resources and historic properties are determined relative to existing
11 conditions (for CEQA) and the No Action Alternative (for NEPA); however, as described below,
12 the No Action Alternative would be the same as existing conditions because the cultural
13 resources are not anticipated to experience substantive changes in the Project APE. Therefore,
14 the analysis compares the impacts of the Project Alternatives only to existing conditions.

15 **No Action Alternative**

16 Canal realignment and/or enlargement would not occur under the No Action Alternative. The
17 potential for impacts within the Project APE on cultural resources would not increase over
18 existing conditions. The FKC and its associated appurtenant features would continue to function
19 as a gravity-fed water conveyance system and maintenance activities would continue; therefore,
20 the effects would not be exacerbated under the No Action Alternative. Impacts from land
21 subsidence due to groundwater depletion and other erosional forces are projected to continue,
22 which may cause long-term effects to this historic property and would be potentially significant.

23 Under the No Action Alternative, there would be **no impact** on other historical resources in the
24 Project APE because any effects of continued operation of the FKC would not be changed under
25 the No Action Alternative.

26 **CER Alternative**

27 The CER Alternative would restore the FKC design capacity using two methods: 1) raising
28 portions of the existing embankments of the canal up to four feet in height at two locations
29 (between MP 88.2 and MP 95.7 and between MP 116.0 and 121.5) and 2) constructing an
30 approximately 20-mile-long realigned canal segment located between 25 feet and 200 feet east of

1 the existing canal from MP 95.7 to MP 116. Most of the existing canal adjacent to the new canal
 2 segment would be taken out of service; however, some sections of the existing canal wall would
 3 be used to support the new canal segment and other portions being preserved for delivery pools
 4 at pump station turnouts. Cultural resources impacted by the CER Alternative are described in
 5 Table 4-4.

6 **Table 4-4. Cultural Resources Impacted by CER Alternative**

Historic Property/ Historical Resource	Character-Defining Feature(s) or Contributing Feature(s) Affected	Permanent Impact(s)	Temporary Impact(s)	Adverse Effect on Resource
Friant-Kern Canal	Canal prism and lining; check structures; siphons; wasteways; CVP signage; setting and sense of place. Lake Woollomes and Avenue 56, Avenue 40, and County Line Road Pumping Stations of Delano-Earlimart Irrigation District.	Alterations to prism and lining; realignment and modification of 20 miles of existing canal and associated wasteways and CVP signs; 2 new check structures; 2 new siphons;; changes to setting, feeling, design, materials, workmanship, and association	Atmospheric & audible conditions during construction	Yes
Big Creek East & West Transmission Line	Original steel frame towers	Removal of six Standard Towers	Atmospheric & audible conditions during construction	No
Columbine Vineyard	Agrarian setting	None	None	No
Poplar Ditch (segment)	Earthen prism	None	Atmospheric & audible conditions during construction	No
19315 Road 234, Strathmore, CA	None	None	Atmospheric & audible conditions during construction	No
23100 Avenue 208, Lindsay, CA	None	None	Atmospheric & audible conditions during construction	No

7 ***Impact CUL-1: Cause a substantial adverse change in the significance of a historical resource***
 8 ***pursuant to Section 15064.5.***

9 The CER Alternative would raise about 13.3 miles of the existing FKC and would realign an
 10 approximately 20-mile-long canal segment east of the existing canal. The realigned canal would
 11 be designed to be compatible with the existing canal (e.g., comparable width and depth). Once
 12 the realigned canal is constructed, most of the existing canal in that location would be taken out
 13 of service. Construction of the CER Alternative would have a significant impact on the FKC,
 14 which is a historical resource. With the implementation of EC/MM CUL-1, the impacts would be
 15 reduced, but would remain **significant and unavoidable**.

16 In terms of Section 106 of the NHPA, both Project Alternatives will result in a finding of adverse
 17 effect to historic properties, specifically the FKC and its contributing features. The proposed

1 Project is subject to compliance under the *Programmatic Agreement between the Bureau of*
2 *Reclamation, Mid-Pacific Region, and the California State Historic Preservation Officer*
3 *Regarding the Modifications to the Friant-Kern Canal, Fresno, Tulare, and Kern Counties,*
4 *California (PA)* which was executed on February 6, 2017. As of March 2020, Reclamation is
5 pursuing an amendment to the PA as the scope of activities and number of potential consulting
6 parties has expanded since the original PA's execution.

7 The amended PA will be used to direct the continued Section 106 process for the Project beyond
8 the finalization of the EIS/R, including the implementation of both a Programmatic Historic
9 Properties Treatment Plan (HPTP) and individual (i.e., resource-specific) HPTP(s). The HPTP(s)
10 will provide detailed procedures for implementing actions prescribed by the PA and guide all
11 efforts related to the resolution of adverse effects to historic properties, including cumulative
12 effects. The resolution of adverse effects will be developed between all signatories of the
13 amended PA, including Reclamation, SHPO, and FWA.

14 ***Impact CUL-2: Cause a substantial adverse change in the significance of an archaeological***
15 ***resource pursuant to Section 15064.5.***

16 There are no known archaeological resources in the area that would be affected by the CER
17 Alternative, and it is not anticipated that excavation associated with this alternative would
18 uncover any buried archaeological resources (Stantec 2019; Meyer 2020). Regardless, there is a
19 possibility of the inadvertent discovery of an archaeological resource during construction,
20 particularly in areas of higher sensitivity (e.g., areas near streams and major water channels).
21 With the implementation of EC/MMs CUL-1 and CUL-2 potentially significant impacts on
22 archaeological resources would be reduced to a **less-than-significant** level.

23 ***Impact CUL-3: Disturb any human remains, including those interred outside of formal***
24 ***cemeteries.***

25 There are no known human remains that have been recovered in the area that would be affected
26 by the CER Alternative and a search of the Sacred Lands File maintained by the NAHC and
27 consultation with Native American tribes and individuals did not identify any areas of cultural
28 sensitivity in the area. Regardless, there is a possibility of the inadvertent discovery of human
29 remains during construction of the CER Alternative. With the implementation of EC/MMs CUL-
30 1 & CUL-3 potentially significant impacts related to the discovery of human remains would be
31 reduced to a **less-than-significant** level.

32 ***CE Alternative***

33 The CE Alternative would restore the FKC design capacity using two methods: 1) raising
34 portions of the existing embankments of the canal up to four feet in height at two locations
35 (between MP 88.2 to MP 95.7 and MP 116.0 to 121.5) and 2) enlarging the existing canal by
36 raising the lining up to 15 feet in height and widening the canal to a total width of 56-foot-wide
37 between MP 95.7 to MP 116. Approximately four miles of a new bypass canal would be
38 constructed east of the existing canal. Cultural resources impacted by the CE Alternative are
39 described in Table 4-5.

1 **Table 4-5. Cultural Resources Impacted by CE Alternative**

Historic Property/ Historical Resource	CDF(s) or Contributing Feature(s) Affected	Permanent Impact(s)	Temporary Impact(s)	Adverse Effect on Resource
Friant-Kern Canal	Canal prism & lining; check structures; siphons; wasteways; CVP signage; setting & sense of place	Alterations to prism & lining with associated wasteways and CVP signs; 2 new check structures; 2 new siphons;; changes to setting, feeling, and historical associations	Atmospheric & audible conditions during construction	Yes
Big Creek East & West Transmission Line	Original steel frame towers	Removal of six Standard Towers	Atmospheric & audible conditions during construction	No
Columbine Vineyard	Agrarian setting	None	None	No
Poplar Ditch (segment)	Earthen prism	None	Atmospheric & audible conditions during construction	No
19315 Road 234, Strathmore, CA	None	None	Atmospheric & audible conditions during construction	No
23100 Avenue 208, Lindsay, CA	None	None	Atmospheric & audible conditions during construction	No

2 ***Impact CUL-1: Cause a substantial adverse change in the significance of a historical resource***
3 ***pursuant to Section 15064.5.***

4 The impacts associated with the CE Alternative would be similar to the impacts described in
5 Impact CUL-1 for the CER Alternative; however, up to 23.3 miles of the FKC would be enlarged
6 (about 13.3 miles would be raised and about 16 miles would be widened and raised) and four
7 miles of a new bypass canal would be constructed east of the existing canal. With the
8 implementation of EC/MM CUL-1 and compliance pursuant to Section 106 of the NHPA as
9 described under Impact CUL-1 for the CER Alternative, the significant impacts from the CE
10 Alternative would be reduced by implementation of EC/MM CUL-1, however the impact would
11 remain **significant and unavoidable**.

12 ***Impact CUL-2: Cause a substantial adverse change in the significance of an archaeological***
13 ***resource pursuant to Section 15064.5.***

14 Impacts from the CE Alternative would be similar to those described under Impact CUL-2 for
15 the CER Alternative. With implementation of EC/MMs CUL-1 and CUL-2, potentially
16 significant impacts on archaeological resources would be reduced to a **less-than-significant**
17 level.

1 *Impact CUL-3: Disturb any human remains, including those interred outside of formal*
2 *cemeteries.*

3 Impacts from the CE Alternative would be similar to those described under Impact CUL-3 for
4 the CER Alternative. With implementation of EC/MMs CUL-1 and CUL-3, potentially
5 significant impacts on human remains would be reduced to a **less-than-significant** level.

6 **Geology and Soils**

7 **Significance Criteria**

8 The criteria described below were developed in accordance with the CEQA Guidelines to
9 determine the significance of potential impacts related to geology and soils. Impacts would be
10 significant if an alternative would:

- 11 • Potentially cause substantial direct or indirect adverse effects, including the risk of loss,
12 injury, or death involving:
 - 13 - Strong seismic ground shaking.
 - 14 - Seismic-related ground failure, including liquefaction.
- 15 • Result in substantial soil erosion or the loss of topsoil.
- 16 • Be located on strata or soil that is unstable or that would become unstable as a result of
17 the project, and potentially result in an on- or off-site landslide, lateral spreading,
18 subsidence, liquefaction, or collapse.
- 19 • Be located on expansive soil, creating substantial direct or indirect risks to life or
20 property.
- 21 • Directly or indirectly destroy a unique paleontological resource or site or unique geologic
22 feature.

23 **Environmental Consequences**

24 **No Action**

25 Under the No Action Alternative, no changes to the FKC facility would occur, and the FKC
26 would continue to operate under existing conditions, therefore there would not be an increased
27 risk of loss, injury, or death from seismic-related shaking or ground failure. Additionally, given
28 there would be no construction-related activities under the No Action Alternative,
29 paleontological resources that could occur within the Project Area would remain undisturbed.
30 However, under the No Action Alternative, reduced capacity in the FKC could lead to changes in
31 agricultural production, including land fallowing or conversion of agricultural lands to other
32 uses, which could result in erosion or the loss of topsoil and could cause **significant** impacts on
33 geology and soils.

1 **CER Alternative**

2 ***Impact GEO-1: Potentially cause substantial direct or indirect adverse effects, including the***
3 ***risk of loss, injury, or death, from strong seismic ground shaking or seismic-related ground***
4 ***failure, including liquefaction.***

5 The CER Alternative is located in a moderately active seismic area. The southern end of the
6 Project area is closer to known active faults than the northern end (Table 3-4). The closest known
7 active fault is the Great Valley 14 (Kettleman Hills) fault, which is about 40 miles away from the
8 southern part of the Project area. This fault has a maximum moment magnitude of 7.2 (USGS
9 2014). The risk of failure due to fault rupture is considered low because no active faults are
10 known to cross the Project area.

11 Project embankments would be constructed for the design seismic event, reducing the risk of
12 Project seismic deformation in areas where shallow groundwater is not present. In areas where
13 shallow groundwater may be present, the risk of failure due to a seismic-related event which
14 could be potentially significant would be reduced to **less than significant** with implementation
15 of site-specific geotechnical and engineering methods as required by EC/MM GEO-1.

16 Seismic-related liquefaction is not expected for most of the Project area due to the deep
17 groundwater table. However, localized areas with shallow groundwater (for example at stream
18 crossings) may be susceptible to soil liquefaction or other seismic-related ground failure. If these
19 hazards exist, implementation of the Project could result in a potentially significant impact.
20 Implementation of specific geotechnical and engineering methods to reduce risks from soil
21 liquefaction or other seismic-related ground failure as required by EC/MM GEO-1 would reduce
22 the impact to a **less-than-significant** level.

23 ***Impact GEO-2: Result in substantial soil erosion or the loss of topsoil.***

24 Construction of the CER Alternative would generally consist of raising the existing FKC in two
25 segments and realigning and reconstructing the FKC over about 20 miles east of the existing
26 FKC. Raising the embankment of the existing canal would be accomplished by increasing the
27 height of the earthen canal banks and extending the concrete lining. Construction would begin
28 with mass excavation of the realigned canal and associated features (e.g., road crossings and
29 check structures). Excavated material would be used for construction of the west bank of the
30 realigned canal.

31 Next, excavation of the realigned canal would take place to the bottom of the canal prism,
32 approximately 18 feet below ground surface. This excavated material would be used to construct
33 the east bank of the realigned canal. The realigned canal embankments would be compacted to
34 the final canal embankment grades. At completion of the earthwork, a canal lining machine
35 would travel down the new canal prism, lining the canal with final cast-in-place concrete lining.

36 Approximately 2.5 million cubic yards of borrow material would be used from one or more of
37 the three proposed borrow sites to construct the realigned canal. The realigned canal footprint
38 spans approximately 502 acres, and approximately 406 acres of the existing FKC would be left
39 in place. The unused remaining canal segment would be maintained under FWA's existing
40 OM&R agreement, with Reclamation, however if not properly managed, disturbed portions of

1 the unused segment of the FKC (i.e., areas that have been excavated for use as borrow material),
2 could transport sediment into agricultural drains or sensitive receiving waters and could result in
3 significant impacts related to soil erosion. Implementation of ECs/MMs GEO-2-1, GEO-2-2, and
4 GEO-2-3 would reduce the impact to a **less-than-significant** level.

5 Operation of the CER Alternative is not anticipated to contribute sediment from erosion to the
6 Project area or stream channels that intersect the Project area. The Project area is located on
7 fairly flat land in an arid/semi-arid region, which decreases the risk for erosion. The FKC would
8 be lined with concrete, reducing the potential for erosion on the interior side of the embankment.
9 The top and the outside slopes of the canal embankment would not be lined with concrete and
10 would therefore be susceptible to erosion, but Project design features, consisting of compacting
11 the tops and outside slopes of the embankment and planting vegetation would minimize the risk
12 of erosion and sediment transport. Impacts related to soil erosion during operation of the CER
13 Alternative, including OM&R, would be **less than significant**.

14 ***Impact GEO-3: Be located on strata or soil that is unstable or that would become unstable as a***
15 ***result of the project, and potentially result in on- or off-site landslide, lateral spreading,***
16 ***subsidence, liquefaction, or collapse.***

17 The Project area consists of relatively flat agricultural land, roadways, and the existing FKC.
18 Landslides in the Project area are unlikely due to the flatness of the landscape and relatively low
19 annual precipitation. The embankments would be designed to satisfy Reclamation seismic
20 deformation criteria, and during construction re-compaction would be applied to increase the soil
21 shear strength. By way of the design, the CER Alternative would reduce the probability of
22 embankment landslides, and the impact is **less than significant**.

23 Land subsidence has been well documented in the Project area as a result of groundwater over
24 pumping (National Aeronautics and Space Administration 2016). The CER Alternative would
25 not contribute to subsidence and is designed to accommodate anticipated future subsidence by
26 extending the height of the embankments and siphon headwalls. As a result, the CER Alternative
27 would not result in subsidence and have **no impact**.

28 Soil liquefaction and lateral spreading could occur in areas where shallow groundwater is present
29 which could result in a significant impact. Implementation of EC/MM GEO-1 would reduce the
30 impact to a **less-than-significant** level.

31 No evidence of collapsible soil has been identified in the Project area. Project impacts due to
32 collapsible soil are considered **less than significant**.

33 ***Impact GEO-4: Be located on expansive soil, creating substantial direct or indirect risks to life***
34 ***or property.***

35 Expansive soils are characterized by the ability to undergo significant volume change (shrink or
36 swell) as a result of variations in soil moisture content. Soil moisture content can change due to
37 many factors, including perched groundwater, irrigation, and rainfall.

38 Shallow groundwater was observed during the phase 3 geotechnical investigation that seemed to
39 coordinate with release of water from the FKC to Deer Creek. During the phase 1 geotechnical

1 investigation, leakage from the existing canal into the embankment appeared to be relatively
2 small. The result of the phase 3 investigation did not indicate the presence of potentially
3 expansive soils; therefore, the potential of the Project to be located on expansive soils is
4 considered **less than significant**.

5 ***Impact GEO-5: Directly or indirectly destroy a unique paleontological resource or site or***
6 ***unique geologic feature.***

7 The Project area historically supported dry land farming and is currently used as irrigated
8 agricultural land, resulting in a highly disturbed landscape. A paleontological study was not
9 conducted for the Project area because it is not a known fossil-bearing area. No paleontological
10 resources or sites or unique geologic features have previously been encountered in the Project
11 area based on a thorough review of the geological literature and map information (California
12 Geologic Survey). It cannot conclusively be demonstrated that no subsurface paleontological
13 resources are present; therefore, the CER Alternative could result in potentially significant
14 impacts if paleontological resources are encountered during Project excavation. Implementation
15 of EC/MM GEO-5 would reduce the impact to a **less-than-significant** level.

16 ***CE Alternative***

17 ***Impact GEO-1: Potentially cause substantial direct or indirect adverse effects, including the***
18 ***risk of loss, injury, or death, from strong seismic ground shaking or seismic-related ground***
19 ***failure, including liquefaction.***

20 Under the CE Alternative, the uncompacted fill in the existing FKC would be replaced with
21 engineered compacted fill. The risk of seismic deformation would be relatively low in areas
22 where shallow groundwater is not present, and the embankment would likely perform adequately
23 if subjected to the design seismic event. In areas where shallow groundwater may be present, the
24 risk of failure due to a seismic-related event would be **less than significant** with implementation
25 of site-specific geotechnical and engineering methods as required by EC GEO-1. Similar to the
26 CER Alternative, soil liquefaction and other seismic-related ground failures may be potentially
27 significant in localized areas with shallow groundwater, but implementation of EC/MM GEO-1
28 would reduce the impact to a **less-than-significant** level.

