

# RECLAMATION

*Managing Water in the West*

**Final Environmental Assessment**

## **Article 5 Exchanges between Cross Valley Contractors and other Water Districts for Delivery of Central Valley Project Water – 2010 and 2011**

**EA-10-36**



**U.S. Department of the Interior  
Bureau of Reclamation  
Mid Pacific Region  
South-Central California Area Office  
Fresno, California**

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## **Mission Statements**

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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# List of Acronyms and Abbreviations

AEWSD	Arvin Edison Water Storage District
AF/y	acre-feet per year
Aqueduct	California Aqueduct
APE	area of potential effects
BO	Biological Opinion
CAA	Clean Air Act
CV	Cross Valley
CVC	Cross Valley Canal
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
Delta	Sacramento-San Joaquin River Delta
DWR	California State Department of Water Resources
EA	Environmental Assessment
ESA	Endangered Species Act
FKC	Friant-Kern Canal
ITA	Indian Trust Assets
KCWA	Kern County Water Agency
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
PEIS	Programmatic Environmental Impact Statement
Reclamation	Bureau of Reclamation
Service	U.S. Fish and Wildlife Service
SHPO	State Historic Preservation Office
SJV	San Joaquin Valley
SJVAB	San Joaquin Valley Air Basin
SLC	San Luis Canal
State	State of California
SWP	State Water Project
TLBWSD	Tulare Lake Basin Water Storage District

# Section 1 Purpose and Need for Action

## 1.1 Background

The Cross Valley (CV) contractors are seven Central Valley Project (CVP) contractors located on the eastside of the San Joaquin Valley (SJV) in Fresno, Kern, Tulare and Kings Counties. These water districts are referred to as the CV contractors because of their use of the Cross Valley Canal (CVC) to obtain their water supply. The CVC is a privately-owned canal that was constructed in the mid-1970s through a collaborative effort of several state and federal water agencies. The CVC allows water to be conveyed between the California Aqueduct (Aqueduct) and the Friant Kern Canal (FKC). Table 1 identifies the CV contractors, their subcontractors (if any), and whether or not they have a Friant Division CVP contract. Figures 1 and 2 show the location of the CV contractors and depicts their juxtaposition to other CVP contractors and important features of the State Water Project (SWP), CVP, and the CVC.

Table 1. List of Cross Valley Contractors
<sup>1</sup> County of Fresno
<sup>2</sup> County of Tulare
Hills Valley Irrigation District
<sup>3</sup> Kern Tulare Water District
<sup>4</sup> Lower Tule River Irrigation District
Pixley Irrigation District
Tri-Valley Water District
<sup>1</sup> County of Fresno includes Fresno County Service Area #34
<sup>2</sup> County of Tulare subcontractors include Alpaugh Irrigation District, Atwell Water District, Hills Valley ID, Saucelito ID <sup>4</sup> , Fransinetto Farms, Stone Corral ID <sup>4</sup> , City of Lindsay <sup>4</sup> , Strathmore Public Utility District, Styrotek, Inc., and City of Visalia
<sup>3</sup> Kern Tulare Water District and Rag Gulch Water District consolidated on January 1, 2009.
<sup>4</sup> Lower Tule River ID, Saucelito ID, Stone Corral ID and City of Lindsay receive CVP water under more than one contract, either as a Friant and/or Cross Valley Contractors.

In 1976, the CV contractors entered into water service contracts with the Bureau of Reclamation (Reclamation) for CVP water. Although the CV contractors are situated on the eastside of the SJV amongst the Friant Division CVP contractors, the CV contractors’ CVP water is pumped from the Sacramento-San Joaquin River Delta (Delta) by the Department of Water Resources (DWR) and/or Reclamation where the water is conveyed in the San Luis Canal (SLC)/Aqueduct for delivery into the CVC. Due to direct conveyance hurdles, Reclamation envisioned that the CV contractors would obtain their CVP supplies via exchanges. The exchange arrangements are set forth in Article 5(a) of the CV contractor’s water service contract, which in part states that “...the parties acknowledge that Project Water furnished to the Contractor...shall be delivered to the Contractor by direct delivery via the CVC and/or by exchange arrangements involving Arvin-Edison Water Storage District (AEWSD) or others. The parties further acknowledge that such arrangements are not transfers subject to Section 3405(a) of the CVPIA [Central Valley Project Improvement Act].” (Project Water as used in this Environmental Assessment (EA) is defined as water that is developed, diverted, stored, or delivered by the Secretary of the Interior in accordance with the statutes authorizing the CVP and in accordance with all terms and conditions of water rights acquired pursuant to California law.)