29 ***Impact GEO-2: Result in substantial soil erosion or the loss of topsoil.***

30 Construction of the CE Alternative would require excavation associated with raising the existing
31 canal embankments, and about 6-million cubic yards of borrow material that would be obtained
32 from one or more of the three identified borrow sites (see the “Borrow” section in Appendix B1).
33 Construction of the CE Alternative would require shutting down the FKC multiple times.
34 Construction would be scheduled around predetermined annual canal shutdowns in winter
35 (December through February), meaning that construction would take place during months of
36 higher precipitation. If not properly managed, erosion of excavated areas and stockpiled soils
37 could transport sediment into agricultural drains or sensitive receiving waters. Construction
38 under the CE Alternative could have a significant impact related to soil erosion. Implementation
39 of ECs/MMs GEO-2-1 and GEO-2-2 would reduce the impact to a **less-than-significant** level.
40 Implementation of the CE Alternative would result in approximately four miles of the existing

1 FKC to be taken out of active service with the exception of small segments that would be
2 retained for turnout delivery pools as described in Chapter 2 and Appendix B1. The portions of
3 the existing FKC taken out of active service will be maintained by Friant under the OM&R
4 agreement, however if not properly managed, disturbed portions of the existing FKC could result
5 in a significant impact related to soil erosion. Implementation of EC GEO-2-3 would reduce the
6 impact to **less than significant**.

7 Operation of the CE Alternative is anticipated to have a **less-than-significant** impact related to
8 soil erosion as it would be similar to the CER Alternative.

9 The loss of topsoil would be similar to the CER Alternative as described above in GEO-2 and
10 would be **less than significant**.

11 ***Impact GEO-3: Be located on strata or soil that is unstable or that would become unstable as a***
12 ***result of the project and potentially result in on- or off-site landslide, lateral spreading,***
13 ***subsidence, liquefaction, or collapse.***

14 Impacts associated with landslides, subsidence, lateral spreading or collapse during construction
15 and operation of the CE Alternative would be similar to impacts described in Impact GEO-3 for
16 the CER Alternative. Impacts would be **less than significant**.

17 Soil liquefaction and lateral spreading could occur in areas where shallow groundwater is present
18 which could result in a significant impact. Implementation of EC/MM GEO-1 would reduce the
19 impact to a **less-than-significant** level.

20 ***Impact GEO-4: Be located on expansive soil, as defined in Table 18 1 B of the Uniform***
21 ***Building Code, creating substantial direct or indirect risks to life or property.***

22 The potential of the CE Alternative to be located on expansive soils is similar to the CER
23 Alternative as described in Impact GEO-4 above. Impacts would be **less than significant**.

24 ***Impact GEO-5: Directly or indirectly destroy a unique paleontological resource or site or***
25 ***unique geologic feature.***

26 Similar to impacts described in GEO-5 for the CER Alternative, the CE Alternative could result
27 in significant impacts on paleontological resources should any be present. Implementation of
28 EC/MM GEO-5 would reduce the impact to a **less-than-significant** level.

29 **Greenhouse Gases/Climate Change**

30 **Significance Criteria**

31 The significance criteria described below were developed in accordance with the CEQA
32 Guidelines to determine the significance of potential impacts related to GHGs. Impacts would be
33 significant if implementing an alternative would:

- 34 • Generate GHG emissions, either directly or indirectly, that may have a significant impact
35 on the environment.

- 1 • Conflict with any applicable plan, policy, or regulation of an agency adopted for the
2 purpose of reducing the emissions of GHG.

3 The SJVAPCD has provided guidance for evaluating the significance of GHG emissions that is
4 intended to assist lead agencies in addressing GHG impacts for CEQA purposes, but the
5 determination of significant impacts is ultimately within the purview of the lead agency. The
6 SJVAPCD guidance on assessing significance relies on Best Performance Standards (BPS) and
7 demonstration of GHG reductions compared to business as usual conditions. BPS have not been
8 established for construction projects.

9 In 2009, the SJVAPCD developed GHG guidance for determining a project’s significance. The
10 SJVAPCD determined that projects would be considered to have a less-than-significant
11 cumulative impact on climate change if any of the following conditions are met:

- 12 • Comply with an approved GHG reduction plan;
- 13 • Implement BPSs; or
- 14 • Reduce operational GHG emissions by at least 29 percent over business-as-usual
15 conditions (demonstrated quantitatively).

16 There is no GHG reduction plan that would apply to the Project. The use of BPSs for land use
17 development and construction projects has not been finalized by the SJVAPCD, and the
18 adequacy of impact analysis that uses statewide reduction in GHG emissions over business-as-
19 usual conditions methodology has been questioned by the California Supreme Court (*Center for*
20 *Biological Diversity v. California Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 227
21 “*CBD*”).

22 Numerical bright-line thresholds identify the point at which additional analysis and mitigation of
23 project-related GHG emission impacts would be necessary. Some air resource districts, but not
24 SJVAPCD, have adopted bright-line thresholds that have been developed for commercial
25 projects, residential projects, and stationary sources. Commercial and residential bright-line
26 thresholds are typically based on a market capture rate or a gap analysis, which is tied back to
27 Assembly Bill 32 reduction targets (1990 levels by 2020). These bright-line thresholds reflect
28 local or regional land use conditions, particularly residential and commercial density and access
29 to transit. For example, the Bay Area Air Quality Management District’s bright-line threshold of
30 1,100 metric tons of carbon dioxide equivalent (MTCO_{2e}) captures land use conditions present in
31 the Bay Area at the time of analysis and does not necessarily reflect conditions in other areas of
32 the state that display varying land use patterns and density. The Sacramento Metropolitan Air
33 Quality Management District (SMAQMD) has also adopted a threshold of 1,100 MTCO_{2e} for
34 construction and operation of land use development projects, such as new residential and
35 commercial projects. A stationary source bright-line threshold of 10,000 MTCO_{2e} has been
36 adopted by multiple air districts and other agencies as part of the permitting process, and the
37 South Coast Air Quality Management District uses the same threshold when it is the lead agency.

38 No bright-line threshold has been formally adopted by SJVAPCD for use in the SJVAB. As
39 discussed in the SMAQMD Guide to Air Quality Assessment in Sacramento County, the
40 recommended thresholds were developed to ensure at least 90 percent of new GHG emissions
41 would be reviewed and assessed for mitigation, thereby contributing to GHG emissions
42 reduction goals set by Assembly Bill 32, Senate Bill (SB) 32, the Scoping Plan, and Executive

1 Orders (see Appendix C for descriptions of these regulations). The SJVAPCD has allowed the
2 use of SMAQMD CEQA modeling tools to be used in CEQA and Indirect Source Review
3 assessments. As such, the SMAQMD bright-line threshold may be considered a tool for
4 evaluating the significance of GHG emissions. Further, SMAQMD’s CEQA Guidance indicates
5 that Lead Agencies may choose to amortize construction emissions over the life of the project.

6 The California Association of Environmental Professionals Climate Change Committee has also
7 provided guidance for assessing GHG impacts in the post-2020 timeframe and post-Newhall
8 Ranch (*CBD v. Newhall*) environment in its “Final White Paper Beyond 2020 and Newhall: A
9 Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for
10 California”, published in October 2016. The AEP Climate Change Committee consists of leaders
11 of climate action planning practices from consulting firms and agencies that have led many of
12 the local GHG reduction planning efforts across California.

13 Direct GHG emission impacts will include both construction and operation activities. Because
14 impacts from construction activities occur over a relatively short-term period, they contribute a
15 relatively small portion of the overall lifetime Project GHG emissions. The construction period
16 represents only eight percent of the operational lifetime in the CER Alternative (four years of
17 construction compared to 50 year life of the Project). In addition, GHG emission reduction
18 measures for construction equipment are relatively limited. Therefore, a standard practice is to
19 amortize construction emissions over the anticipated lifetime of a project, so that GHG reduction
20 measures will address construction GHG emissions as part of the operational GHG reduction
21 strategies. In the case of the Project Alternatives, there is no anticipated increase in operational
22 activities, as such, there is no increase in operational GHG emissions, nonetheless, GHG
23 construction emissions are amortized to evaluate the lifetime impact of the Project.

24 For the purposes of this analysis, the Project-specific threshold is set at 1,100 MTCO₂e,
25 consistent with the SMAQMD threshold. The 1,100 MTCO₂e is used to determine the Project
26 Alternative’s potential to generate GHG emissions that may have a significant impact on the
27 environment or conflict with an applicable GHG plan, policy, or regulation. Total construction
28 emissions were amortized over 50 years (the life of the Project) and compared to the 1,100
29 MTCO₂e bright-line threshold to determine the alternative’s significance.

30 **Environmental Consequences**

31 **No Action**

32 Under the No Action Alternative, no construction would occur, and GHG emissions would be
33 similar to existing conditions. Maintenance activities would be similar to existing conditions or
34 would slightly increase over time due to aging infrastructure. There is a potential decrease in
35 localized GHG emission due to expected reductions in groundwater pumping as a result of
36 implementation of SGMA and/or changes in irrigated agriculture associated therewith, resulting
37 in additional fallowed land. On a conservative basis, no changes in GHG emissions were
38 assumed under the No Action Alternative.

1 **CER Alternative**

2 ***Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may***
3 ***have a significant impact on the environment.***

4 Appendix E provides detailed information on the assumptions that were used to develop the
5 emissions calculations for the CER Alternative. Construction of the CER Alternative would
6 result in short-term GHG emissions from construction vehicles and equipment. GHG emissions
7 from construction equipment exhaust, haul trucks, and construction worker commuting were
8 estimated using a spreadsheet consistent with CalEEMod calculation methods and are shown in
9 Table 4-6.

10 **Table 4-6. Estimated CER Alternative Greenhouse Gas Emissions**

Year	MTCO ₂ e/yr
2021	7,007
2022	8,765
2023	1,202
2024	555
Total	17,530
Total Amortized Over 50 years	351
SMAQMD Threshold	1,100
Any Year Exceed Threshold?	No

11 Key: MTCO₂e/yr = metric tons of carbon dioxide equivalent per year

12 As shown, construction emissions of the CER Alternative would result in a total of 17,530
13 MTCO₂e or a yearly total of 351 MTCO₂e when amortized over 50 years (i.e., the life span of
14 the Project), and would therefore not result in an exceedance of the project threshold. As
15 indicated in Impacts AQ-1 and AQ-2, Reclamation and FWA would implement ECs/MMs to
16 reduce emissions, which may have the co-benefit of reducing GHG emissions. Therefore, with
17 implementation of ECs/MMs, the amortized GHG emissions would not exceed the Project
18 threshold of 1,100 MTCO₂e and the CER Alternative would have a **less-than-significant** impact.

19 Operation of the CER Alternative would be consistent with current operations and would not
20 result in an increase in GHG emissions. Therefore, operational impacts would be **less than**
21 **significant**.

22 ***Impact GHG-2: Conflict with any applicable plan, policy, or regulation of an agency adopted***
23 ***for the purpose of reducing the emissions of greenhouse gases.***

24 On August 21, 2008, the SJVAPCD initiated its Climate Change Action Plan, which culminated
25 in the adoption of the SJVAPCD's Guidance for Valley Land-Use Agencies in Addressing GHG
26 Emission Impacts for New Projects under CEQA on December 17, 2009. The Guidance
27 document would be applicable to the CER Alternative; however, the SJVAPCD's Guidance

1 document does not address temporary construction emissions and the recommended
 2 methodologies and thresholds have been successfully legally challenged where similar
 3 methodologies and thresholds have been used (*Center for Biological Diversity v. California*
 4 *Department of Fish and Wildlife and Newhall Land and Farming* [2015] 224 Cal.App.4th 1105
 5 [CBD vs. CDFW]; also known as the “Newhall Ranch” case). The SJVAPCD is in the process of
 6 updating its guidance document, but no timeline for completion is available. Given that the
 7 SJVAPCD’s guidance does not address construction emissions and has not been updated to
 8 address the outdated methodology, there is no local available plan, policy, or regulation for the
 9 reduction of GHG emissions that would be applicable.

10 As a statewide plan, California’s 2017 Climate Change Scoping Plan adopted by CARB on
 11 December 14, 2017, would be applicable to the Project. The 2017 Climate Change Scoping Plan
 12 Update addresses SB 32 to achieve a 40 percent below 1990 statewide GHG emissions limit no
 13 later than 2030.

14 Many of the measures included in the 2017 Scoping Plan are being implemented on a State-wide
 15 level would not specifically apply to the Project; however, through the use of cleaner
 16 construction equipment, the CER Alternative would participate in generating fewer Short-Lived
 17 Climate Pollutants consistent with the State’s Short-Lived Climate Pollutant Reduction Strategy
 18 for black carbon. The construction employee and haul fleet would also be subject to cleaner fuels
 19 as regulations are implemented at the statewide level. The CER Alternative would not be
 20 inconsistent with any of the State’s strategies included in the 2017 Scoping Plan and as such
 21 would not conflict with this plan. The impact would be **less than significant**.

22 **CE Alternative**

23 ***Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may***
 24 ***have a significant impact on the environment.***

25 GHG emissions from construction of the CE Alternative would be greater than those described
 26 above in Impact GHG-1 for the CER Alternative. Table 4-7 shows the total anticipated
 27 construction-related GHG emissions for the CE Alternative.

28 **Table 4-7. Estimated CE Alternative Greenhouse Gas Emissions**

Year	MTCO ₂ e/yr
2021	2,969
2022	3,684
2023	2,777
2024	2,745
2025	2,709
2026	2,673
2027	2,637
2028	2,601

Year	MTCO ₂ e/yr
2029	3,293
2030	1,398
Total	27,286
Total Amortized Over 50 years	546
SMAQMD Threshold	1,100
Any Year Exceed Threshold?	No

1 As shown, construction emissions of the CE Alternative would result in a total of 27,286
2 MTCO₂e or a yearly total of 546 MTCO₂e when amortized over 50 years, so it would not result
3 in an exceedance of the Project threshold. Similar to the CER Alternative, Reclamation and
4 FWA would implement ECs/MMs that may have the co-benefit of reducing GHG emissions. The
5 CE Alternative would not exceed the thresholds, and impacts would be **less than significant**.

6 *Impact GHG-2: Conflict with any applicable plan, policy, or regulation of an agency adopted*
7 *for the purpose of reducing the emissions of greenhouse gases.*

8 Impacts for the CE Alternative would be the same as described under Impact GHG-2 for the
9 CER Alternative. The CE Alternative would not hinder California’s implementation of the above
10 measures and as such would not conflict with this plan. The impact would be **less than**
11 **significant**.

12 **Hazards and Hazardous Materials/Wildfire**

13 **Significance Criteria**

14 The criteria described below were developed in accordance with the CEQA Guidelines to
15 determine the significance of potential impacts in relation to hazards and hazardous materials
16 and wildfire. Impacts related to hazards and hazardous materials would be significant if the
17 alternative would:

- 18 • Create a significant hazard to the public or the environment through reasonably
19 foreseeable upset and accident conditions involving the release of hazardous materials
20 into the environment.
- 21 • Emit hazardous emissions or involve the handling of hazardous or acutely hazardous
22 materials, substances, or waste within one-quarter mile of an existing or proposed school.
- 23 • Impair implementation of or physically interfere with an adopted emergency response
24 plan or emergency evacuation plan.

25 Impacts related to wildfire would be significant if the alternative would:

- 26 • Substantially impair an adopted emergency response plan or emergency evacuation plan.

1 **Environmental Consequences**

2 **No Action**

3 Under the No Action Alternative canal realignment and/or enlargement would not occur, and the
4 FKC would continue to operate under existing conditions. Therefore, there would be no changes
5 related to hazards, hazardous materials, and wildfire.

6 **CER Alternative**

7 ***Impact HAZ-1: Create a significant hazard to the public or the environment through***
8 ***reasonably foreseeable upset and accident conditions involving the release of hazardous***
9 ***materials into the environment.***

10 Construction of the CER Alternative would require the use, transport, storage, and disposal of
11 hazardous materials. Construction would require the use of vehicles and other construction
12 equipment, which would use hazardous materials such as fuels, lubricants, and solvents. The use,
13 storage, handling, or disposal of hazardous materials during construction could result in
14 accidental releases of small quantities and could expose people and the environment to
15 hazardous materials. The use of hazardous substances would be subject to best management
16 practices (BMPs) as included in ECs/MMs HAZ-1-1 and GEO-2-1 for the prevention of
17 accidental spills.

18 Valley fever fungi are known to be present year-round in soils in the Project region. Soil
19 disturbance by activities such as excavation and the movement of equipment throughout
20 construction areas could release fungal spores into the air, thus exposing persons, particularly
21 higher risk populations, to these pathogenic fungi. However, the localized scale of construction
22 associated with the CER Alternative would result in the generation of far less dust than the
23 intensive, agricultural operations that routinely occur throughout the region. Although
24 construction of the CER Alternative would have the potential to generate local airborne dust
25 conditions (fugitive dust), compliance with SJVAPCD Regulation VIII will minimize these
26 temporary emissions (see impact discussion AQ-1).

27 As part of the CER Alternative, 21 existing bridges would be demolished (Table 1-2 in Appendix
28 B1). There is a potential for these bridges to have asbestos-containing components such as pipe
29 insulation, gaskets, tar sealants, and paint. In addition, lead-based paint may have been
30 historically used to maintain bridge railings and metal substructures. Construction debris and
31 waste materials would be handled, transported, and disposed of in accordance with state and
32 federal regulations, which will include submitting notification of demolition to the CARB and to
33 the EPA in accordance with the National Emission Standards for Hazardous Air Pollutants
34 Section 61.145[b]. Implementation of ECs/MMs HAZ-1-2 and HAZ-1-3 will be used to
35 minimize the potential for exposure to asbestos- and lead-containing materials, respectively.
36 Additionally, ADL may be present in the soils adjacent to Project area roads based on the age of
37 the roadway and the date of the ban of leaded motor vehicle fuel (i.e., 1996). Specifically,
38 EC/MM HAZ-1-3 will require the survey and testing of potential ADL prior to demolition of the
39 bridges and associated portions of the existing roadway.

1 Operation of the CER Alternative would require the use of petroleum products such as diesel,
2 gasoline, and lubricants in pumps and other localized equipment needed to maintain operation of
3 the FKC. Under this alternative, operation of the FKC would be nearly identical to existing
4 operations and would not present a public hazard.

5 The CER Alternative could result in a significant hazard to the public or the environment caused
6 by a release of hazardous materials during construction; however, with implementation of
7 ECs/MMs HAZ-1-1, HAZ-1-2, HAZ-1-3, and GEO-2-1, as well as compliance with SJVAPCD
8 Regulation VIII, impacts would be **less than significant**.

9 ***Impact HAZ-2: Result in hazardous materials emissions or handling of hazardous or acutely***
10 ***hazardous materials, substances, or waste within one-quarter mile of an existing or proposed***
11 ***school.***

12 Five schools—William R. Buckley Elementary School, Burton Middle School and Summit
13 Charter Academy in Porterville, Strathmore Elementary School and Strathmore Middle School in
14 Strathmore—are located within 0.25 mile of the existing FKC alignment near the Project area.
15 As described in Impact HAZ-1, although construction of the CER Alternative would involve the
16 use of hazardous substances such as fuels, lubricants, and solvents, their use would be subject to
17 BMPs as listed in EC/MM HAZ-1-1 for the prevention of accidental spill of pollutants.

18 There are no schools located within 0.25 mile of any structures to be removed. Construction
19 debris and waste materials may travel on roads within 0.25 mile of a school; however, as
20 described above in impact HAZ-1, all debris and waste materials would be handled, transported,
21 and disposed of in accordance with state and federal regulations. Although schools would not be
22 directly affected by Project-generated asbestos and hazardous waste materials, implementation of
23 EC/MM HAZ-1-2 will be used to minimize the potential for indirect impacts.

24 Operation of the CER Alternative would require the use of petroleum products such as diesel,
25 gasoline, and lubricants in pumps and other localized equipment needed to maintain operation of
26 the FKC. Under this alternative, operation of the FKC would be nearly identical to existing
27 operations and would not present a hazard to nearby schools.

28 The CER Alternative could result in a potentially significant impact from hazardous materials
29 emissions being released within 0.25 mile of an existing school; however, with implementation
30 of EC/MM HAZ-1-1 and HAZ-1-2, the impact would be **less than significant**.

31 ***Impact HAZ-3: Impair implementation of or physically interfere with an adopted emergency***
32 ***response plan or emergency evacuation plan.***

33 The Project alignment is bisected by a network of roads. Neither Tulare County nor Kern County
34 have adopted evacuation routes for areas affected by the Project. Emergency evacuation routes
35 are determined on a case-by-case basis by the location and the type of the emergency. During
36 Project construction, most area roads would remain open to through traffic. Temporary road
37 closures of up to approximately three months may be required for construction of some
38 replacement crossings over the FKC; however, SR 190 and County Road 192 at the Avenue 64
39 intersection would remain open to maintain east/west and north/south traffic circulation. An

1 expanded temporary construction easement area would be used to allow for the construction of a
2 temporary bypass road around the construction site.

3 As per EC/MM TRAN 1-2, temporary road closures and traffic controls will be coordinated with
4 the Kern and Tulare county transportation departments. Additionally, as per EC/MM TRAN-2,
5 local emergency response agencies will be notified of temporary road closures associated with
6 bridge/road crossings and informed of the associated detour routes to ensure suitable alternative
7 routes or potential traffic delays are identified prior to the start of construction. Project
8 construction is not anticipated to significantly affect implementation of, or physically interfere
9 with, an adopted emergency response plan or emergency evacuation plan because vehicular
10 access will be maintained during construction; therefore, the CER Alternative would have a **less-**
11 **than-significant** impact on any emergency response plan or emergency evacuation plan.

12 Operation of the CER Alternative would have no impact on any adopted emergency response
13 plans or evacuation routes. New bridge crossings and associated roadway improvements at road
14 crossings would allow for continued use of affected roads that meet modern safety standards.

15 ***Impact WILD-1: Substantially impair an adopted emergency wildfire response plan or***
16 ***emergency wildfire evacuation plan.***

17 Neither Tulare County nor Kern County have adopted emergency wildfire response plans or
18 evacuation routes for areas affected by the Project. Emergency evacuation routes are determined
19 on a case-by-case basis by the location and the type of the emergency. Construction and
20 operation impacts of the CER Alternative on wildland fire response capabilities by local fire
21 departments and agencies such as the California Department of Forestry and Fire Prevention
22 would be similar to those previously described under Impact HAZ-3. The CER Alternative
23 would have a **less-than-significant** impact on any emergency wildfire response or emergency
24 wildfire evacuation plan.

25 **CE Alternative**

26 ***Impact HAZ-1: Create a significant hazard to the public or the environment through***
27 ***reasonably foreseeable upset and accident conditions involving the release of hazardous***
28 ***materials into the environment.***

29 Similar construction equipment would be used for the CE Alternative, as well as borrow
30 locations and construction staging areas, as those for the CER Alternative, resulting in similar
31 impacts on hazards as described above under Impact HAZ-1 for the CER Alternative. The use of
32 hazardous substances would be subject to BMPs as included in ECs/MMs HAZ-1-1 and GEO-2-
33 1 for the prevention of accidental spills, EC/MM HAZ-1-3 for the handling of lead-painted
34 surfaces, and compliance with SJVAPCD Regulation VIII to minimize temporary fugitive dust
35 emissions.

36 The CE Alternative would impact the same bridge crossings as the CER Alternative. All new
37 road crossings would require demolition of the existing bridges, and all bridge debris would
38 undergo similar testing and handling as described above for the CER Alternative. With
39 implementation of EC HAZ-1-1, EC HAZ-1-2, and EC HAZ-1-3, impacts from the CE
40 Alternative would be **less than significant**.

1 The CER Alternative could result in a significant hazard to the public or the environment caused
2 by a release of hazardous materials during construction; however, with implementation of
3 ECs/MMs HAZ-1-1, HAZ-1-2, HAZ-1-3, and GEO-2-1, as well as compliance with SJVAPCD
4 Regulation VIII, impacts would be **less than significant**.

5 ***Impact HAZ-2: Result in hazardous materials emissions or handling of hazardous or acutely***
6 ***hazardous materials, substances, or waste within one-quarter mile of an existing or proposed***
7 ***school.***

8 Potential impacts for the CE Alternative from the handling of hazardous materials within 0.25
9 mile of an existing school would be the same as those described in Impact HAZ-2 for the CER
10 Alternative. The CE Alternative could result in hazardous materials emissions within 0.25 mile
11 of an existing school; however, with implementation of ECs/MMs HAZ-1-1 and HAZ-1-2, the
12 impact would be **less than significant**.

13 ***Impact HAZ-3: Impair implementation of or physically interfere with an adopted emergency***
14 ***response plan or emergency evacuation plan.***

15 Under the CE Alternative, impacts on an adopted emergency response plan would be the same as
16 described under HAZ-3 for the CER Alternative, and impacts would be **less than significant**.

17 ***Impact WILD-1: Substantially impair an adopted emergency wildfire response plan or***
18 ***emergency wildfire evacuation plan.***

19 Road closures would be similar to closures described under Impact HAZ-3 and Impact WILD-1
20 for the CER Alternative, and impacts on emergency response plans would be **less than**
21 **significant** under the CE Alternative.

22 **Hydrology and Water Quality**

23 **Significance Criteria**

24 The significance criteria described below were developed in accordance with the CEQA
25 Guidelines to determine the significance of potential impacts in relation to hydrology and water
26 quality. Impacts to hydrology and water quality would be significant if implementing an
27 alternative would:

- 28 • Violate any water quality standards or waste discharge requirements or otherwise
29 substantially degrade surface or ground water quality.
- 30 • Substantially decrease groundwater supplies or interfere substantially with groundwater
31 recharge such that the project may impede sustainable groundwater management of the
32 basin.
- 33 • Substantially alter the existing drainage pattern of the site or area, including through the
34 alteration of the course of a stream or river or through the addition of impervious
35 surfaces, in a manner which would result in substantial erosion or siltation on- or off-site.
- 36 • Conflict with or obstruct implementation of a water quality control plan or sustainable
37 groundwater management plan.

1 Water quality objectives established in the Basin Plan for the Tulare Lake Basin (Central Valley
 2 Water Board 2018) to protect the beneficial uses from the types of potential pollutants that could
 3 be generated by the Project are shown in Table 4-8.

4 **Table 4-8. Tulare Lake Basin Plan Parameters and Water Quality Objectives**

Parameter	Water Quality Objective
Chemical constituents	Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.
Oil and grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
Sediment	The suspended sediment load and suspended sediment discharge rate of waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Settleable material	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
Suspended material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Turbidity	Where natural turbidity is between zero and five Nephelometric Turbidity Units (NTUs), increases shall not exceed one NTU. Where natural turbidity is between five and 50 NTUs, increases shall not exceed 20 percent. Where natural turbidity is equal to or between 50 and 100 NTUs, increases shall not exceed 10 NTUs. Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

5 Note: There are other parameters and objectives listed in the Basin Plan (e.g., ammonia, bacteria, biostimulatory
 6 substances, color, dissolved oxygen, floating material, pH, pesticides, radioactivity, salinity, taste and odor,
 7 temperature, and toxicity); those listed in this table are the only ones applicable due to the nature and location of this
 8 Project.

9 **Environmental Consequences**

10 **No Action Alternative**

11 Under the No Action Alternative, no construction activities would occur; therefore, there would
 12 be **no impact** on water quality standards (Table 4-8) or drainage patterns.

13 However, under the No Action Alternative, groundwater management could be impacted. At the
 14 time that this EIS/R was prepared, all GSAs in and around the Project area have adopted GSPs,
 15 and nearly all will have submitted their GSPs to DWR. Under SGMA, DWR must review and
 16 approve GSPs within two years after submittal by the GSAs. While it is not possible to
 17 determine what sustainable management actions will be required and if they differ from the
 18 adopted GSPs, assumptions made for this analysis were based on review of the publicly available
 19 GSPs prepared by the GSAs listed in Chapter 3. To support GSP preparation by the respective
 20 GSAs, water budgets were developed for the Tule and Kern Subbasins to determine the
 21 sustainable yield (the amount of groundwater that can be withdrawn annually without causing
 22 undesirable results). The water budgets considered groundwater recharge, evapotranspiration,
 23 surface water flow, and FKC water deliveries. The water budgets acknowledged and quantified

1 changes to FKC water deliveries as a result of anticipated climate change and SJRRP
 2 implementation. However, neither water budget quantified reduced FKC deliveries due to
 3 subsidence, although it is acknowledged (Eastern Tule Groundwater Sustainability Agency
 4 2019). Subsidence-induced capacity loss results in reduced deliveries from the FKC that in turn
 5 reduce water available for groundwater recharge. Projections indicate that deliveries would be
 6 reduced 150,000 AF annually by 2040 with another 30,000 AF annually by 2070, as shown in
 7 Table 4-9. This logic is applied to the No Action Alternative assumptions.

8 Therefore, the No Action Alternative may substantially interfere with groundwater recharge such
 9 that it may impede sustainable groundwater management in the Tule and Kern Subbasins. This
 10 impact would be **significant and unavoidable**.

11 **Table 4-9. Simulated Long-Term Average Annual Deliveries Below FKC Capacity**
 12 **Constraints**

Delivery Capability ¹	2018	2040	2070
Continued Historical Delivery Capability ²	416,222 AF	392,249 AF	392,249
Subsidence-Limited Delivery Capability ³	389,174 AF	242,988AF	212,578
Delivery Capability Reduction Resulting From Subsidence	27,048 AF	149,261	179,671

13 Notes:

14 ¹ Results are from CalSim II Simulated deliveries to the Friant Contractors below the subsidized area.

15 ² Changes in the long-term average condition with no subsidence is due to SJRRP implementation.

16 ³ Changes in delivery include reduced FKC capacity due to subsidence.

17 **CER Alternative**

18 ***Impact HYDRO-1: Violate any water quality standards or waste discharge requirements or***
 19 ***otherwise substantially degrade surface or ground water quality.***

20 Impact GEO-2 describes the CER Alternative’s construction activities, material qualities, and
 21 potential for erosion. During the construction period, erosion caused by construction of the CER
 22 Alternative that reaches surface waters may cause adverse effects to one or more of the water
 23 quality objectives listed in Table 4-8. Therefore, there would be potentially significant impacts
 24 on water quality standards as defined by the Tulare Lake Basin Plan. Implementation of
 25 ECs/MMs GEO-2-1 through 2-4 would reduce the impact on sediment related parameters and
 26 EC/MM HAZ-1-1 would reduce the impact on chemical constituents and oil and grease to a **less-**
 27 **than-significant** level.

28 ***Impact HYDRO-2: Substantially decrease groundwater supplies or interfere substantially with***
 29 ***groundwater recharge such that the project may impede sustainable groundwater***
 30 ***management of the basin.***

31 For the Tule and Kern Subbasins, the CER Alternative would supply anticipated FKC water
 32 deliveries to Friant Division contractors within the GSAs. GSP water budgets were developed in
 33 anticipation of FKC historical delivery capability with SJRRP implementation. Water from the

1 FKC used by Friant Division contractors would enable them to reduce their reliance on
2 groundwater and recharge groundwater when additional capacity and/or supplies are available,
3 helping the GSAs achieve sustainable groundwater management. Thus, the CER Alternative
4 would have a **less-than-significant and potentially beneficial** impact related to sustainable
5 groundwater management when compared to both the No Action Alternative and the existing
6 condition.

7 ***Impact HYDRO-3: Substantially alter the existing drainage pattern of the site or area,***
8 ***including through the alteration of the course of a stream or river or through the addition of***
9 ***impervious surfaces, in a manner which would result in substantial erosion or siltation on- or***
10 ***off-site.***

11 At Deer Creek and White River, new check structures, wasteways, and siphons would be
12 constructed to replace the existing structures. These structures would be designed in a manner
13 that would not alter the existing drainage pattern of the channels. Construction would occur
14 during periods of low to no flow so as to not affect flood flows. The CER Alternative would
15 therefore have a **less-than-significant** impact related to flood flows.

16 As described in GEO-2, excavation, grading, and other surface-disturbing activities would occur
17 in the Deer Creek and White River channels. These activities could result in substantial erosion,
18 causing a potentially significant impact. Construction practices would minimize erosion and
19 siltation, as detailed in ECs/MMs GEO-2-1 through 2-4, reducing the impact to a **less-than-**
20 **significant** level.

21 The CER Alternative would not affect the rate or amount of surface runoff or create or contribute
22 to existing runoff in a manner that would exceed the capacity of existing or planned stormwater
23 drainage systems. Therefore, the CER Alternative would have **no impact** on the rate or amount
24 of surface runoff and **no impact** on the capacity of stormwater systems.

25 ***Impact HYDRO-4: Conflict with or obstruct implementation of a water quality control plan or***
26 ***a sustainable groundwater management plan.***

27 See the discussion for Impacts HYDRO-1 and HYDRO-2. Under the CER Alternative, there
28 would be a **less-than-significant** impact related to implementation of the Tulare Lake Basin
29 Plan, and the CER Alternative would not conflict with or obstruct implementation of the GSPs
30 for the Tule and Kern Subbasins.

31 **CE Alternative**

32 ***Impact HYDRO-1: Violate any water quality standards or waste discharge requirements or***
33 ***otherwise substantially degrade surface or ground water quality.***

34 The construction and operations impacts of the CE Alternative would be similar to those
35 described for the CER Alternative. Similar construction equipment would be used for the CE
36 Alternative, as well as borrow locations and construction staging areas, yet the CE Alternative
37 construction duration is much longer. In addition, the CE Alternative disturbs fewer acres when
38 compared to the CER Alternative. Despite the differences in construction time and acres of
39 disturbance, it is anticipated that the CE Alternative would result in similar impacts. Therefore,

1 there would be potentially significant impacts on water quality standards as defined by the Tulare
2 Lake Basin Plan. Implementation of ECs/MMs GEO-2-1 through 2-4 and HAZ-1-1 would
3 reduce the impact to a **less-than-significant** level.

4 ***Impact HYDRO-2: Substantially decrease groundwater supplies or interfere substantially with***
5 ***groundwater recharge such that the project may impede sustainable groundwater***
6 ***management of the basin.***

7 For the Tule and Kern Subbasins, the CE Alternative would supply anticipated FKC water
8 deliveries to Friant Division contractors within the GSAs. GSP water budgets were developed in
9 anticipation of FKC historical delivery capability with SJRRP implementation. Water from the
10 FKC used by the Friant Division contractors would enable them to reduce their reliance on
11 groundwater and recharge groundwater when additional supplies are available. This would help
12 the GSAs achieve sustainable groundwater management. Thus, the CE Alternative would have a
13 **less-than-significant and potentially beneficial** impact related to sustainable groundwater
14 management when compared to both the No Action Alternative and the existing conditions.

15 ***Impact HYDRO-3: Substantially alter the existing drainage pattern of the site or area,***
16 ***including through the alteration of the course of a stream or river or through the addition of***
17 ***impervious surfaces, in a manner which would result in substantial erosion or siltation on- or***
18 ***off-site.***

19 The same construction designs, activities, and procedues described for the CER Alternative
20 would also apply to the CE Alternative. Therefore, the CE Alternative would also have a **less**
21 **than-significant** impact related to erosion and siltation and flood flows and **no impact** on the
22 rate or amount of surface runoff and the capacity of stormwater systems.

23 ***Impact HYDRO-4: Conflict with or obstruct implementation of a water quality control plan.***

24 Impacts would be similar to those described under HYDRO-1 for the CER Alternative. Thus, the
25 CE Alternative would have a **less-than-significant** impact as it would not conflict with or
26 obstruct implementation of the Tulare Lake Basin Plan or obstruct implementation of the GSPs
27 for the Tule and Kern Subbasins.

28 **Land Use and Planning and Agricultural Resources**

29 **Significance Criteria**

30 The significance criteria described below were developed in accordance with the CEQA
31 Guidelines to determine the significance of potential impacts related to land use and planning.
32 Impacts to land use and planning would be significant if implementing an alternative would:

- 33 • Cause a significant environmental impact due to a conflict with any land use plan, policy,
34 or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

35 Impacts related to agricultural resources would be significant if the alternative would:

- 1 • Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance
2 (Farmland), as shown on the maps prepared pursuant to the FMMP of the California
3 Resources Agency, to non-agricultural use.
- 4 • Conflict with existing zoning for agricultural use or a Williamson Act contract.
- 5 • Involve other changes in the existing environment, which, due to their location or nature,
6 could result in conversion of Farmland to non-agricultural use or conversion of forest
7 land to non-forest use.

8 **Environmental Consequences**

9 ***No Action Alternative***

10 Under the No Action Alternative, there would be no direct changes to existing land uses but the
11 FKC would continue to operate under capacity-restricted conditions, which is expected to
12 worsen over time. Indirect changes in land use patterns that are dependent all or in part on the
13 FKC for water, such as agricultural production, could occur. Less available water due to capacity
14 constraints coupled with SGMA implementation could cause agricultural lands to be fallowed or
15 converted to other uses, ultimately resulting in less agricultural land being actively farmed.
16 Additionally, capacity restrictions would also limit the ability of water contractors to receive
17 water during periods of peak demand or peak flow. These conditions could cause prime farmland
18 to be converted to other uses, which would have **significant and unavoidable** indirect impacts
19 on agricultural resources.