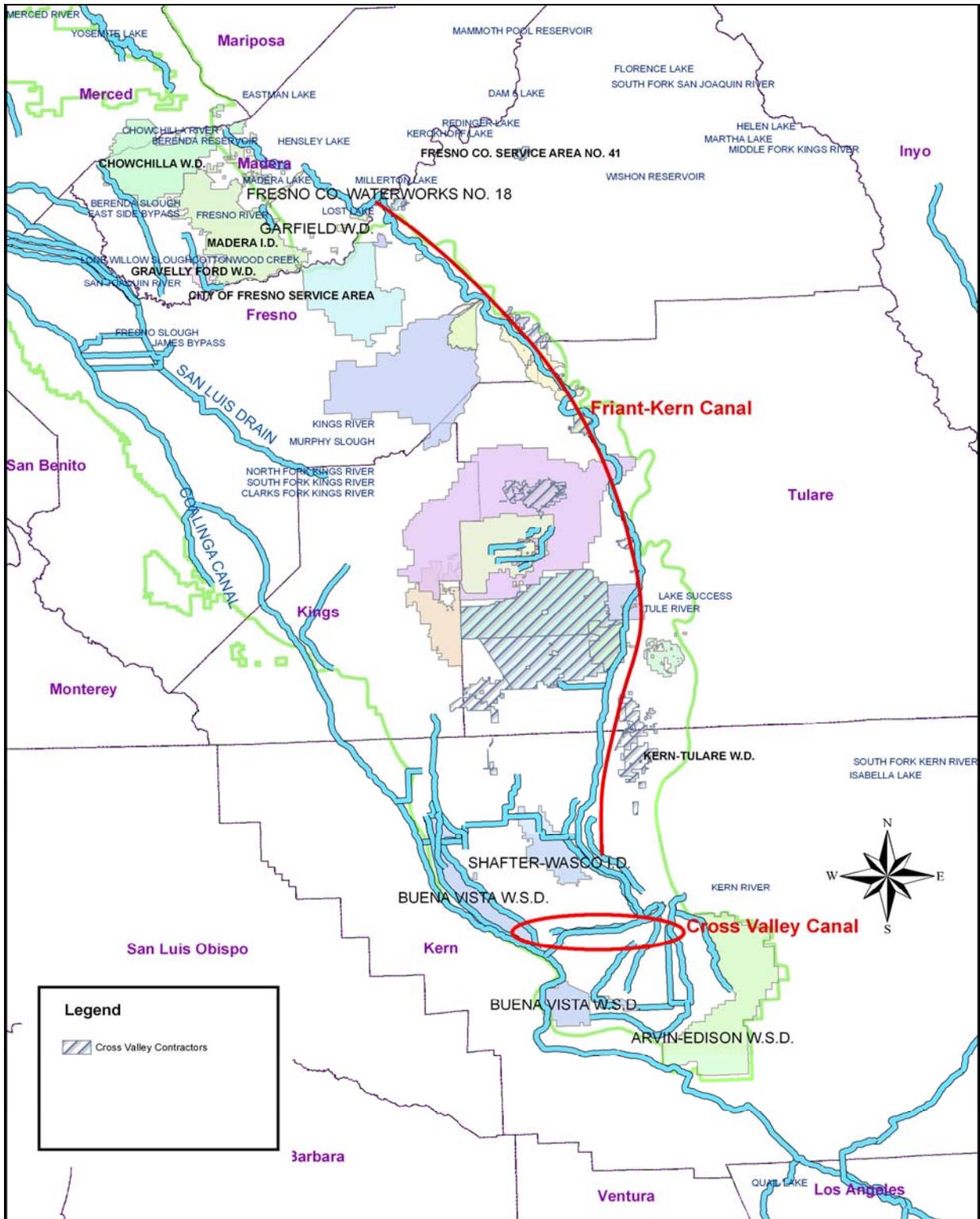


Figure 1. Project Overview Map with Friant Division CVP Contractors

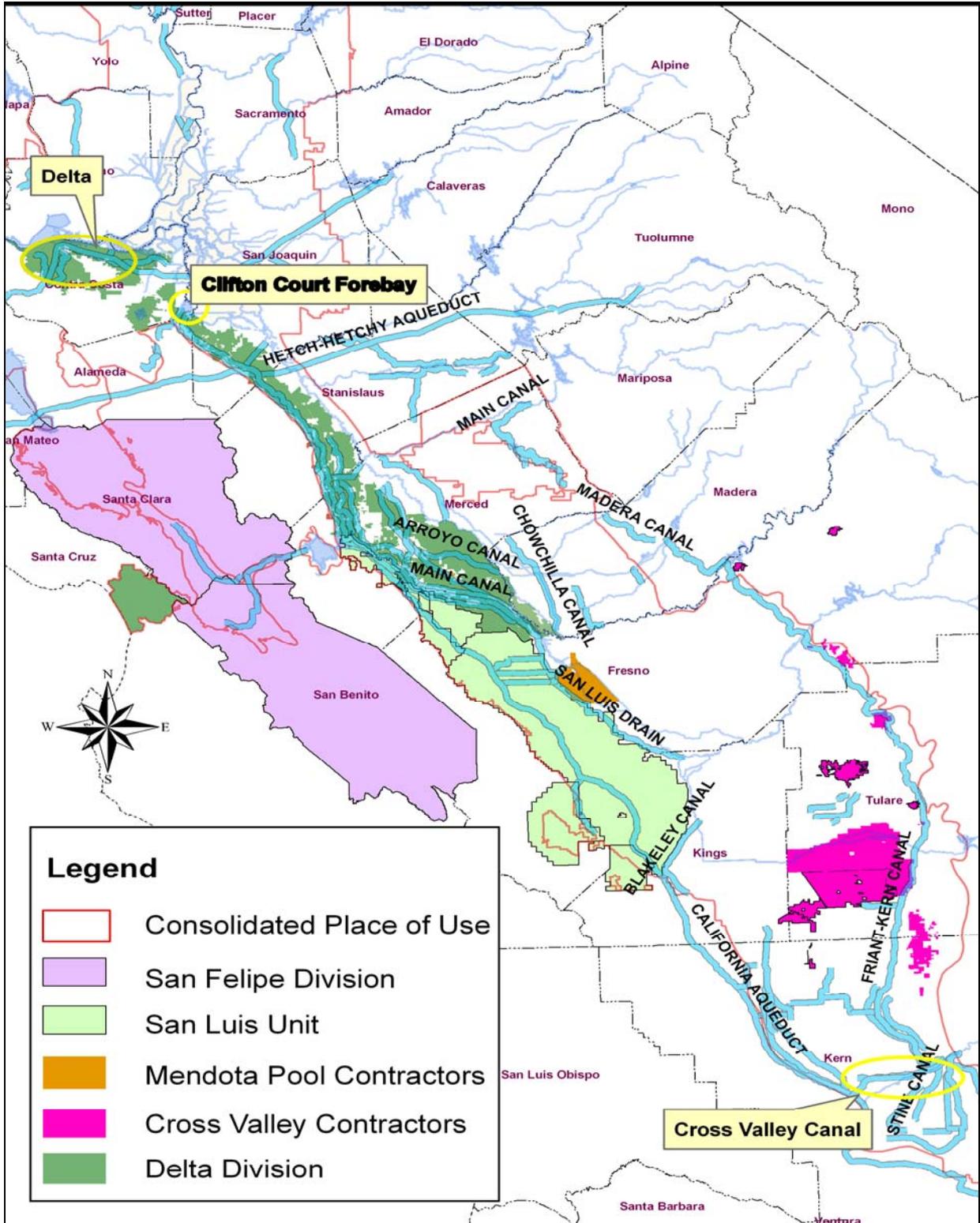


Figure 2. Project Overview Map with other CVP Divisions and Contractors

## **1.2 Purpose and Need**

Historically, the CV contractors' CVP water was delivered through the CVC and exchanged with AEWS. AEWS would divert the CV contractor Delta supplies from the CVC and use it to meet their in-district water supply demands. In exchange, AEWS's Friant Division CVP water supply was diverted by the CV contractors from the FKC and used to meet their needs. Only Kern-Tulare Water District has direct access from the CVC via privately owned siphons, which transports their water from the CVC to the FKC; however, the existing facilities provide a limited amount of water. Due to changing conditions, AEWS has discontinued exchange relationships with some of the CV contractors. For instance, Pixley Irrigation District and Lower Tule River Irrigation District have transferred their water to other districts and used the money to purchase local supplies instead of exchanging with AEWS.