20 ***CER Alternative***

21 ***Impact LAND-1: Cause a significant environmental impact due to a conflict with any land use***
22 ***plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental***
23 ***effect.***

24 Pursuant to Government Code Section 53091(e), the location or construction of facilities for the
25 production, generation, storage, treatment, or transmission of water by a special district are not
26 subject to the zoning ordinance of the county in which the Project would be located (Justia
27 2019). Although the Project would not be required to comply with either county's zoning
28 ordinance, it is important to recognize that the CER Alternative would generally be compatible
29 with agricultural land uses because of its intent to restore the capacity of the FKC and maintain
30 the water supply for FKC users. The CER Alternative would not conflict with existing land use
31 designations/zoning and would comply with the guidelines and policies set forth in the counties'
32 general plans and zoning ordinances. Because the FKC is a source of agricultural water in Tulare
33 County and Kern County, necessary conversions of adjacent lands to canal components would be
34 considered a consistent use of agricultural zones (Bock pers. comm. 2019). Anticipated impacts
35 on zoning designations for land within the footprint of the CER Alternative are summarized in
36 Table 4-10. The Tulare County Board of Supervisors defined allowable uses on contracted lands
37 in Resolution No. 89-1275, which established Uniform Rules for Agricultural Use. Resolutions
38 No. 89-1275 and No. 99-0620 established the construction of utilities, including water, as a
39 compatible use for lands under a Williamson Act contract. Therefore, changes in agricultural
40 land uses, including zoning conversions and the cancellation of Williamson Act contracts, would
41 not conflict with local land use laws, including local zoning ordinances and would therefore be
42 **less than significant.**

1 EC AG-2 will ensure that privately held Williamson Act contracts are amended to reflect
 2 changes in acreages brought about by land conversions for the CER Alternative (see Impact AG-
 3 2), and this impact would be **less than significant**.

4 ***Impact AG-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide***
 5 ***Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping***
 6 ***and Monitoring Program of the California Resources Agency, to non-agricultural use.***

7 Anticipated impacts on designated important farmlands and Williamson Act contract lands are
 8 shown in Table 4-10. The CER Alternative would temporarily remove about 230 acres of Prime
 9 Farmland, 23 acres of Unique Farmland, and 364 acres of Farmland of Statewide Importance
 10 from current land uses and would result in the permanent conversion of approximately 219 acres
 11 of Prime Farmland, 68 acres of Unique Farmland, and 209 acres of Farmland of Statewide
 12 Importance (Table 4-10). For the purposes of quantifying impacts on FMMP acreages, the
 13 existing canal—a feature mapped within the gross extent of important farmland, but obviously
 14 no longer used for active agricultural cultivation—was included in areas of no impacts. Areas of
 15 temporary impacts include the FKC ROW outside of the existing canal and areas on the west
 16 side of the proposed CER Alternative alignment that are not currently used for agricultural
 17 production (e.g., isolated, uncultivated land segments located between access roads and the
 18 existing canal ROW). Permanent impacts consist of the realigned canal and other areas where
 19 mapped land uses would be permanently changed by Project construction and operation.

20 The permanent conversion of about 513 acres of important farmland would affect less than
 21 0.0002 percent of the combined total important farmland, including grazing lands, in Tulare
 22 (1,298,053 acres) and Kern (2,729,321 acres) Counties (DOC 2016b, c). Improvements to the
 23 FKC would serve agricultural interests by ensuring adequate surface water availability for
 24 irrigation, processing, etc. Although the permanent conversion of Prime, Unique, and Farmland
 25 of Statewide Importance to a non-agricultural use would be minor in the context of the total
 26 amount of important farmlands in Tulare and Kern Counties, the permanent removal of
 27 important farmlands would be significant. EC/MM AG-1 would be implemented to preserve
 28 ongoing agricultural operations within the project area, reducing the conversion of additional
 29 agricultural lands; however, even with implementation of EC/MM AG-1 this impact would be
 30 **significant and unavoidable**.

31 **Table 4-10. Impacts by Project Alternative on Designated Important Farmland and**
 32 **Williamson Act Contract Lands**

Farmland Classification	CER Alternative Total Acreage Mapped	CER Alternative Temporary Impacts (acres)	CER Alternative Permanent Impacts (acres)	CER Alternative No Impact (acres)	CE Alternative Total Acreage Mapped	CE Alternative Temporary Impacts (acres)	CE Alternative Permanent Impacts (acres)	CE Alternative No Impact (acres)
Prime Farmland	913	230	219	464	687	166	141	341
Farmland of Statewide Importance	690	364	209	117	545	317	157	23
Unique Farmland	478	23	68	387	477	17	97	1

Chapter 4. Environmental Consequences/ Environmental Impacts

Farmland Classification	CER Alternative Total Acreage Mapped	CER Alternative Temporary Impacts (acres)	CER Alternative Permanent Impacts (acres)	CER Alternative No Impact (acres)	CE Alternative Total Acreage Mapped	CE Alternative Temporary Impacts (acres)	CE Alternative Permanent Impacts (acres)	CE Alternative No Impact (acres)
Farmland of Local Importance	355	308	17	30	356	305	21	3
Grazing Land	9	1	—	8	9	1	—	0
IMPORTANT FARMLAND TOTAL	2445	926	513	1,006	2,074	806	416	368
Other Land (not mapped as important farmland)	255	NA	NA	NA	243	NA	NA	NA
Williamson Act Lands	1,098	316	347	435	788	294	151	339
TOTAL MAPPED PROJECT AREA	2,696				2,317			

1 Source: Tulare County 2019, Kern County 2019a

2 ***Impact AG-2: Conflict with existing zoning for agricultural use or a Williamson Act contract.***

3 The CER Alternative would require land acquisition, primarily to accommodate a new ROW for
 4 the realigned canal. This would result in the permanent removal of approximately 521 acres of
 5 land zoned for agricultural uses from agricultural production, including approximately 347 acres
 6 of lands that are currently under Williamson Act contracts (Table 4-10). Impacts on Williamson
 7 Act contract lands would be minor considering that there is a total of approximately three million
 8 acres currently under these contracts in Tulare and Kern Counties combined.

9 Anticipated impacts on zoning designations for land within the footprint of the CER Alternative
 10 are summarized in Table 4-11. As described under impact LAND-1, the Tulare County Board of
 11 Supervisors defined allowable uses on contracted lands in Resolution No. 89-1275, which
 12 established Uniform Rules for Agricultural Use. Resolutions No. 89-1275 and No. 99-0620
 13 established the construction of utilities, including water, as a compatible use for lands under a
 14 Williamson Act contract. Therefore, changes in agricultural land uses, including zoning
 15 conversions and the cancellation of Williamson Act contracts, would not conflict with local land
 16 use laws, including local zoning ordinances and would be less than significant. Further,
 17 implementation of EC AG-2 will ensure that privately held Williamson Act contracts are
 18 amended to reflect changes in acreages brought about by land conversions. Impacts on zoning
 19 for agricultural use and Williamson Act contract lands would be **less than significant**.

1 **Table 4-11. Impacts by Project Alternative on Zoning Designations**

Zoning Designations	CER Alternative Total Acreage Mapped	CER Alternative Temporary Impacts (acres)	CER Alternative Permanent Impacts (acres)	CER Alternative No Impact (acres)	CE Alternative Total Acreage Mapped	CE Alternative Temporary Impacts (acres)	CE Alternative Permanent Impacts (acres)	CE Alternative No Impact (acres)
Agricultural/Rural /Conservation (AC) (Porterville)	129	113	15	1	127	112	12	3
Exclusive Agriculture (AE)	107	13	—	94	42	10	—	32
Exclusive Agriculture - 20 Acre Minimum (AE-20)	1,473	381	394	698	1,180	276	239	665
Exclusive Agriculture - 40 Acre Minimum (AE-40)	549	338	112	99	526	314	111	101
Rural Residential (R-A)	0.1	0.1	—	—	0.1	0.1	—	—
Right of Way (Miscellaneous [Z])	284	101	10	173	287	102	13	172
No Zoning Information Provided	153	63	2	88	156	64	10	82
ALL ZONING INVENTORIED	2,695	1009.1	533	1,153	2,317	878	385	1,054

2 Source: Porterville 2007; Tulare County 2019, Kern County 2019a

3 ***Impact AG-3: Involve other changes in the existing environment, which, due to their location***
 4 ***or nature, could result in conversion of farmland to non-agricultural use or conversion of***
 5 ***forest land to non-forest use.***

6 As discussed under Impact AG-1, some existing farmland would be converted both temporarily
 7 and permanently to non-agricultural use by the construction of the CER Alternative, including
 8 the construction of new road approaches at bridge crossings over FKC. The purpose of the
 9 Project is to allow for the continued delivery of water for agricultural uses, thereby promoting
 10 the continuation of farming on agricultural lands that might otherwise be fallowed due to lack of
 11 water. Implementation of the CER Alternative would not result in other changes to the existing
 12 environment outside of the CER Alternative footprint that would cause the conversion of
 13 farmland to non-agricultural use. This impact would be **less than significant**.

14 There are no forest lands in the study area; the CER Alternative would therefore have **no impact**
 15 on forest lands.

1 **CE Alternative**

2 ***Impact LAND-1: Cause a significant environmental impact due to a conflict with any land use***
 3 ***plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental***
 4 ***effect.***

5 As discussed above in Impact LAND-1 for the CER Alternative, the CE Alternative would be
 6 compatible with all relevant land use plans, policies, and regulations and impacts. EC AG-2 will
 7 ensure that privately held Williamson Act contracts are amended to reflect changes in acreages
 8 brought about by land conversions, and this impact would be **less than significant**.

9 ***Impact AG-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide***
 10 ***Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping***
 11 ***and Monitoring Program of the California Resources Agency, to non-agricultural use.***

12 Impacts resulting from the CE Alternative would be similar to those described for the CER
 13 Alternative. Approximately 416 acres of designated important farmland, including grazing land,
 14 would be permanently converted (Table 4-10). Construction of the CE Alternative would
 15 temporarily remove about 806 acres of important farmland from agricultural use to allow for
 16 activities such as contractor staging (Table 4-10). These impacts on agricultural lands would be
 17 considered unavoidable, and similar to the assessment of impacts discussed under Impact AG-1
 18 for the CER Alternative. EC/MM AG-1 would be implemented to preserve ongoing agricultural
 19 operations within the project area, reducing the conversion of additional agricultural lands;
 20 however, even with implementation of EC/MM AG-1 this impact would be **significant and**
 21 **unavoidable**.

22 ***Impact AG-2: Conflict with existing zoning for agricultural use or a Williamson Act contract.***

23 The CE Alternative would also require land acquisition. This would result in the permanent
 24 removal of approximately 362 acres of land from agricultural production (Table 4-11), including
 25 approximately 151 acres of lands that are currently under Williamson Act contracts (Table 4-10),
 26 which would also be **less than significant**. However, similar to the CER Alternative, the CE
 27 Alternative would implement EC AG-2 to ensure that privately held Williamson Act contracts
 28 are amended to reflect changes in acreages brought about by land conversions. Impacts on
 29 zoning for agricultural use and Williamson Act contract lands would be **less than significant**.

30 ***Impact AG-3: Involve other changes in the existing environment, which, due to their location***
 31 ***or nature, could result in conversion of farmland to non-agricultural use or conversion of***
 32 ***forest land to non-forest use.***

33 Similar to discussion AG-3 for the CER Alternative, implementation of the CE Alternative
 34 would not result in other changes to the existing environment outside of the CE Alternative
 35 footprint that would cause the conversion of farmland to non-agricultural use. This impact would
 36 be **less than significant**.

1 **Noise**

2 **Significance Criteria**

3 The significance criteria described below were developed in accordance with the CEQA
4 Guidelines to determine the significance of potential impacts related to noise and vibration.
5 Impacts would be significant if an alternative would:

- 6 • Generate a substantial temporary or permanent increase in ambient noise levels in the
7 vicinity of the project in excess of standards established in local general plans or noise
8 ordinances or applicable standards of other agencies.
- 9 • Generate excessive groundborne vibration or groundborne noise levels.

10 The Roadway Construction Noise Model (RCNM) was used to determine likely noise levels
11 from the construction equipment. The RCNM enables the calculation of construction noise levels
12 in more detail than manual methods while avoiding the need to collect extensive amounts of
13 Project-specific input data.

14 **Environmental Consequences**

15 **No Action Alternative**

16 Under the No Action Alternative, no construction activities would occur, and the FKC would
17 continue to operate under existing conditions. Thus, there would be no temporary or permanent
18 increase in ambient noise levels or in groundborne vibration levels.

19 **CER Alternative**

20 ***Impact NOI-1: Generate a substantial temporary or permanent increase in ambient noise***
21 ***levels in the vicinity of the proposed Project in excess of standards established in local general***
22 ***plans or noise ordinances or applicable standards of other agencies.***

23 Construction of the CER Alternative would involve temporary noise sources from construction
24 activities and movement of equipment throughout the three-year construction period. Typical
25 construction-related equipment would include compressors, graders, trenchers, tractors,
26 excavators, and work trucks. During construction, temporary increases in noise from
27 construction equipment and activities would contribute to the noise environment in the
28 immediate vicinity of the CER Alternative. It is expected that, given the type of equipment that
29 would be used to construct the CER Alternative, construction activities would generate
30 maximum noise levels of 94.4 dBA at a distance of 50 feet and 74.4 dBA at a distance of 100
31 feet (Table 4-12).

32 **Table 4-12. Construction Equipment Noise Levels from the RCNM Users guide**

Type of Equipment	Acoustical Usage Factor (%)	dBA at 50 feet (L _{max} , L _{eq})	dBA at 100 feet (L _{max} , L _{eq})	dBA at 500 feet (L _{max} , L _{eq})
Pickup trucks	40	75, 71	69, 65	55, 51
Concrete trucks	40	78.8, 74.8	72.8, 68.8	58.8, 54.8
Compactor	20	83.2, 76.2	77.2, 70.2	63.2, 56.2

Chapter 4. Environmental Consequences/ Environmental Impacts

Type of Equipment	Acoustical Usage Factor (%)	dBA at 50 feet (L _{max} , L _{eq})	dBA at 100 feet (L _{max} , L _{eq})	dBA at 500 feet (L _{max} , L _{eq})
Water truck ¹	40	76.5, 72.5	70.4, 66.5	56.5, 52.5
Excavator	40	80.7, 76.7	74.7, 70.7	60.7, 56.7
Dozer	40	81.7, 77.7	75.6, 71.7	61.7, 57.7
Scraper	40	83.6, 79.6	77.6, 73.6	63.6, 59.6
Dump truck	40	76.5, 72.5	70.4, 66.5	56.5, 52.5
Vibratory compactor	20	83.2, 76.2	77.2, 70.2	63.2, 56.2
Water pull ²	40	76.5, 72.5	70.4, 66.5	56.5, 52.5
Flatbed truck	40	74.3, 70.3	68.2, 64.3	54.3, 50.3
Grader	40	85, 81	79, 75	65, 61
Canal trimmer ³	40	85, 81	79, 75	65, 61
Paving train	50	77.2, 74.2	71.2, 68.2	57.2, 54.2
Concrete curing applicator	50	80.6, 77.6	74.6, 71.6	60.6, 57.6
Crane	16	80.6, 72.6	74.5, 66.6	60.6, 52.6
Boom truck ⁴	16	80.6, 72.6	74.5, 66.6	60.6, 52.6
Front-end loader	40	79.1, 75.1	73.1, 69.1	59.1, 55.1
Bulldozer ⁵	40	81.7, 77.7	75.6, 71.7	61.7, 57.7
Generator	50	80.6, 77.6	74.6, 71.6	60.6, 57.6
Dewatering pump	50	80.9, 77.9	74.9, 71.9	60.9, 57.9
Backhoe	40	77.6, 73.6	71.5, 67.6	57.6, 53.6
TOTAL⁶ L_{max} (L_{eq})	—	94.4, 88.4	88.3, 82.4	74.4, 68.6

1 Source: Federal Highway Administration 2019

2 Notes:

3 ¹ A dump truck was used in place of a water truck due to the lack of available inputs in the RCNM.

4 ² A dump truck was used in place of a water pull due to the lack of available inputs in the RCNM.

5 ³ A grader was used in place of a canal trimmer due to the lack of available inputs in the RCNM.

6 ⁴ A crane was used in place of a boom truck due to the lack of available inputs in the RCNM.

7 ⁵ A dozer was used in place of a bulldozer due to the lack of available inputs in the RCNM.

8 ⁶ Because decibels are logarithmic units, sound pressure levels cannot be added or subtracted through ordinary arithmetic (i.e. adding and subtracting). Therefore, the decibel units in this table were added using a logarithmic equation.

9 L_{eq} = equivalent noise level

10 L_{max} = maximum A-weighted noise level

13 Sensitive receptors located within 50 feet of construction activities for the CER Alternative could
14 be exposed to maximum noise levels of 94.4 dBA maximum A-weighted noise level (L_{max}).

15 Tulare and Kern Counties, as well as the City of Porterville, have established construction hours
16 in their noise policies and ordinances intended to allow short-term construction noise to occur at
17 levels that would not be acceptable for permanent noise sources.

1 The Kern County Municipal Code limits construction to the hours between 6:00 a.m. and 9:00
2 p.m. on weekdays when occurring within 1,000 feet of an occupied residential dwelling.
3 Although Tulare County does not have a noise ordinance, policy HS-8.18 of the Tulare County
4 General Plan limits construction noise to the hours between 7:00 a.m. and 7:00 p.m., Monday
5 through Saturday. The City of Porterville limits construction to the hours of 6:00 a.m. and 9:00
6 p.m. on weekdays. There are numerous residences and five schools that are located within 1,000
7 feet of the proposed construction activities within Tulare County and the City of Porterville.
8 Construction in these areas would generally occur between 7:00 a.m. and 7:00 p.m. and would be
9 in compliance with the Tulare County General Plan policy, the Kern County Municipal Code,
10 and the City of Porterville Municipal Code.

11 As shown in Table 4-12, construction noise levels would cause a temporary increase in ambient
12 noise levels in the vicinity of the CER Alternative. Even though much of the construction would
13 occur within Tulare and Kern Counties' approved construction hours, in some instances,
14 construction may occur outside of the approved construction hours (i.e., nighttime work). When
15 work outside of the approved hours is needed, the contractor would be required to obtain a
16 waiver or exemption from the applicable agency (e.g., Tulare County Building Department) as
17 described in EC NOI-1.

18 Additionally, because the CER Alternative would be a linear Project, construction noise would
19 not be concentrated at any one location for more than seven months (Deer Creek and White
20 River), and there are few sensitive receptors near these locations. In the portions of the CER
21 Alternative that would occur near higher densities of sensitive receptors (i.e., Strathmore or
22 Porterville), construction in any one location would only last for a few weeks' time. The
23 proposed concrete batch plant would operate for the duration of the three-year construction
24 period. There is only one sensitive receptor located approximately 0.9 mile west of the proposed
25 batch plant on Avenue 56; therefore, the CER Alternative would not result in prolonged noise
26 exposure by sensitive receptors from construction activities and there would be a **less-than-**
27 **significant** impact related to construction noise.

28 Operation of the CER Alternative would be similar to existing conditions and would not result in
29 permanent or long-term noise increases above existing ambient levels. Therefore, there would be
30 **no impacts** related to operational noise.

31 ***Impact NOI-2: Generation of excessive groundborne vibration or groundborne noise levels.***

32 Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-
33 wheeled trains, and traffic on rough roads. Construction vibration can be transient, random, or
34 continuous. Increases in groundborne vibration levels attributable to the CER Alternative would
35 be from construction-related activities (e.g., earthmoving operations such as grading, leveling,
36 trenching, etc.). Construction would require the use of various off-road equipment, such as
37 tractors, concrete mixers, graders, and haul trucks. The use of major groundborne vibration-
38 generating construction equipment, such as pile drivers, would not be required. Groundborne
39 vibration levels associated with equipment that would be used in construction of the CER
40 Alternative are summarized in Table 4-13.

1 **Table 4-13. Vibration Levels for Construction Equipment**

Type of Equipment	Peak Particle Velocity at 25 Feet (inches/second)	Peak Particle Velocity at 50 Feet (inches/second)
Large bulldozer	0.089	0.031
Loaded trucks	0.076	0.027
Small bulldozer	0.003	0.001
Vibratory compactor/roller	0.210	0.074

2 Source: Federal Transit Administration 2018.

3 As shown in Table 4-13, construction could have a maximum peak particle velocity ranging
4 from 0.003 to 0.210 peak particle velocity from use of the vibratory compactor/roller within 25
5 feet of a sensitive receptor. Where construction activities would occur within 25 feet from a
6 sensitive receptor (i.e., near Strathmore and the City of Porterville), vibration levels from
7 vibration-related construction equipment would fall below the distinctly perceptible range and
8 the structural damage thresholds for modern to fragile buildings, as defined by Caltrans (Table 3-
9 3 and Table 3-4 in Appendix H). Construction-related vibration would be short-term, temporary,
10 and intermittent along the length of the FKC. Therefore, the CER Alternative would have a **less-**
11 **than-significant** impact related to groundborne vibration levels.

12 Operations of the CER Alternative would be similar to existing conditions and would not result
13 in increases of groundborne vibration. Therefore, there would be **no impacts** related to
14 operational groundborne vibration.

15 ***CE Alternative***

16 ***Impact NOI-1: Generate a substantial temporary or permanent increase in ambient noise***
17 ***levels in the vicinity of the proposed Project in excess of standards established in local general***
18 ***plans or noise ordinances or applicable standards of other agencies.***

19 Noise and vibration effects from construction of the CE Alternative would be similar to those
20 described above in Impact NOI-1 for the CER Alternative, except temporary noise impacts
21 associated with construction of the CE Alternative would occur for a longer duration
22 (approximately 10 years of construction with intermittent shut down periods to accommodate for
23 the irrigation season). Since the type of construction equipment used for the CE Alternative
24 would be the same as as described under the CER Alternative (including the potential for work
25 outside of the approved construction hours), the temporary noise levels shown in Table 4-12
26 would be the same for the CE Alternative, and impacts would be **less than significant**.

27 Implementation of EC NOI-1 would further ensure that impacts related to noise from
28 construction activities of the CE Alternative would remain **less than significant** and would not
29 conflict with any noise ordinance or general plan policy.

1 ***Impact NOI-2: Generation of excessive groundborne vibration or groundborne noise levels.***

2 Construction-related vibration for the CE Alternative would be similar to impacts described for
3 the CER Alternative (Table 4-12). Vibration from equipment would be short-term, temporary,
4 and intermittent along the length of the FKC. Therefore, the CE Alternative would have a **less-**
5 **than-significant** impact related to groundborne vibration levels.

6 Operations of the CE Alternative would be similar to existing conditions and would not result in
7 increases of groundborne vibration. Therefore, there would be **no impacts** related to operational
8 groundborne vibration.

9 **Transportation**

10 **Significance Criteria**

11 Potential impacts to transportation and traffic systems and facilities could occur if Project actions
12 would:

- 13 • Conflict with a program plan, ordinance or policy addressing the circulation system,
14 including transit, roadway, bicycle and pedestrian facilities.
- 15 • Result in inadequate emergency access.
- 16 • Cause an increase in traffic that is substantial in relation to the existing traffic load and
17 capacity of the street system (i.e., result in a substantial increase in either the number of
18 vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections).¹³
- 19 • Exceed, either individually or cumulatively, a LOS standard established by the county
20 congestion management agency for designated roads or highways.

21 Both Tulare County and Kern County use a threshold of LOS D for the minimum acceptable
22 operation of its transportation facilities (Tulare County 2012, Kern County 2009). Facilities
23 under the jurisdiction of Caltrans include freeway segments, ramps, ramp terminals, and arterials.
24 Although Caltrans has not designated a LOS standard, Caltrans' Guide for the Preparation of
25 Traffic Impact Studies (December 2002) indicates attempts to maintain the LOS of a state
26 highway facility between the LOS C and D thresholds (Caltrans 2002).

27 For the purpose of this analysis, a target LOS threshold of D was used to determine the
28 significance of Project Alternative impacts on traffic and transportation. The Project Alternative
29 would be considered to have a significant impact on traffic and transportation capacity and LOS
30 if it would cause the operation of a transportation facility to worsen from LOS D or better to

¹³ In 2019, the CEQA Guidelines were updated, which included a revision to the suggested thresholds included in Appendix G for transportation analyses. Appendix G suggests that CEQA Guidelines section 15064.3 subdivision (b) be used to evaluate transportation impacts, specifically describing considerations for evaluating a project's impacts using vehicle miles travelled. After consulting with Tulare and Kern Counties, it was determined that each county is best equipped to continue assessing transportation impacts against Level of Service thresholds, not vehicle miles travelled; therefore, this analysis uses similar criteria that has been used by the counties in previous CEQA analyses.

1 LOS E or F, or to worsen conditions for facilities already operating at LOS E or F without the
2 Project.

3 All urbanized areas in California with a population of 50,000 or more are required to maintain a
4 Congestion Management Program (CMP). The Tulare County CMP goal is to reduce traffic
5 congestion and provide a mechanism for coordinating land use and development decisions. The
6 Tulare CMP does not define the LOS standard for intersections on the highway system but
7 mentions the need to operate at acceptable levels of service.

8 **Environmental Consequences**

9 The analyses of transportation- and traffic-related impacts are based on the construction and
10 operational characteristics of the Project Alternatives, including type, location, trip generation,
11 trip distribution, and duration of activities.

12 **Construction (Short-Term/Temporary).** Construction of either alternative would cause a
13 temporary increase in construction-related traffic and demand on roadway capacity and alternate
14 routes associated with the construction activities. Construction impacts have been evaluated for
15 traffic and transportation impacts using the following methodology and assumptions:

- 16 • Data collection (traffic counts) and development of construction trip generation estimates
17 for the alternatives (including worker and material and equipment delivery traffic to and
18 from the Project site).
- 19 • Identification of borrow pit locations and estimate of soil material (truck trips) that may
20 be transported on local roads.
- 21 • Calculation of roadway capacities and LOS under baseline conditions and with- Project
22 construction conditions.
- 23 • Assessment of potential roadway closures resulting from construction activities and
24 identification of alternate routes relative to emergency response time.

25 **Operations and Maintenance (Long-Term).** No discussion of methodology and assumptions is
26 needed for operations and maintenance of either alternative because once construction is
27 completed, trips to conduct OM&R activities would not substantially increase from existing
28 levels.

29 **Roadway Segment Analysis.** Highway Capacity Manual, Sixth Edition is a standard reference
30 published by the Transportation Research Board; it defines LOS as a qualitative measure of the
31 performance of an element of a transportation system. LOS characteristics for roadway segments
32 are presented in Table 4-14.

33 **Table 4-14. Roadway Level of Service Descriptions**

Level of Service	Traffic Flow Description
A	Minimal or no vehicle delay
B	Slight delay to vehicles
C	Moderate vehicle delays, traffic flow remains stable

Level of Service	Traffic Flow Description
D	More extensive delays at intersections
E	Long queues create lengthy delays
F	Severe delays and congestion

1 Source: Highway Capacity Manual, Sixth Edition

2 Table 4-15 provides LOS and Annual ADT volume thresholds for uninterrupted flow rural
 3 highways. Since Caltrans and the Counties of Tulare and Kern do not have established AADT
 4 volume thresholds for uninterrupted flow on rural highways, the volume thresholds noted here
 5 are based on the Florida Department of Transportation (2012), Table 3, Generalized Annual
 6 Average Daily Volumes for Florida’s Rural Undeveloped Area and Developed Areas with less
 7 than 5,000 population, a source commonly used by traffic engineers for analyses of this type.
 8 This is a modified Highway Capacity Manual based LOS table that was used in the analysis.

9 **Table 4-15. Roadway Level of Service for Uninterrupted Flow Highways**

Lanes	Median	A	B	C	D	E	F
2	Undivided	-	< 4,700	8,400	14,300	28,600	> 28,600
4	Divided	-	< 25,700	40,300	51,000	57,900	> 57,900
6	Divided	-	< 38,800	60,400	76,700	86,800	> 86,800

10 Source: Florida Department of Transportation 2012. Generalized Annual Average Daily Volumes for Florida’s Rural
 11 Undeveloped Area and Developed Areas with less than 5,000 Population.

12 **No Action Alternative**

13 Under the No Action Alternative, there would be no construction activities; therefore, there
 14 would be no resulting construction-related traffic that could affect existing and future traffic
 15 volumes. Maintenance activities would be similar to or would slightly increase over existing
 16 conditions due to aging infrastructure; however, they would not be expected to result in a
 17 significant increase in traffic on local roadways. Normal background growth due to increases in
 18 general population, jobs, and households as well as other unrelated developments would occur.
 19 The analysis is a comparison to the existing conditions, and since the No Action Alternative
 20 would not involve Project construction activities, the impact would be **less-than-significant**.

21 **CER Alternative**

22 The analysis of construction trip generation for the CER Alternative is based on the ADT during
 23 construction on a typical day. Trip generation during construction is based on the vehicle
 24 assumptions provided in Appendix I. Heavy-vehicle trips are converted to passenger car
 25 equivalents (PCEs) for this impact analysis.

26 The CER Alternative is expected to generate a total PCE volume of approximately 334 ADT
 27 when construction activities are at their peak. To present a conservative estimate of the potential
 28 impacts, the analysis assumes a maximum of 400 ADT during construction and considers the

1 worst-case scenario for the impacts of construction traffic on each road. Table 4-16 summarizes
 2 the results of the road segment analysis for the CER Alternative.

3 **Table 4-16. Existing Plus Construction Traffic Level of Service – CER Alternative**

Road Segment	Jurisdiction	Lanes	Road Type	ADT	LOS	ADT with CER Alternative	LOS
SR 65 – PM 23.186 – Junction SR 155	Kern	2	Two-lane rural highway	7,500	C	7,900	C
SR 65 – PM 14.073 – Avenue 112	Tulare	2	Two-lane rural highway	11,900	D	12,300	D
SR 65 – PM 18.163 – Junction SR 190	Tulare	4	Multi-lane rural highway	28,500	C	28,900	C
SR 155 – PM 3.469 – Zachary Avenue	Kern	2	Two-lane rural highway	2,600	B	3,000	B
SR 155 – PM 6.550 – Famoso Porterville Highway	Kern	2	Two-lane rural highway	1,600	B	2,000	B
SR 155 – PM 10.990 – Junction SR 65	Kern	2	Two-lane rural highway	450	B	850	B
SR 190 – PM 9.474 – Poplar/County Road 192	Tulare	2	Two-lane rural highway	6,100	C	6,500	C
SR 190 – PM 15.241 – Porterville, Junction SR 65	Tulare	2	Two-lane rural highway	10,600	D	11,000	D

4 ***Impact TRAN-1: Conflict with a program plan, ordinance, or policy addressing the circulation***
 5 ***system, including transit, roadway, bicycle, and pedestrian facilities.***

6 Construction vehicles associated with the CER Alternative would cause a temporary increase in
 7 traffic due to the additional number of vehicles on the roads; traffic levels would, however,
 8 remain within acceptable limits in the context of road capacities and LOS (Table 4-16). There is
 9 only a limited number of pedestrian and bicycle facilities in the Project area. The CER
 10 Alternative would therefore not cause a conflict with a program plan, ordinance, or policy related
 11 to the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

12 Some roads would require closure to accommodate construction activities. Temporary detour
 13 routes and, in some cases, temporary bypass roads would be established for affected roads. The
 14 goal of any plan and/or policy addressing the circulation system is to ensure that the community
 15 transportation and circulation needs are met, in other words, that safe and convenient travel is
 16 provided in a manner suitable for all users, including bicyclists, pedestrians, and transit users.
 17 Road closures associated with the CER Alternative would potentially conflict with county
 18 circulation programs plans, ordinances, or policies addressing the circulation system such as
 19 those described above by removing connectivity in areas with no reasonable existing alternative
 20 routes, resulting in a potentially significant impact. With the implementation of ECs/MMs
 21 TRAN-1-1 and TRAN-1-2; however, the impact of the CER Alternative would be reduced to a
 22 **less-than-significant** level.

1 ***Impact TRAN-2: Result in inadequate emergency access.***

2 During and after construction, roads would continue to operate at the same acceptable LOS, with
3 similar travel speeds and no capacity deficiencies. However, several bridges would require
4 alteration or replacement (Table 1-2 in Appendix B1); although detour routes would be
5 identified, road closures required for bridge alteration or replacement could last up to three
6 months. If required by Tulare County, Kern County, or Caltrans, temporary bypass roads will be
7 constructed as necessary around the construction site. The TCAG 2018 RTP (TCAG 2019b)
8 states that the response time goal for the Tulare County Fire Department is 14 minutes for rural
9 areas, which is consistent with National Fire Protection Association Standards.

10 Due to the increased travel time on detour routes and/or temporary bypass roads, an increase in
11 emergency vehicles' response time could occur, resulting in a potentially significant impact if
12 response time increases to unacceptable levels. With the implementation of EC/MM TRAN-2,
13 the impact would be reduced, however the impact would remain **significant and unavoidable**.

14 ***Impact TRAN-3: Cause an increase in traffic that is substantial in relation to the existing***
15 ***traffic load and capacity of the street system (i.e., result in a substantial increase in either the***
16 ***number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections).***

17 Although there would be an increase in traffic during construction, expected traffic levels would
18 still be within acceptable limits in the context of roadway capacities (Table 4-16). This impact
19 would be **less-than-significant**.

20 ***Impact TRAN-4: Exceed, either individually or cumulatively, a level of service standard***
21 ***established by the County congestion management agency for designated roads or highways.***

22 The Tulare County CMP network consists of mostly state freeways and highways within valley
23 portion of Tulare County. The segments of SR 65 and SR 190 in the Project area are part of the
24 CMP network (TCAG 2015). None of these road segments would experience an unacceptable
25 LOS due to construction (Table 4-16). The impact would therefore be **less-than-significant**.

26 ***CE Alternative***

27 The analysis of construction trip generation for the CE Alternative is based on the ADT during
28 construction on a typical day. Trip generation during construction is based on the vehicle
29 assumptions provided in Appendix I. Heavy-vehicle trips are converted to PCEs for this impact
30 analysis.

31 The CE Alternative is expected to generate a total PCE volume of approximately 208 ADT when
32 construction activities are at their peak. To present a conservative estimate of the potential
33 impacts, the analysis assumes a maximum of 250 ADT during construction of the CE Alternative
34 and considers the worst-case scenario for the impacts of construction traffic on each road
35 segment. Table 4-17 summarizes the results of the road segment analysis for the CE Alternative.

1 **Table 4-17. Existing Plus Construction Traffic Level of Service – CE Alternative**

Road Segment	Jurisdiction	Lanes	Road Type	ADT	LOS	ADT with CE Alt	LOS
SR 65 – PM 23.186 – Junction SR 155	Kern	2	Two-lane rural highway	7,500	C	7,750	C
SR 65 – PM 14.073 – Avenue 112	Tulare	2	Two-lane rural highway	11,900	D	12,150	D
SR 65 – PM 18.163 – Junction SR 190	Tulare	4	Multi-lane rural highway	28,500	C	28,750	C
SR 155 – PM 3.469 – Zachary Avenue	Kern	2	Two-lane rural highway	2,600	B	2,850	B
SR 155 – PM – 6.550 – Famoso Porterville Highway	Kern	2	Two-lane rural highway	1,600	B	1,850	B
SR 155 – PM 10.990 – Junction SR 65	Kern	2	Two-lane rural highway	450	B	700	B
SR 190 – PM 9.474 – Poplar/County Road 192	Tulare	2	Two-lane rural highway	6,100	C	6,350	C
SR 190 – PM 15.241 – Porterville, Junction SR 65	Tulare	2	Two-lane rural highway	10,600	D	10,850	D

2 ***Impact TRAN-1: Conflict with a program plan, ordinance or policy addressing the circulation***
3 ***system, including transit, roadway, bicycle and pedestrian facilities.***

4 Construction of the CE Alternative is expected to take approximately 10 years. Construction
5 traffic associated with the portion of the CE Alternative that would be raised and widened would
6 be temporary, lasting approximately three months (December through February) per year during
7 annual predetermined canal shutdowns for a total of eight years. Although an increase in traffic
8 during construction is anticipated, the traffic levels would still be within acceptable limits in the
9 context of roadway capacities and LOS (Table 4-17).

10 The impact of the CE Alternative related to program plans, ordinances, and policies is the same
11 as for the CER Alternative but would be spread out over a longer period of time (10 years of
12 construction instead of three). The length of closures of affected roads (Table 4-17) would be
13 similar to that of the CER Alternative (approximately three months), resulting in a potentially
14 significant impact on programs plans, ordinances, and policies addressing the circulation system.
15 With implementation of ECs/MMs TRAN-1-1 and TRAN-1-2, the impact would be reduced to a
16 **less-than-significant** level.

17 ***Impact TRAN-2: Result in inadequate emergency access.***

18 The impact on emergency access from the CE Alternative would the same as for the CER
19 Alternative. The CE Alternative would result in a potentially significant impact on emergency
20 access. With implementation of EC/MM TRAN-2, the impact would be reduced but would
21 remain **significant and unavoidable**.

1 ***Impact TRAN-3: Cause an increase in traffic that is substantial in relation to the existing***
2 ***traffic load and capacity of the street system (i.e., result in a substantial increase in either the***
3 ***number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections).***

4 The impact associated with the CE Alternative is the same as for the CER Alternative. There
5 would be a **less-than-significant** impact on existing traffic loads.

6 ***Impact TRAN-4: Exceed, either individually or cumulatively, a level of service standard***
7 ***established by the County congestion management agency for designated roads or highways.***

8 The impact related to the roadway circulation system LOS associated with the CE Alternative is
9 the same as for the CER Alternative. This impact would be **less-than-significant**.

10 **Tribal Cultural Resources**

11 **Significance Criteria**

12 The significance criteria described below were developed consistent with the CEQA Guidelines
13 to determine the significance of potential impacts in relation to TCRs. Impacts would be
14 significant if the alternative would:

- 15 • cause a substantial adverse change in the significance of a TCR, defined in Public
16 Resources Code section 21074 as either a site, feature, place, cultural landscape that is
17 geographically defined in terms of the size and scope of the landscape, sacred place, or
18 object with cultural value to a California Native American tribe, and that is:
 - 19 - listed or eligible for listing in the CRHR, or in a local register of historical
20 resources as defined in Public Resources Code section 5020.1(k), or
 - 21 - a resource determined by the lead agency, in its discretion and supported by
22 substantial evidence, to be significant pursuant to criteria set forth in subdivision
23 (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in
24 subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall
25 consider the significance of the resource to a California Native American tribe.