The CV contractors cannot take direct delivery of their CVP water supplies from the Delta and need to enter into exchange arrangements with other contractors, including AEWS. If no action is taken, Reclamation could still process the exchanges on an individual basis; however, the timing for approval could exceed the window of opportunity to deliver and utilize the water. The purpose of the Proposed Action is to provide delivery of the CV contractors' CVP water supply on a demand schedule where the CV contractors' have the ability to take delivery of their water supplies in large quantities and during short periods of time.

## **1.3 Scope**

The CV contractors need exchange mechanisms in place in order to receive delivery of up to 128,300 acre-feet per year (AF/y) of their contractual CVP water supply from the Delta. This EA has been prepared to analyze the Proposed Action and No Action Alternative associated with Article 5(a) exchange arrangements of CVP Delta water supplies with Friant Division CVP water supplies and other sources (other sources of water include rivers, streams, creeks, groundwater, and SWP water). The CV contractors and potential exchange partners (other CVP contractors and non-CVP contractors) are all located within Fresno, Tulare, Kings, and Kern Counties.

This EA analyzes the 2010 and 2011 contract years which runs from March 1, 2010 through February 29, 2012. This EA covers the broadest flexibility for exchange arrangements known at this time. Proposed exchange arrangements not covered in this National Environmental Policy Act (NEPA) and Endangered Species Act (ESA) review process would require separate and/or tiered environmental review to cover the site specific proposal and analysis of environmental impacts to the human environment.

## **1.4 Potential Issues**

This EA will analyze the potential and cumulative impacts (both direct and indirect) associated with the Proposed Action and No Action Alternative to the following: water resources, land use, biological resources, cultural resources, Indian Trust Assets (ITA), socioeconomics, environmental justice, air quality, and global climate.

## **1.5 Reclamation's Legal and Statutory Authorities and Jurisdiction Relevant to the Proposed Federal Action**

Several Federal laws, permits, licenses, policy requirements, and past environmental documents have directed, limited or guided the NEPA analysis and decision-making process of this EA and include the following (all of which are hereby incorporated by reference):

### **Reclamation Reform Act**

The Reclamation Reform Act of 1982 applies to all irrigation land within an irrigation/water district, which has a water service contract with Reclamation and is subject to the acreage limitation and full-cost provisions of Reclamation law. Acquisition of irrigation water by exchange shall not subject the non-CVP users of such water to Federal Reclamation law and the associated rules and regulations.

### **Programmatic Environmental Impact Statement for the CVPIA**

Reclamation completed the Final Programmatic Environmental Impact Statement (PEIS) for the CVPIA in October 1999 that analyzed alternatives and implementation of the CVPIA. The Record of Decision was signed in January 9, 2001.

### **Programmatic Biological Opinion on Implementation of the CVPIA and Continued Operation and Maintenance of the CVP**

The U.S. Fish and Wildlife Service (Service) issued the Programmatic Biological Opinion on Implementation of the CVPIA and Continued Operation and Maintenance of the CVP (CVPIA PBO) (File Number 1-1-01-I-0311) in November 2000.

Reclamation's program to implement the CVPIA included the renewal of all existing CVP contracts as a core program (CVPIA PBO, Pages 2-29 to 2-36). The CVPIA project description listed nine significant areas of commitment that provided the basis of the PBO no jeopardy finding (page 2-50 to 2-71). These nine areas of commitment are listed below:

1. Commitments Associated with Implementation of the CVPIA.
  - Anadromous Fisheries Restoration Activities (§3406(b)(1)).
  - Habitat Restoration Program (§3406(b)(1) other).
2. Commitments Associated with Long-term Renewal of CVP Water Contracts.
3. Commitments for Activities Associated with CVP Water and/or Facilities.
4. Commitments Associated with CVP Conveyance and Storage.
5. Commitments Associated with Operations and Management Planning.
6. Commitments Associated with Conservation Programs.
  - Wildlife Habitat Augmentation Program (Wetland Development Program).
  - CVP Conservation Program.
  - Comprehensive Mapping Program.
7. Commitments Associated with Drainage.
8. Commitments Associated with General Consultation Process.
9. Commitments and Strategy to Ensure Compliance with the ESA.