26 **Environmental Consequences**

27 **No Action Alternative**

28 Cultural resources investigations and Native American outreach that was conducted by
29 Reclamation and FWA did not identify any TCRs or TCPs within or near the current alignment
30 of the FKC and its appurtenant features or any evidence to suggest that they may be present along
31 the canal (Stantec 2019). Therefore, continued operation of the FKC under the No Action
32 Alternative would not affect any TCRs or TCPs.

1 **CER Alternative**

2 **Impact TRIBE-1: Cause a substantial adverse change in the significance of a tribal cultural**
3 **resource, defined in Public Resources Code section 21074.**

4 As noted above, no TCRs or TCPs were identified in or near the Project area; therefore, the CER
5 Alternative would not affect any TCRs or TCPs. There would be **no impact**.

6 **CE Alternative**

7 Impacts on TCRs or TCPs would be the same as Impact TRIBE-1 described for the CER
8 Alternative. There would be **no impact**.

9 **Utilities and Service Systems and Energy**

10 **Significance Criteria**

11 The significance criteria described below were developed consistent with the CEQA Guidelines
12 to determine the significance of potential impacts related to utilities and service systems and
13 energy use. Impacts related to utilities and service systems would be significant if an alternative
14 would:

- 15 • Require or result in the relocation or construction of new or expanded water, wastewater
16 treatment or storm water drainage, electric power, natural gas, or telecommunications
17 facilities, the construction or relocation of which could cause significant environmental
18 effects.

19 Impacts related to energy use would be significant if an alternative would:

- 20 • Result in wasteful, inefficient, or unnecessary consumption of energy resources during
21 project construction or operation.

22 **Environmental Consequences**

23 **No Action Alternative**

24 Under the No Action Alternative, neither Project Alternative would be constructed. There would
25 therefore be no construction-related impacts on utilities or service systems. However, if the FKC
26 continues to operate under its current capacity-restricted conditions, there would be even more
27 reduced capacity over time as a result of continued subsidence. Water supplies for long-term
28 contractors would also decrease as the SJRRP implements the SJR channel improvements that
29 allow for increased and, ultimately, full release of Restoration Flows. If the capacity of the FKC
30 is not increased, Friant Contractors would need to find water sources from other suppliers in
31 order to maintain existing crops, which may require the construction and operation of additional
32 water conveyance infrastructure as well as electric facilities to operate the infrastructure. New
33 water infrastructure would, in and of itself, result in construction and operational impacts on
34 these utilities, thus potentially causing significant environmental effects. Operation of these new
35 facilities would result in an increase in consumption of energy (electricity and fossil fuels), but
36 would not be expected to result in significant impacts on energy resources and the resulting
37 impact would be **less-than-significant**. Additionally, reduced conveyance capacity could result

1 in changes in land use patterns, including fallowing or conversion of agricultural lands to other
2 uses. Development could require expansions of existing utilities including water, wastewater,
3 electric power, natural gas and telecommunications facilities, which could have direct and
4 indirect environmental effects; however, these projects would be required to undergo
5 environmental review and approval prior to implementation and would not be expected to cause
6 significant impacts to utilities and service systems.

7 **CER Alternative**

8 ***Impact UT-1: Require or result in the relocation or construction of new or expanded water,***
9 ***wastewater treatment, or storm water drainage, electric power, natural gas, or***
10 ***telecommunications facilities, the construction or relocation of which could cause significant***
11 ***environmental effects.***

12 **Water**

13 Construction of the CER Alternative would involve the use of small amounts of water
14 throughout construction for dust suppression. It is anticipated that water needed during
15 construction would be taken from the FKC from willing sellers, which would limit the number of
16 truck trips required to haul water to the Project area. The amount of water that would be required
17 on an annual basis is negligible in comparison to the amount of water delivered annually on the
18 FKC, and the water capacity of the FKC would be sufficient to meet the water needs during
19 construction.

20 The Project would result in the permanent removal of up to seven groundwater wells.
21 Groundwater wells that would be abandoned are all used for irrigation and do not provide
22 domestic water to any residences or communities in the Project area. Additionally, the Project
23 would require the relocation of six pipeline overcrossings during construction. However, the
24 relocation of these pipelines would not expand capacity or otherwise increase potential impacts
25 of these facilities and therefore would have a less than significant impact on water facilities.
26 Therefore, the CER Alternative would result in a **less-than-significant impact** on the relocation
27 or construction of new or expanded water facilities.

28 **Wastewater**

29 Construction of the CER Alternative would involve minor wastewater generation from sources
30 such as construction trailers, concrete mixing, and placement and cleaning of trucks and other
31 equipment. All wastewater generated onsite would be collected and disposed of in accordance
32 with state and federal regulations and would cease once construction is complete. Therefore, no
33 local wastewater treatment or collection systems would be affected by construction of the CER
34 Alternative. Operation of the CER Alternative would not involve any wastewater generation or
35 treatment. Therefore, the Project would have a **less-than-significant impact** on wastewater
36 facilities during construction and **no impact** during Project operation.

37 **Surface Water Drainage**

38 The majority of the Project area traverses rural areas that do not have stormwater infrastructure.
39 The CER Alternative would require relocation of several existing canals, pipelines, and culverts
40 as well as overcrossings that convey irrigation flow, surface drainage, or runoff from adjacent
41 lands. The capacity and function of the culverts would not be expanded or substantially changed.

1 Replacement of infrastructure would occur in the Project's construction footprint and would not
2 result in additional environmental impacts beyond those analyzed in this document. Therefore,
3 the CER Alternative would have a **less-than-significant** impact on existing stormwater facilities.

4 ***Electric Power/Natural Gas/Telecommunications***

5 Construction of the Project would require the use of electricity and natural gas to operate
6 construction equipment, including construction trailers and the concrete batch plant.
7 Telecommunications facilities would be temporarily required for construction trailers. Electrical
8 power, natural gas, and telecommunications would come from local public utility providers, all
9 of which have sufficient supplies, and would not require expansion because construction would
10 not create a significant demand on these facilities. Once construction is complete, the need for
11 these services would cease, and any new facilities that were temporarily expanded to
12 accommodate construction would be removed. Additionally, the Project would continue to
13 convey water primarily by gravity and would not result in new or expanded use of electricity.

14 Approximately seven miles of existing overhead electrical power lines would require relocation
15 to accommodate the Project. Relocation of poles and electrical lines would be performed by the
16 utility owners; however, the anticipated footprint of these relocated facilities would be in the
17 same disturbance area as the existing FKC and the CER Alternative (within the ROW) and
18 would not result in additional environmental impacts beyond those that have already been
19 identified. The CER Alternative would have a **less-than-significant** direct and indirect impact on
20 electrical power, natural gas, and telecommunication facilities.

21 ***Impact EN-1: Result in a potentially significant environmental impact due to wasteful,***
22 ***inefficient, or unnecessary consumption of energy resources during project construction or***
23 ***operation.***

24 Construction of the Project would require the use of fuels (primarily gasoline and diesel) for
25 operation of construction equipment (e.g., dozers, excavators, and trenchers), construction
26 vehicles (e.g., dump and delivery trucks), and construction worker vehicles. Direct energy use
27 would also include the use of electricity required to power construction equipment (e.g., welding
28 machines and electric power tools). In addition, Project construction would result in indirect
29 energy use associated with the extraction, manufacturing, and transportation of raw materials
30 needed to make construction materials.

31 Although the precise amount of construction-related direct energy that would be consumed under
32 the CER Alternative is unknown, it is estimated that off-road construction equipment would
33 operate for a total of approximately 380,010 hours and would consume a total of approximately
34 5,719,378 gallons of diesel fuel. With regard to vehicle use during construction, workers'
35 personal vehicles would consume approximately 181,151 gallons of gasoline (assuming an
36 average fuel use of 26.2 miles per gallon) and heavy haul trucks would consume approximately
37 2,862,007 gallons of diesel fuel (assuming an average consumption rate of 6.1 miles per gallon).
38 (See Appendix E for vehicle and equipment assumptions and fuel use factors.) When averaged
39 over the two-year construction period, annual fuel use for off-road construction equipment would
40 be approximately 2,859,689 gallons of diesel fuel per year, construction workers' personal
41 vehicles would consume approximately 90,576 gallons of gasoline per year, and heavy haul
42 trucks would consume approximately 1,431,004 gallons of diesel fuel per year.

1 Although the gasoline and diesel fuel consumption requirements for the CER Alternative are
2 minimal when compared to the total amount of gasoline and diesel fuel used in Kern and Tulare
3 Counties, the consumption of these resources throughout construction activities could result in a
4 potentially significant impact due to wasteful or inefficient use of these resources. However,
5 implementation of EC/MM EN-1, Construction Equipment and Vehicle Efficiency Plan, would
6 require construction equipment and vehicles to be used efficiently.

7 Further, due to the high cost of fuel and with standard federal, state, and local policies and
8 regulations pertaining to construction equipment, impacts related to wasteful, inefficient, and
9 unnecessary use of energy resources would be further reduced because construction contractors
10 would purchase fuel from local suppliers and would conserve the use of their fuel supplies to
11 minimize costs. Therefore, construction of the CER Alternative would result in a **less-than-**
12 **significant** impact related to wasteful, inefficient, and unnecessary consumption of energy
13 resources.

14 **CE Alternative**

15 ***Impact UT-1: Require or result in the relocation or construction of new or expanded water,***
16 ***wastewater treatment, or storm water drainage, electric power, natural gas, or***
17 ***telecommunications facilities, the construction or relocation of which could cause significant***
18 ***environmental effects.***

19 Disturbance to existing infrastructure, including groundwater wells, surface water drainage, and
20 gas and telecommunications facilities, under the CE Alternative would be similar to the
21 disturbance under the CER Alternative. Given that construction of the CE Alternative would take
22 more than twice as long as for the CER Alternative, it is expected that electricity use needed to
23 power construction trailers and the concrete batch plant would be twice as great than under the
24 CER Alternative. Like for the CER Alternative, electricity to power construction trailers and the
25 batch plant would be provided by local sources and the need for this electricity would cease once
26 construction is complete; therefore, new or expanded electric facilities would not be required.
27 Similar to the CER Alternative, extensions and relocations of existing facilities would not alter
28 their size or capacity, with disturbance occurring within the construction footprint analyzed
29 throughout this document. The CE Alternative would therefore result in a **less-than-significant**
30 impact on water, stormwater, electric power, natural gas, and telecommunication facilities.

31 ***Impact EN-1: Result in potentially significant environmental impact due to wasteful,***
32 ***inefficient, or unnecessary consumption of energy resources during project construction or***
33 ***operation.***

34 The CE Alternative would have energy-related consumption impacts similar to the impact
35 described in Impact EN-1 for the CER Alternative. It is estimated that off-road construction
36 equipment would operate for a total of approximately 2,798,304 hours and would consume a
37 total of approximately 59,311,354 gallons of diesel fuel. With regard to vehicle use during
38 construction, workers' personal vehicles would consume approximately 2,191,030 gallons of
39 gasoline (assuming an average fuel use of 26.2 miles per gallon), and heavy haul trucks would
40 consume approximately 28,848,052 gallons of diesel fuel (assuming an average consumption
41 rate of 6.1 miles per gallon) (see Appendix E for vehicle and equipment assumptions and fuel

1 use factors). When averaged over the 10-year construction period, annual fuel use for off-road
2 construction equipment would be approximately 5,931,135 gallons of diesel fuel per year,
3 construction workers' personal vehicles would consume approximately 219,103 gallons of
4 gasoline per year, and heavy haul trucks would consume approximately 2,884,805 gallons of
5 diesel fuel per year. Although energy consumption would be greater under the CE Alternative
6 due to the extended work period resulting in potentially significant impacts, implementation of
7 EC/MM EN-1 would help reduce overall consumption, and the CE Alternative would have a
8 **less-than-significant** impact related to wasteful, inefficient, or unnecessary consumption of
9 energy.

1 Chapter 5. Cumulative Effects

2 This chapter analyzes the overall cumulative effects of the Project Alternatives taken together
3 with other past, present, and reasonably foreseeable probable future projects (or actions) as
4 required by NEPA implementing regulations (40 CFR, Section 1508.7) and the CEQA
5 Guidelines (14 CCR, Section 15130).

6 **Methods and Assumptions**

7 Although NEPA implementing regulations do not provide specific guidance on how to conduct a
8 cumulative impacts analysis, Reclamation identifies associated actions (past, present, or future)
9 that, when viewed with the proposed or alternative actions, may have significant cumulative
10 impacts. Cumulative impacts should not be speculative but should be based on known long-range
11 plans, regulations, or operating agreements.

12 The CEQA Guidelines identify two basic methods for establishing the cumulative environment
13 in which a project is to be considered: the use of a list of past, present, and probable future
14 projects (the “list approach”) or the use of adopted projections from a general plan, other
15 regional planning documents, or a certified EIR for such a planning document (the “plan
16 approach”). This evaluation of cumulative effects uses the list approach and considers the effects
17 of the Project Alternatives and how they may combine with the effects of other past, present, and
18 future projects or actions to create significant impacts on specific resources.

19 Reasonably foreseeable probable future actions are actions that are currently under construction,
20 approved for construction, or in the final stages of formal planning at the time of preparation of
21 an EIS/EIR. The reasonably foreseeable probable future actions considered in this cumulative
22 effects analysis are actions located within the Project area that have been identified as potentially
23 having an effect on resources that also may be affected by Project Alternatives. A full list of
24 projects and plans considered are shown in Table 5-1. Current and future projects were identified
25 using county, agency, and local websites and databases. All agencies and development projects
26 that could result in a cumulative impact were searched. These identified projects were then
27 screened for proximity to the Project area as well as type of project and possible impacts that
28 could have the potential to overlap with the Project.

1 Table 5-1. Cumulative Projects List

Name	Location	Description	Current or Future Project?
Water Projects			
San Joaquin River Restoration Program Short-Term Recapture and Recirculation of Restoration Flows Project	Delta Region, San Luis Reservoir Region, Friant Division Contractors	The short-term Recapture and Recirculation of Restoration Flows for recapture, recirculation, reuse, exchange, or transfer of Restoration Flows in the SJR.	Current
San Joaquin River Restoration Program Long-Term Recapture and Recirculation of Restoration Flows Project	Delta Region, San Luis Reservoir Region, Friant Division Contractors	The Long-term Recapture and Recirculation of Restoration Flows Project analyzes alternatives for recirculation, recapture, reuse, exchange, or transfer of Restoration Flows in the SJR.	Future
Friant Division Improvements	Friant Kern Canal, CA	Part III of the San Joaquin River Restoration Settlement Act, Section 10201, states that the Secretary of the Interior is authorized and directed to conduct feasibility studies on the following improvements and facilities in the Friant Division, Central Valley Project: Restoration of the capacity of the FKC Upper and Lower Reach and Madera Canal, and reverse flow pump-back facilities on the FKC.	Future
Financial Assistance for Local Projects	Friant Division of the CVP	Part III of the Settlement Act authorizes and directs the Secretary to conduct additional Water Management Goal actions, including a program to provide financial assistance to local agencies within the Central Valley Project for the purposes of designing and constructing ground water recharge or banking facilities that offset water supply impacts on Friant Contractors. To date, there are three projects that are underway including the Cordeniz Basin Ground Water Storage Project – Conjunctive Exchange Program, Porterville In-Lieu Project Service Areas 1&2, and Kimberlina Road Ground Water Recharge and Banking.	Current
Reach 2B and Mendota Pool Bypass	Fresno County, CA	The Mendota Pool Bypass and Reach 2B Project consists of a floodplain that will be capable of conveying at least 4,500 cfs from the Chowchilla Bypass Bifurcation Structure to below Mendota Dam, a method to bypass Restoration Flows around Mendota Pool, and a method to deliver water to Mendota Pool.	Current
Reach 4B and Eastside Bypass	Merced County, CA	Reach 4B of the SJR is a 32.5-mile stretch that begins at the Sand Slough Control Structure and extends to the confluence of the Eastside Bypass and SJR. Modifications to ensure fish passage and modifications in the Eastside and Mariposa bypass channels support anadromous fish migration.	Current

Name	Location	Description	Current or Future Project?
Delano-Earlimart Irrigation District: Turnipseed Basin Expansion Project	Tulare County, CA	The primary phase of this project includes construction of ponds/cells within the basin separated by levees for groundwater recharge. A network of monitoring wells may also be constructed, if needed, to supplement existing monitoring wells associated with the banking operations that currently exist in proximity to the project. The secondary phase of the project would entail construction of up to four recovery wells on the project site, intended to be used to recover water from the project site for use as District supplies. None of the recovered water would be returned to the FKC.	Current
Turnipseed Basin Phase IV Expansion project	Delano, CA	The Delano-Earlimart Irrigation District is in the process of acquiring a 160-acre parcel immediately south of the existing Turnipseed Basin to provide for sustainable management of surface and groundwater. This project is located in southwest Tulare County, northeast of the City of Delano. The project includes construction of basin perimeter berms to create ponds/cells within the basin separated by levees.	Current
Akin Water Company Water Supply Project	Porterville, CA	This project includes construction of a new well to serve the City of Porterville, construction of new distribution pipelines, abandonment of two new existing wells, and consolidation of the Akin Water Company into the City of Porterville water system. The proposed distribution pipelines will connect into the existing City of Porterville water system in various locations within the city limits of Porterville.	Current
Tule River Friant Kern Canal Water Bank	Tulare County, CA	This project involves construction on approximately 130 acres in an unincorporated area of Tulare County, California, approximately one mile west of the City of Porterville. The site is currently operated as a groundwater recharge basin. The project involves construction and operation of six water recovery wells, a turnout from the Woods Central Canal, a pump station, 0.5 mile of canal, one mile of pipeline, an overflow monitoring and alarm system, and 125 acres of permanent groundwater recharge basin to replace 90 acres of existing temporary basins. The purpose of the project is to bank water that is periodically available above current needs from the Friant Division of the CVP and from the Tule River, and to make that water available to lawful recipients during times when it is needed. The project does not entail any modifications to the FKC and does not include pump-in of recovered water into the FKC.	Current

Name	Location	Description	Current or Future Project?
Infrastructure Projects			
Teapot Dome Landfill Entrance	Teapot Dome Landfill, Porterville, CA	The Tulare County Solid Waste Department is advertising for bids to relocate the entrance to the Teapot Dome Landfill to replace the current driveway and truck scale, which overlie buried waste. The new entrance will be constructed off the landfill footprint and includes a paved driveway, a portable truck scale, and a modular scale-house building. This project is expected to extend the operating life of the Teapot Dome Landfill a few years while the Woodville Landfill is prepared to resume operation.	Current
Ave 174 (Linda Vista over Friant-Kern Canal Bridge Replacement)	Avenue 174, Tulare County, CA	The Tulare County Resource Management Agency in cooperation with Caltrans is proposing to replace the existing bridge with an approximately 99-foot-long by 35-foot-wide, multi-span precast concrete or steel girder bridge. Construction is anticipated to start in 2022 and will take approximately nine months to complete, during which time Ave 174 will be closed to through traffic.	Future
Tule River Parkway Phase III	Porterville, CA	<p>The Tule River Parkway Master Plan (January 30, 1992) was adopted by the City of Porterville and established a goal and implementation framework for an approximately 6.8-mile regional river park and habitat preserve along the Tule River.</p> <p>The Tule River Parkway Phase III project intends to implement a part of the Tule River Parkway Master Plan. This project focuses on the 1/2 mile portion of the parkway between Main and Plano Streets, where it would extend the existing Class I bicycle and pedestrian trail along the Tule River.</p>	Current
Development Projects			
Trooper Terrace	Porterville, CA	The Trooper Terrace is a tentative subdivision in the western portion of Porterville. The subdivision includes 17 parcels which would consist of single-family residential units.	Future
Amalene Estates	Porterville, CA	The Amalene Estates is a tentative subdivision in the western portion of Porterville. This subdivision includes 62 parcels that would consist of single-family residential units.	Future
Salazar Ranch	Porterville, CA	The Salazar Ranch is a tentative subdivision in the northern portion of Porterville. This subdivision includes 12 parcels that would consist of single-family residential units.	Future
Summit Estates II	Porterville, CA	The Summit Estates is a tentative subdivision in the southern portion of Porterville. This subdivision includes 192 parcels that would consist of single-family residential units.	Future

1 Sources: Tulare County 2019, City of Porterville 2017

1 **Cumulative Effects Analysis**

2 **Air Quality**

3 Air pollution is largely a cumulative impact because the attainment status of the region is a result
4 of past and present development. While a single project would not determine the region's
5 attainment status, it would add to any existing air quality issues and would have a significant
6 cumulative effect. Because the SJVAPCD's significance thresholds are intended to both attain
7 and maintain the CAAQS and NAAQS, they are sufficient to determine if a project's individual
8 air quality impacts would also be cumulatively considerable (SJVAPCD 2015).