Pages 2-69 and 2-70, Section VI. I. 7 and 8 state:

“7. CVP or CVPIA actions or parts of actions, which may affect listed species or for which there is not enough information available to estimate take or make a not likely to adversely affect determination, will receive future tiered analysis and consultation. Reclamation or the Service will provide to the Service’s SFWO Endangered Species Division, dependent on lead agency status, clear descriptions of proposed CVP or CVPIA actions, specific areas that may be affected directly or indirectly by these actions, the manner in which the actions may affect any listed species or designated critical habitat, and other relevant reports and information. Reclamation and the Service will also identify any and all interrelated and interdependent actions and measures related to the proposed CVP or CVPIA action. In those situations where the lead agency, or the Service’s SFWO Endangered Species Division, determines that an action may affect listed species or may adversely modify designated critical habitat, Reclamation and/or the Service will initiate informal or formal consultation as appropriate.

8. Reclamation and the Service will work together to develop means to more effectively facilitate ESA compliance through the coordination of activities and commitments discussed in this Project Description. This coordination will include establishment of a process within three months of this biological opinion that will provide necessary information to the Service’s SFWO Endangered Species Division in situations where a determination of no effect has been made, sufficiently in advance, to enable the Service’s review.”

### **Biological Opinions for the Continued Long-term Operation of the CVP and SWP**

On July 30, 2004, the Service issued Biological Opinion (BO) 1-1-04-F-0140, which addressed the effects of operating the CVP/SWP and delivering CVP water for renewing water contracts and other actions on the threatened delta smelt (Service 2004). On February 16, 2005, the Service issued BO 1-1-05-F-0055 in response to Reclamation's November 3, 2004, request for re-initiation of formal consultation on the then existing Operations Criteria and Plan (OCAP) to address potential critical habitat issues and effects of the CVP/SWP operations on delta smelt (Service 2005).

The Department of the Interior was sued on this BO. Reclamation reinitiated consultation and the BO was found legally insufficient by Judge Wanger of the U.S. District Court for the Eastern District of California (Court). Judge Wanger ordered that a new BO be developed by September 15, 2008. Subsequently, an extension was requested and granted, and a new BO was issued on December 15, 2008 (Service 2008). The Service concluded that the coordinated operations of the CVP and SWP, as proposed, were likely to jeopardize the continued existence of the delta smelt, and were likely to adversely modify the delta smelt’s critical habitat. The Service developed a reasonable and prudent alternative (RPA) that the Service believes will avoid jeopardy and adverse modification. On December 15, 2008, Reclamation issued a memo to the Service provisionally accepting the RPA. Reclamation found that two of the components of the RPA require further review and refinement to determine whether their implementation is reasonable and prudent. If Reclamation, in coordination with DWR, finds that these two components are not reasonable and prudent, Reclamation will reinitiate consultation. In the meantime, Reclamation committed to immediately implement the RPA by modifying operations as required to comply with the RPA.

The National Marine Fisheries Service (NMFS) issued a non-jeopardy BO with regard to impacts of the proposed revised operations for the then existing OCAP, dated October 22, 200. On April 16, 2008, Judge Wanger issued a Memorandum Decision and Order on the Cross-Motions for Summary Judgment filed in PCFFA *et al.* (PCFFA v. Gutierrez 2008). The Court found that the BO issued by the NMFS in 2004 was legally insufficient. Judge Wanger remanded the BO without vacatur and ordered a new BO be developed by March 2, 2009.