9 Prior to mitigation, total construction-related NO_x would exceed the SJVAPCD's annual
10 significance threshold for both the CER Alternative and the CE Alternative. Without mitigation,
11 both alternatives could therefore result in a cumulatively considerable impact related to
12 exceedance of the SJVAPCD's thresholds for construction related NO_x. To reduce the potential
13 cumulative impacts, District Rule 9510 and Regulation VIII and ECs/MMs AQ-1 and AQ-2
14 would be implemented. Additionally, other projects identified that occur within the SJVAB
15 would be required to comply with the same regulations (District Rule 9510 and Regulation VIII),
16 which would reduce other projects' emissions. Under Project operations for either alternative,
17 there would not be an increase in emissions over the long term, and would therefore not
18 contribute to a long-term cumulatively considerable increase of criteria pollutants. With the
19 implementation of ECs/MMs AQ-1 and AQ-2, Project Alternatives would not individually cause
20 an exceedance of the SJAVPCD's thresholds and therefore would not contribute to a significant
21 cumulative air quality impact.

22 **Biological Resources**

23 Past programs and projects, including development and agricultural cultivation of lands
24 surrounding the Project area, have impacted biological resources. These past projects include,
25 but are not limited to, construction/expansion of irrigation systems, construction of flood
26 management systems, development of agricultural lands, construction of roads, expansion of
27 urban/suburban commercial and residential properties, and maintenance of and improvements to
28 the FKC. Similar reasonably foreseeable projects (e.g., maintenance/upgrading of the FKC,
29 agricultural expansion, groundwater recharge expansion, and urban/suburban expansion) may
30 impact biological resources in general.

31 Implementation of the Project Alternatives combined with other projects identified in the region
32 could result in impacts on vegetation and wildlife resources. Impacts could include removal or
33 degradation of sensitive habitats, including streams or wetlands, as well as disturbance, harm, or
34 killing of special-status species, including state- and federal-listed species. However, the impacts
35 caused by other projects in the region, combined with implementing the Project Alternatives,
36 would not result in a significant cumulative impact even if all of the projects were to be
37 constructed simultaneously because all projects would be required to comply with laws and
38 regulations (i.e., ESA) protecting and mitigating impacts on sensitive habitats, streams and
39 wetlands, and special-status species. In addition, the implementation of the Project Alternatives
40 includes numerous ECs/MMs (BIO-1 through BIO-3) that would avoid or reduce impacts on
41 biological resources and would therefore not be cumulatively considerable.

1 **Cultural Resources**

2 Past programs and projects have affected cultural resources in the Project area, including the
3 FKC. These past projects include, but are not limited to, construction/expansion of irrigation
4 systems, construction of flood management systems, development of agricultural lands,
5 construction of roads, expansion of urban/suburban commercial and residential properties, and
6 maintenance of and improvements to the FKC. Similar reasonably foreseeable projects
7 (e.g., maintenance/upgrading of the FKC, agricultural expansion, and urban/suburban expansion)
8 could affect cultural resources in general and historical resources (i.e., the FKC).

9 Implementation of either Project Alternative combined with other projects identified in the
10 region could result in a considerable impact on the FKC. The Project's contribution and the
11 contribution of other projects directly impacting the FKC affect the characteristics of the FKC
12 that make it eligible for the NRHP and CRHR and are cumulatively considerable. Although
13 implementation of EC/MMs CUL-1, CUL-2 and CUL-3 would reduce impacts on the FKC,
14 adverse effects would still occur. Even with implementation of ECs/MMs, the Project
15 Alternatives have the potential to be cumulatively considerable on the FKC.

16 **Geology and Soils**

17 Past, present, and reasonably foreseeable future projects include but are not limited to
18 construction/expansion of irrigation systems, construction of flood management systems,
19 development of agricultural lands, construction of roads, expansion of urban/suburban
20 commercial and residential properties, and maintenance of and improvements to the FKC, all of
21 which may it geology and soil resources due to localized soil erosion and sedimentation. All of
22 the listed projects would be subject to the same regulations that the Project Alternatives would be
23 subject to (e.g., Section 401 of the CWA). Although implementation of the Project Alternatives
24 could result in impacts on soil resources from localized erosion and sedimentation due to
25 construction, implementation of ECs/MMs GEO-2-1 through GEO-2-3 would reduce the
26 potential for increased soil erosion. Operation of the Project Alternatives is not anticipated to
27 contribute sediment from erosion, and therefore would not create a cumulatively considerable
28 impact on erosion and sedimentation.

29 Additionally, because the region is moderately seismically active, infrastructure projects would
30 be designed to withstand seismic forces. Therefore, implementing the Project Alternatives would
31 not result in a cumulatively considerable effect to geology and soils.

32 **Greenhouse Gases/Climate Change**

33 As presented in Chapter 4, the SMAQMD Guide to Air Quality Assessment in Sacramento
34 County states that if a project's emissions exceed the thresholds of significance, then the project
35 may have a cumulatively considerable contribution to a significant cumulative environmental
36 impact; however, if emissions are below that threshold, the Project would not be cumulatively
37 considerable. The Project Alternatives' emissions, amortized over the lifetime of the Project,
38 would not exceed the quantitative GHG emissions threshold; therefore, the incremental
39 contribution of either alternative's emissions would not be cumulatively considerable.

40 **Hazards and Hazardous Materials/Wildfire**

41 Construction of the Project would cumulatively contribute to the existing airborne particulates in
42 the region, particularly dust. Large construction projects and intensive large-scale agricultural

1 operations combined with topography create an environment where human health may be
2 adversely affected by dust. ECs/MMs that would control dust (ECs/MM GEO 2-1) would reduce
3 airborne dust, including the potential release of Valley fever fungal spores. Additionally, other
4 projects that occur within the SJVAB would be required to comply with the same regulations
5 (Regulation VIII) to reduce fugitive dust; therefore, Project Alternatives' impacts to hazards and
6 hazardous materials would not be cumulatively considerable during construction.

7 Coordination with affected counties and emergency response agencies during construction (as
8 required per ECs/MMs TRAN-1-2 and TRAN-2) will reduce the potential for the Project to
9 temporarily contribute cumulatively to evacuation delays or response capabilities in the event of
10 a regional emergency. The temporary effects of Project construction on emergency response or
11 evacuation capabilities would not be cumulatively considerable.

12 Neither Tulare County nor Kern County have adopted evacuation routes for areas affected by the
13 Project; therefore, Project Alternatives would not create a cumulatively considerable impact on
14 an adopted emergency response or evacuation plan.

15 **Hydrology and Water Quality**

16 Several of the reasonably foreseeable projects in the Project area are water projects intended to
17 restore the SJR, rehabilitate water infrastructure, or create groundwater recharge basins. As these
18 projects are envisioned, some would rely on water from the FKC that has been historically
19 available, but they would not result in physical disturbances or changes in flows in local
20 waterways (Tule River, Deer Creek, or White River) or to hydrologic features within the region
21 (SJR).

22 Several projects listed above in Table 5-1, like the Turnipseed Basin Phase IV Expansion project
23 are actions that are being taken in response to SGMA implementation. These projects, in
24 conjunction with the Project Alternatives, would not result in cumulative impacts on GSAs or
25 their ability to sustainably manage their respective groundwater basins; instead, the Project
26 Alternatives would have a beneficial impact on GSP implementation. Therefore, there would be
27 no cumulatively considerable impacts on hydrology and water quality.

28 **Land Use and Planning and Agricultural Resources**

29 The geographic area for this cumulative impact analysis is Tulare County and Kern County.
30 Agricultural land conversion is driven by development projects and planning processes in rural
31 areas where agricultural production is actively occurring, including county general plans that are
32 intended to guide future growth in both urban and agricultural areas. Other regional issues such
33 as drought, environmental restrictions, and economic recession have also affected agriculture in
34 the region. Some reasonably foreseeable projects and actions may affect agricultural production
35 (e.g., conversion of agricultural lands to non-agricultural lands) within the two counties. Land
36 conversions resulting from development projects would be considered on a project-by-project
37 basis because all projects would be required to undergo the appropriate planning review (e.g.,
38 Tulare or Kern Counties' planning departments) to evaluate their compatibility within the
39 context of established land uses within the region.

40 Removal of agricultural lands from production due to Project implementation under either
41 alternative would be unavoidable but minor in the context of the total amount of zoned

1 agricultural lands in the two counties. Although improvements to the FKC would serve
2 agricultural interests by ensuring adequate surface water availability for irrigation, processing
3 etc., and would therefore help preserve agricultural operations within the region, the permanent
4 loss of agricultural land associated with the Project Alternatives remains a significant and
5 unavoidable impact. The conversion of agricultural lands, including some lands under
6 Williamson Act contracts, to accommodate the Project (i.e., water conveyance) is considered by
7 the counties to be consistent with agricultural land uses and also consistent with their general
8 plans and zoning ordinances and would therefore not cumulatively impact the county's land use
9 or zoning plans. However, the permanent loss of agricultural lands resulting from the Project
10 Alternatives combined with other projects in the region that also convert agricultural lands to
11 non-agricultural uses would have a cumulatively considerable impact on agricultural resources.

12 **Noise**

13 Several related and reasonably foreseeable projects and actions may result in similar
14 construction-related noise impacts within the general vicinity of the Project area. However,
15 because noise impacts would be temporary and would have a less-than-significant impact, and
16 because other projects would be constructed under the same laws and policies related to noise
17 restrictions, there would not be a cumulatively considerable impact related to noise and
18 vibration.

19 **Transportation**

20 Several reasonably foreseeable projects and actions may result in short-term increases to local
21 traffic within the Project area due to construction activities, and there is the potential for
22 concurrent construction to occur; however, potential individual site impacts would be dispersed
23 due to timing, location, and distance. Some development projects that are anticipated to occur
24 may also result in a permanent increase of local traffic. Both Project Alternatives would
25 temporarily increase traffic volumes on local and regional roadways during construction;
26 however, once construction is complete, traffic volumes would return to pre-Project conditions.
27 Project-related impacts on emergency services due to road closures would be short-term and
28 would cease once construction of each road crossing is complete and the road is restored.
29 Additionally, as required under ECs/MMs TRAN-1-2 and TRAN-2, coordination with affected
30 counties and emergency response agencies during construction would reduce the potential for the
31 Project Alternatives to temporarily cumulatively affect response capabilities in the event of a
32 regional emergency.

33 Under Project operations for either alternative, there would not be an increase in operation-
34 related transportation requirements and therefore, neither alternative would result in a long-term
35 increase of traffic within the region or Project area. Therefore, there would be no cumulatively
36 considerable impacts related to transportation.

37 **Tribal Cultural Resources**

38 Cultural resources investigations did not identify any information indicating that past programs
39 or projects have affected TCPs and TCRs in the Project area. Therefore, none of the Project
40 Alternatives would result in a cumulatively considerable impact on any TCPs and TCRs.

1 **Utilities and Service Systems and Energy**

2 Several reasonably foreseeable projects, specifically the development project in the City of
3 Porterville, and actions considered in the cumulative impact analysis would include construction
4 that could also affect utilities, or could contribute to the demand for public utilities and services
5 in the Project area. The full impacts of future projects are not yet known; however, each project
6 is required to evaluate whether public services and utilities would be available and implement
7 mitigation to reduce significant effects. The Project Alternatives would not result in a new or
8 expanded demand on existing utilities but rather replacement of existing facilities affected by
9 construction. Infrastructure that requires removal or replacement to accommodate Project
10 Alternatives would occur within the construction footprint of the alternatives and would not
11 result in additional environmental impacts beyond those analyzed in this document. Additionally,
12 incorporation of the ECs/MMs listed in Chapter 2 and described in Appendix B2, would
13 minimize impacts on utilities, service systems, and energy would not be cumulatively
14 considerable.

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Chapter 6. Disclosures, Consultation and Coordination, and Other CEQA Considerations

NEPA requires consideration of the relationship of short-term uses and long-term productivity. NEPA and CEQA require consideration of irreversible and irretrievable commitments of resources, growth-inducing impacts, and significant and unavoidable impacts. These considerations are described in this chapter.

In addition, this chapter summarizes activities undertaken by Reclamation and FWA for public and agency involvement required for the Project. Appendix C provides a description of key policies and regulations that are applicable, either directly (e.g., requires a permitting action by a regulatory agency) or indirectly (e.g., requires that the Project is conducted in compliance with the law), that are applicable to the Project.

Relationship between Short-Term Uses and Long-Term Productivity

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

Construction activities for the Project Alternatives would require short-term uses of capital, labor, fuels, and construction materials. Construction would encroach into wildlife habitats and agricultural areas. General commitments of some construction materials are not considered “short-term uses” because they are largely irreversible (see below). Construction would result in temporary construction-related effects such as interference with agricultural productivity, local traffic and circulation, increased air emissions, and increased ambient noise levels; these effects, however, are not expected to alter the long-term productivity of the natural environment.

In the short term, implementing the Project Alternatives would directly increase demand for construction and technical services. The additional economic activity in these sectors could create jobs for construction contractors and workers and technical professionals such as environmental, engineering, and geological consultants. It would also indirectly temporarily increase economic activity in industries that provide construction materials and industries providing goods and services to workers for the duration of construction.

Project Alternative implementation would result in other short-term effects such as reduction in agricultural productivity due to the short-term uses of farmlands for construction staging and access, and short-term impacts on habitat that may be used by wildlife in the Project area.

1 Implementation of the Project Alternatives would result in increased water conveyance capacity
2 in the FKC, which would result in the continued long-term productivity of Friant Contractors. No
3 identified effects would pose a long-term risk to human health and safety. Implementing the
4 Project Alternatives, including implementation of ECs/MMs as described in Chapter 2 and
5 Appendix B2 of this EIS/R, would result in short-term increases to regional economic activity
6 and short-term construction-related effects that would decrease over time. However, the benefits
7 of improved conveyance capacity in the FKC would contribute to the long-term productivity of
8 agriculture within the region.

9 **Irreversible and Irretrievable Commitments of Resources**

10 NEPA requires that an EIS include a discussion of the irreversible and irretrievable commitments
11 of resources that may be involved should an action be implemented. Similarly, the CEQA
12 Guidelines (Section 15126, subdivision (c)) require that an EIR include a discussion of the
13 significant irreversible environmental changes that would be caused by a proposed project should
14 it be implemented.

15 An irreversible and irretrievable commitment of resources is the permanent loss of resources for
16 future or alternative purposes. Irreversible and irretrievable resources are those that cannot be
17 recovered or recycled, or those that are not consumed or reduced to unrecoverable forms. The
18 Project Alternatives would result in irreversible and irretrievable commitments of construction
19 materials, fuels, and land associated with wildlife and agricultural resources.

20 Both Project Alternatives would commit material resources such as aggregate and steel to
21 construct new or modified facilities. The most substantial amount of material resources would be
22 fill material (borrow) and concrete. It is expected that all the fill material would be sourced from
23 onsite excavations, including sites that have been identified near the Project area. Concrete
24 needed to line the canal would be sourced from local suppliers and would result in a permanent
25 loss of this resource for the future use. The Project Alternatives would commit only a small
26 quantity of these material resources relative to projected residential, commercial, industrial, and
27 institutional development. Therefore, the commitment of these material resources would not
28 result in a permanent loss of this resource for the future or alternative purposes.

29 Implementing Project Alternative activities would commit nonrenewable energy in the form of
30 electricity, gasoline, diesel fuel, and oil for equipment and vehicles used for the construction,
31 operation, and maintenance of the Project Alternative. Although the use of nonrenewable energy
32 would be an unavoidable effect, the Project Alternatives would use equipment and vehicles that
33 meet current energy efficiency standards and that would be routinely maintained to ensure a
34 minimal practicable effect on nonrenewable energy. Therefore, the Project Alternatives would
35 not result in substantial irreversible or irretrievable commitments of nonrenewable energy
36 resources.

37 Both Project Alternatives would require the temporary removal of wildlife habitat and the
38 temporary and permanent removal of agricultural lands. Wildlife habitat would be temporarily
39 disturbed during construction, but would not be permanently removed since the habitat would re-
40 establish once construction is complete. Farmland would be temporarily converted to non-
41 agricultural uses during construction to accommodate staging activities, and some farmland

1 would be permanently converted to non-agricultural uses to accommodate the Project
2 Alternatives. The Project Alternatives would thus result in a irreversible and irretrievable
3 commitment of agricultural land.

4 **Growth-Inducing Impacts**

5 NEPA requires that an EIS consider the indirect effects of a project resulting from growth
6 inducement. The CEQA Guidelines require that an EIR discuss how a project may induce growth
7 (CCR Title 14, Section 15126.2, subdivision (d)). A project will have a growth-inducing impact
8 if it directly or indirectly (1) removes obstacles to population or economic growth; (2) requires
9 the construction of additional community service facilities that could cause significant
10 environmental effects; or (3) encourages and facilitates other activities that would significantly
11 affect the environment, either individually or cumulatively.