### **Cross Valley Unit Long-Term Contract Renewal Final EA**

A Finding of No Significant Impact (FONSI) and Final EA, *Cross Valley Unit Long-Term Contract Renewal*, dated January 19, 2001 (Reclamation 2001a) was prepared by Reclamation to analyze the impacts associated with the renewal of a long-term (25 years) water service contract with the CV contractors. Reclamation determined that new information has become available since the signing of the 2001 EA and FONSI for the Long-Term Contract Renewal for the CV contractors, and prepared a Supplemental EA and FONSI (Reclamation 2001b). Once ESA compliance is completed on the continued long-term operation of the CVP and SWP, Reclamation will update the existing environmental documents in anticipation of renewing Cross Valley contractors' interim contracts.

### **EA for the Interim Renewal of Cross Valley Contracts**

A FONSI and Final EA, *2010 Renewal of Cross Valley Interim Water Service Contracts and Delta/San Felipe Division Contracts through February 29, 2012*, were completed in February 2010 (Reclamation 2010). This EA evaluated the execution of up to nine interim renewal water service contracts (IRC) between Reclamation and CVP contractors including the CV contractors. The existing CV IRC expired on February 28, 2010. The CV contractors were in their twelfth IRC and the proposed renewal was the thirteenth. The EA evaluated the continuation of the existing IRC, with only minor, administrative changes to the contract provisions to update the previous IRC for the new contract period. These IRC expire February 28, 2012.

### **Friant Division Long-Term Contract Renewal Final EA**

A Final EA, *Friant Division Long-Term Contract Renewal*, dated January 19, 2001, (Reclamation 2001a) was prepared by Reclamation to analyze the impacts associated with the renewal of long-term (25 years) water service contracts with the Friant Division CVP contractors.

### **Biological Opinion on Bureau of Reclamation Long-Term Contract Renewal of Friant Division and Cross Valley Unit Contractors**

The Friant Division requested a formal consultation with the Service pursuant to section 7 of the ESA, as amended, as part of renewal of 28 long-term water service contracts. Reclamation committed to initiating consultation on other aspects of the CVP so that interrelated and interdependent impacts and cumulative impacts on species outside the SJV could be fully addressed. With that in mind, the Service issued its BO on October 15, 1991 and Amendment of the BO on May 14, 1992 (Service 1991, 1992). In their BO, the Service stated that renewal of the 28 long-term contracts would not likely jeopardize the continued existence of 15 threatened and endangered species found within the Friant Division service area, provided Reclamation implement short and long-term endangered species conservation programs to mitigate the adverse impacts of continued CVP water delivery to the Friant Division. This program also

committed the Service to participate by providing technical assistance and developing revised recovery plans for the SJV species needed for the timely resolution of listed species concerns. With contract renewal, the Friant Division CVP will continue to fulfill CVP purposes, while avoiding adverse impact to threatened and endangered species.

The BO, *U.S. Bureau of Reclamation Long-Term Contract Renewal of Friant Division and Cross Valley Unit Contractors*, January 19, 2001, File Number 1-1-01-F-0027 (LTCR Opinion) was prepared by the Service to address the proposed renewal by Reclamation of water service contract with the Friant Division and CV Units of the CVP in accordance with Section 7 of the ESA (Service 2001). The Service concluded that the renewal for 25 years of CVP water service contracts is not likely to jeopardize 34 listed species. However, transfers and/or exchanges involving Friant Division or CV contractors were not addressed by the BO. The LTCR Opinion did not address some of the species and critical habitats covered in this EA, because their listings/designations occurred after the LTCR Opinion was issued. These species and critical habitats are: the vernal pool fairy shrimp, the vernal pool tadpole shrimp, all critical habitats for vernal pool species, and critical habitat for the California tiger salamander.

### **Accelerated Water Transfer Program (AWTP)**

A Finding of No Significant Impact (FONSI) and Final EA for the AWTP of the Friant Division CVP contractors, dated February 28, 2006 (Reclamation 2006), were completed. The EA was prepared to analyze the impacts of temporary transfers and exchanges of up to 150,000 AF/y of CVP water between CVP contractors within the Friant Division. The actions analyzed included the typical transfers and exchanges for agriculture water that were for short-term (less than a one year time period), local, and between Friant Division CVP contractors. The AWTP EA was subsequently supplemented to allow for transfers under the AWTP of up to 255,000 AF/y.