12 The Project Alternatives would require construction labor to perform the necessary construction
13 work; however, any employment required for construction would be temporary. It is expected
14 that a large portion of the workforce would commute to the sites from the surrounding local
15 communities (e.g., Bakersfield) or find temporary accommodations for the duration of
16 construction and would not substantially induce growth in the Project area. Additionally,
17 although the Project Alternatives would increase the conveyance capacity of the FKC, there
18 would not be an increase in, or new allotment of, water for Friant Contractors.

19 **Significant Unavoidable Impacts**

20 Section 21100, subdivision (b)(2)(A) of CEQA provides that an EIR will include a detailed
21 statement setting forth “any significant effect on the environment that cannot be avoided if the
22 project is implemented.” Chapter 4 provides a detailed analysis of all potentially significant
23 environmental impacts. ECs/MMs will reduce or avoid the majority of the significant impacts.
24 However, it is expected that implementation of the Project Alternatives will have a significant
25 unavoidable impact on cultural resources due to impacts on the FKC, agricultural resources due
26 to the permanent conversion of important farmland, and transportation impacts due to a potential
27 increase in emergency response times.

28 **Environmentally Preferable/Superior Alternative**

29 Section 1505.2(b) of the Council on Environmental Quality (CEQ) Regulations requires the
30 NEPA lead agency to identify the environmentally preferable alternative in a Record of
31 Decision. The CEQ Regulations define the environmentally preferable alternative as, “...the
32 alternative that will promote the national environmental policy as expressed in NEPA’s Section
33 101. Ordinarily, this means the alternative that causes the least damage to the biological and
34 physical environment; it also means the alternative which best protects, preserves, and enhances
35 historic, cultural, and natural resources.”

36 Similar to the environmentally preferable alternative under NEPA, the State CEQA Guidelines,
37 sections 15120 and 15126.6, subdivision (e)(2), require identification of an environmentally

Chapter 6. Disclosures, Consultation and Coordination, and Other CEQA Considerations

1 superior alternative. If the environmentally superior alternative is the “no project” alternative, the
 2 State CEQA Guidelines, Section 15126.6, subdivision (e)(2), require identification of an
 3 environmentally superior alternative among the Project Alternatives.

4 Both Project Alternatives would achieve the Purpose and Need and Project Goals and
 5 Objectives. Compared to the No Action Alternative and existing conditions, both alternatives
 6 would result in temporary construction-related air quality, biological, cultural, geological, GHG,
 7 hazards and hazardous materials, hydrology and water quality, land use and agricultural, noise,
 8 transportation, and utilities/energy impacts. Additionally, both alternatives would result in
 9 permanent or long-term impacts on biological resources, cultural resources, and agriculture due
 10 to conversions of land.

11 The CER Alternative is the environmentally superior alternative. While the total amount of
 12 permanent impacts on terrestrial habitat and land converted to non-agricultural use would be
 13 slightly greater under the CER Alternative, the nature and duration of construction-related
 14 impacts resulting from the CE Alternative would have a greater impact on air quality, biological
 15 resources, geology and soils, and GHG due to the extended period of construction (10 years
 16 versus three years) and amount of borrow that would be required (6 million cubic yards versus
 17 2.5 million cubic yards). Additionally, the shorter construction duration of the CER Alternative
 18 would allow the benefits of an improved water conveyance system to occur sooner. Table 6-1
 19 provides a comparison of the No Action and Project Alternatives.

20 **Table 6-1. Comparison of Alternatives**

Alternative	Major Characteristics	Impacts	Meets Purpose and Need and Project Objectives?
No Action	No measures would be taken to restore the capacity of the Middle Reach of the FKC	<ul style="list-style-type: none"> • Potentially significant impacts on the following: • Air quality due to fugitive dust from fallowed land • Biological resources, specifically Swainson’s hawk, due to reductions in foraging habitat from fallowed agriculture • Geology and soils due to erosion and loss of topsoil from fallowed agriculture • Groundwater sustainability due to interference with groundwater recharge from reduced FKC capacity • Land use due to land fallowing and land conversions 	No

Alternative	Major Characteristics	Impacts	Meets Purpose and Need and Project Objectives?
CER Alternative	Raise about 13 miles of the existing FKC. Construct a new 20-mile realigned canal; replacement check structures and siphons at Deer Creek and White River; and replacement of road crossings, turnouts, and utilities	<ul style="list-style-type: none"> • Exceedances of NO_x emissions during construction • Temporary and permanent impacts on special-status species and sensitive biological resources/habitat • Significant and unavoidable impacts on FKC • Potential erosion and sedimentation from Project construction, 2.5 million cubic yards of borrow • Demolition of existing facilities possibly containing asbestos and lead • Significant and unavoidable permanent conversion of about 513 acres of important farmland • Significant and unavoidable impacts on emergency vehicle access due to road closures 	Yes
CE Alternative	Raise about 13 miles of the existing FKC. Raise and widen about 16 miles of the FKC and constructing about four miles of bypass canal; replacement check structures and siphons at Deer Creek and White River; and replacement of road crossings, turnouts, and utilities	<ul style="list-style-type: none"> • Greater overall NO_x emissions than the CER Alternative due to longer construction period • Temporary and permanent impacts on special-status species and sensitive biological resources/habitat • Significant and unavoidable impacts on FKC • Higher potential erosion and sediment impacts over CER Alternative due to longer construction duration and construction occurring during winter months, 6-million cubic yards of borrow • Demolition of existing facilities possibly containing asbestos and lead • Significant and unavoidable permanent conversion of about 416 acres of important farmland • Significant and unavoidable impacts on emergency vehicle access due to road closures 	Yes

1 Public Outreach and Agencies/Persons Consulted

2 Project Scoping and Tribal Outreach

- 3 Public scoping activities are conducted as part of compliance with both NEPA and CEQA.
4 Reclamation published the Notice of Intent to prepare an EIS in the Federal Register (Vol. 84,
5 No. 231, Monday, December 2, 2019), as required by NEPA.

1 FWA initiated the CEQA process by issuing a Notice of Preparation on December 2, 2019.
2 Reclamation and FWA received a total of 11 comment submittals (including letters, emails, and
3 verbal comments) during the scoping period.

4 A scoping meeting was held on December 18, 2019, regarding preparation of the EIS/R. A
5 summary of the scoping efforts and outreach efforts to federal and state Native American tribes
6 is provided in Appendix J. Scoping comments, including summaries of comments received at the
7 scoping meeting are included in Appendix J.

8 Reclamation and FWA released the Public Draft Environmental Impact Statement/
9 Environmental Impact Report (Draft EIS/R) on May 7, 2020, for a 45-day public review and
10 comment period. A public meeting was held on June 8, 2020, to provide Project information and
11 accept comments on the Draft EIS/R. The meeting was open for public comments from
12 approximately 6:30 p.m. to 7:30 p.m. No comments on the Draft EIS/R were received during the
13 public meeting.

14 Reclamation and FWA received five comment letters from federal, state, and local agencies; one
15 comment letter from a non-governmental organization; and eight emails from individuals. Copies
16 of the comment letters and emails as well as the response to comments are included in Appendix
17 L. Additionally, Appendix K illustrates all of the changes that were made between the Draft
18 EIS/R and the Final EIS/R that serve to correct, clarify, and update elements of the document,
19 and in some cases, are the direct result of consideration of public comments received on the
20 Draft EIS/R. None of the changes constitute a significant change to the original text, and none of
21 the changes alter the fundamental assessment of environmental impacts.

22 **Agencies/Persons Consulted**

23 This section discusses agency consultations and coordination that occurred during the
24 development of the EIS/R and summarizes the agency involvement activities undertaken by
25 Reclamation and FWA to satisfy NEPA and CEQA.

26 Stakeholder involvement has been and continues to be facilitated through independent
27 stakeholder meetings.

28 FWA contacted the responsible and trustee agencies through circulation of the NOP as required
29 under CEQA. The following responsible agencies under CEQA were contacted: California
30 Highway Patrol, Caltrans, Office of Historic Preservation, Department of Water Resources,
31 Regional Water Board, SJVAPCD, Tulare County, and Kern County. CDFW was contacted as a
32 trustee agency. As noted in Section 1, Reclamation also contacted federal, state, and local
33 agencies regarding their potential participation as Cooperating Agencies.

34 **Consultation under Section 106 of the National Historic Preservation Act**

35 The Section 106 process that is typically associated with NEPA compliance requires consultation
36 of the federal lead agency with other federal, state, and local agencies, the Advisory Council on
37 Historic Preservation, the SHPO, Indian tribes, and interested members of the public, such as
38 historical societies. Throughout the Section 106 process, the federal lead agency and consulting
39 parties work together to identify adverse impacts on sites of cultural significance or historic
40 properties and seek ways to avoid, minimize, or mitigate the adverse effects. A Memorandum of

1 Agreement or PA is issued by the participating parties that includes the measures agreed upon to
2 avoid or reduce (i.e., mitigate) adverse effects. For large or complex undertakings, a PA may also
3 be negotiated to develop a phased approach to historic properties management or alternative
4 Section 106 processes through consultations. Thus, impacts on cultural resources that are
5 included in the NEPA document are addressed through Section 106 and Reclamation's existing
6 PA regarding the FKC that is currently being amended to address the current Project.

7 The NAHC was contacted to request a Sacred Lands File search for sacred sites within the
8 Project APE. The NAHC responded that its records show an absence of sacred sites but provided
9 an extensive contact list of Native Americans who may have information about the Project APE.
10 Reclamation and FWA have conducted outreach to Native American Tribes and will continue to
11 consult with Indian Tribes and Native American tribal representatives who may have knowledge
12 of or an interest in the Project.

13 **Consultation with USFWS under Section 7 of the Endangered Species Act**

14 The ESA was established to protect and recover imperiled species and the ecosystems on which
15 they depend. The USFWS and the NMFS administer the act and are responsible for consulting
16 with other federal agencies under Section 7 of the ESA to ensure that their actions do not
17 jeopardize the continued existence of endangered or threatened plant and animal species or result
18 in the destruction or adverse modification of designated critical habitat for these species.

19 There are no species under the jurisdiction of the NMFS within the Project area, therefore
20 Reclamation will not be consulting with NMFS. Two species (BVLS and SJKF) that are
21 federally listed as endangered potentially occur in the Project area, and implementation of the
22 Project may result in take of these species or their habitat.

23 Reclamation and FWA coordinated with the USFWS early in the planning process. Reclamation
24 prepared a BA to analyze the potential effects of the Project on federally listed species which
25 concluded that the Project may adversely affect the endangered BVLS and SJKF. Reclamation
26 submitted the BA to the USFWS on December 23, 2019. On July 23, 2020, Reclamation
27 received a biological opinion from the USFWS that concluded the Project is not likely to
28 jeopardize the continued existence of the SJKF and BVLS.

29 **Distribution List**

30 This section provides a list of those federal, state, and local agencies, as well as Indian Tribes,
31 organizations, and individuals that were be notified of this EIS/R (Table 6-2). A notice of
32 availability was also widely distributed, indicating the document was available for viewing on
33 the following websites:
34 https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=41341 and
35 <https://friantwater.org/>. Reclamation and FWA will also notify those on the list of the availability
36 of the Final EIS/R as well as issue a notice of availability once it is posted.

1 **Table 6-2. Draft EIS/R Distribution List**

Federal Agencies	State Agencies	Local Agencies	Individuals/ Tribes
U.S. Army Corps of Engineers U.S. Fish and Wildlife Service U.S. Environmental Protection Agency	California Department of Fish and Wildlife California Department of Transportation California Highway Patrol California Regional Water Quality Control Board Department of Water Resources Native American Heritage Commission	San Joaquin Valley Air Pollution Control District Tulare County Kern County City of Porterville	Friant Division Long-Term Contractors

2

1 Index

2

- 3 Bureau of Reclamation (Reclamation), xi, xii, xiii,
- 4 xiv, 1, 3, 4, 5, 7, 8, 10, 15, 16, 19, 21, 25, 28,
- 5 50, 53, 57, 62, 68, 74, 77, 78, 83, 85, 109,
- 6 115, 125, 129, 130, 131
- 7 California Department of Fish and Wildlife
- 8 (CDFW), 5, 23, 63, 65, 68, 70, 130
- 9 California Department of Transportation
- 10 (Caltrans), 5, 48, 102, 103, 105, 107, 118, 130
- 11 California Energy Commission (CEC), 52
- 12 California Environmental Quality Act (CEQA), xi,
- 13 xiii, xiv, 1, 4, 5, 7, 8, 18, 21, 44, 50, 53, 54, 58,
- 14 63, 72, 76, 80, 81, 82, 83, 85, 89, 93, 99, 103,
- 15 109, 110, 115, 125, 126, 127, 128, 129, 130
- 16 California Register of Historical Resources
- 17 (CRHR), 25, 26, 27, 71, 72, 109, 120
- 18 California State Historic Preservation Officer
- 19 (SHPO), 5, 25, 74, 130
- 20 Central Valley Project (CVP), xi, xii, xiii, 1, 4, 8,
- 21 15, 71, 73, 75, 116, 117
- 22 Central Valley Regional Water Quality Control
- 23 Board (Regional Water Board), 4, 40, 130
- 24 Clean Air Act, 5
- 25 Clean Water Act (CWA), 4, 40, 120
- 26 Council on Environmental Quality (CEQ), 127
- 27 Deer Creek, xix, 9, 11, 14, 18, 24, 25, 26, 28, 33,
- 28 38, 40, 41, 59, 63, 64, 67, 68, 70, 71, 78, 92,
- 29 101, 121, 129
- 30 Endangered Species Act (ESA), 4, 119, 131
- 31 Environmental Commitments/Mitigation
- 32 Measures (ECs/MMs), xiv, xv, xvi, 18, 53, 58,
- 33 59, 61, 62, 65, 66, 67, 68, 69, 70, 73, 74, 75,
- 34 76, 77, 78, 79, 80, 83, 85, 86, 87, 88, 89, 91,
- 35 92, 95, 98, 106, 107, 108, 113, 114, 119, 120,
- 36 121, 122, 123, 126, 127
- 37 Fresno, City of, xi, 1, 37, 60
- 38 Fresno, County of, xi, 1, 21, 116
- 39 Friant Dam, xi, xii, xiii, 1, 3, 4, 16, 37, 71
- 40 Friant Division long-term contractors (Friant
- 41 Contractors), xi, xii, xiii, 1, 3, 4, 5, 7, 8, 15, 91,
- 42 110, 116, 126, 127
- 43 Friant Water Authority (FWA), xi, xii, xiv, 1, 3, 4,
- 44 7, 8, 10, 16, 21, 37, 50, 51, 53, 57, 58, 62, 63,
- 45 74, 83, 85, 109, 125, 130, 131
- 46 Friant-Kern Canal (FKC), xi, xii, xiv, 1, 3, 4, 7, 8, 9,
- 47 10, 13, 15, 16, 17, 18, 19, 23, 24, 25, 27, 28,
- 48 31, 33, 35, 36, 37, 38, 40, 41, 42, 43, 45, 46,
- 49 47, 48, 49, 57, 63, 64, 66, 69, 71, 72, 73, 74,
- 50 75, 76, 77, 78, 79, 86, 87, 90, 91, 93, 94, 95,
- 51 97, 99, 102, 103, 109, 110, 112, 116, 117,
- 52 119, 120, 121, 122, 126, 127, 128, 129, 131
- 53 General Conformity Rule (GCR), 54, 57, 61
- 54 Kern River, xi, 1, 37, 41, 50
- 55 Kern, County of, xi, 1, 5, 14, 21, 22, 27, 30, 31,
- 56 33, 35, 36, 37, 42, 43, 44, 45, 46, 47, 48, 49,
- 57 51, 52, 58, 69, 87, 94, 95, 96, 100, 103, 105,
- 58 106, 107, 108, 113, 121, 130
- 59 Madera Canal, xi, 1, 3, 37, 116
- 60 Madera, County of, xi, 1, 21
- 61 Merced, County of, xi, 1, 21, 116
- 62 Middle Reach, xi, xii, 1, 3, 4, 7, 8, 9, 15, 49, 63,
- 63 128
- 64 Millerton Lake, xi, xii, xiii, 1, 4, 8, 15, 37
- 65 National Environmental Policy Act (NEPA), xi,
- 66 xiv, 1, 4, 5, 8, 18, 50, 53, 54, 72, 115, 125,
- 67 126, 127, 129, 130
- 68 National Historic Preservation Act (NHPA), 5,
- 69 50, 73, 75
- 70 National Marine Fisheries Service (NMFS), 63,
- 71 65, 70, 131
- 72 National Register of Historic Places (NRHP), 25,
- 73 26, 27, 71, 72, 120
- 74 Native American Heritage Commission (NAHC),
- 75 50, 74, 131
- 76 Porterville, City of, 14, 23, 35, 38, 42, 43, 47, 48,
- 77 49, 50, 51, 59, 60, 87, 97, 100, 102, 106, 108,
- 78 116, 117, 118, 123
- 79 San Joaquin River (SJR), xi, xiii, 1, 3, 7, 8, 15, 28,
- 80 37, 38, 110, 116, 121
- 81 San Joaquin River Restoration Settlement Act
- 82 (Settlement Act), xi, 3, 37, 116
- 83 San Joaquin Valley Air Pollution Control District
- 84 (SJVAPCD), 5, 23, 34, 54, 55, 56, 57, 59, 61,
- 85 62, 81, 82, 83, 84, 86, 87, 88, 89, 119
- 86 Southern San Joaquin Valley Information Center
- 87 (SSJVIC), 25
- 88 Strathmore Public Utilities District (SPUD), 51

1	Sustainable Groundwater Management Act	11	Tule River, xiv, 9, 10, 17, 23, 24, 28, 33, 36, 38,
2	(SGMA), 7, 8, 15, 57, 58, 82, 90, 94, 121	12	40, 41, 48, 50, 117, 118, 121
3	Tulare County Association of Governments	13	U.S. Army Corps of Engineers (USACE), 4, 5
4	(TCAG), 48, 107	14	U.S. Environmental Protection Agency (EPA), 34,
5	Tulare Lake, 38, 40, 41, 90, 91, 92, 93	15	40, 86
6	Tulare, County of, xi, 1, 5, 14, 21, 22, 27, 30, 31,	16	U.S. Fish and Wildlife Service (USFWS), 4, 63,
7	32, 35, 36, 37, 38, 40, 41, 42, 43, 44, 45, 46,	17	64, 65, 68, 70, 131
8	47, 48, 49, 51, 58, 69, 87, 88, 94, 95, 96, 100,	18	White River, xix, 9, 11, 14, 17, 18, 24, 25, 26, 28,
9	103, 105, 106, 107, 108, 113, 117, 118, 121,	19	38, 40, 59, 63, 64, 68, 69, 71, 92, 101, 121,
10	130	20	129
21			