### **Biological Opinion on the Operations and Maintenance Program on Bureau of Reclamation Lands within the South-Central California Area Office (SCCAO)**

The Service issued this opinion (1-1-04-F-0368), dated February 17, 2005, for routine operations and maintenance (O&M) activities on SCCAO lands in San Joaquin, Stanislaus, Merced, Madera, Fresno, Santa Clara, San Benito and Contra Costa Counties. The opinion addressed potential adverse effects on the California tiger salamander, vernal pool fairy shrimp, valley elderberry longhorn beetle, blunt-nosed leopard lizard, vernal pool tadpole shrimp, San Joaquin woolly-threads, California red-legged frog, giant garter snake, San Joaquin kit fox, and proposed critical habitat for California tiger salamander, and California red-legged frog. Additionally, the Service concurred that the Proposed Action was not likely to adversely affect the Conservancy fairy shrimp, longhorn fairy shrimp, succulent owl's-clover and its critical habitat, Hoover's spurge and its critical habitat, the giant kangaroo rat, California condor, bald eagle, delta smelt, San Joaquin adobe sunburst, California clapper rail, salt marsh harvest mouse, Greene's tuctoria and its critical habitat, SJV Orcutt grass and its critical habitat and critical habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp.

### **Article 5 Exchanges**

Since 1976, the CV contractors have had to rely on exchanges with AEWS and/or others in order to receive their CVP water supply from the Delta. Reclamation has historically analyzed one-year approvals for these Article 5 exchange arrangements, most recently in 2008 and 2009.

# Section 2 Alternatives Including the Proposed Action

## 2.1 No Action Alternative

Under the No Action Alternative, historical exchanges between AEWS D and the CV contractors to allow delivery of the CV contractors' contract supplies would continue as in the past. Some of the CV contractors who do not have an exchange agreement with AEWS D would have to transfer their water as in the past or develop new exchange arrangements, which would require Contracting Officer approval and separate environmental analysis on a case by case basis.

## 2.2 Proposed Action

Reclamation proposes to approve the CV contractors' exchange arrangements with individually proposed exchange partners for the 2010 and 2011 contract years for up to the full CV contractors' CVP contract supply of 128,300 AF/y. In addition, the Proposed Action would include the continued historical exchanges between the CV contractors and AEWS D. Potential exchange partners are identified in Tables 3 through 10 in Section 3.

Due to varying hydrological conditions, loss due to evaporation and/or seepage, differences in the value of water, and/or timing, imbalanced exchanges could occur (Appendix B further explains the scenarios for imbalanced exchanges). Under the Proposed Action, imbalanced exchange arrangements would be limited to a ratio of 2:1. Proposed exchange arrangements exceeding this amount are not within the scope of this analysis and subsequent environmental review(s) would be required. A 2:1 imbalanced exchange occurs when the first component of the exchange, the CV contractors' annual allocation (not to exceed 128,300 AF/y), would be delivered to a participating entity. As the second component of the exchange, no less than 50 percent of the water that was delivered in the first component of the exchange to the participating entity would be delivered to the CV contractors. Possible exchange arrangements could be completed as follows, and is more specifically described in Appendix B:

### 1. Historical exchanges with AEWS D

- The CV contractors' CVP water is conveyed down the Aqueduct where it would be diverted by AEWS D turnouts off the Aqueduct or CVC. In return, AEWS D's Friant Division CVP water is diverted from the FKC into the CV contractors' respective turnouts.

### 2. Exchanges with Friant Division CVP contractors

- The CV contractors' water is conveyed down the Aqueduct and diverted into the CVC. The water is then pumped from the CVC into the FKC and delivered to a Friant Division CVP contractor. In return, the Friant Division CVP contractor's water is diverted from the FKC into the CV contractors' respective turnouts.

### 3. Exchanges with SWP contractors

- The CV contractors' water is conveyed down the Aqueduct where it is diverted by a SWP contractor. In return, The SWP contractor's water is diverted from the Aqueduct into the CVC where the water is then pumped into the FKC and ultimately delivered to the CV contractors. In addition, previously SWP contractor banked water in Kern County could be extracted into the CVC and pumped into the FKC and delivered to the CV contractors.

### 4. Exchanges with Tulare Lake Basin Water Storage District (TLBWSD) contractors

- The CV contractors' water is conveyed down the Aqueduct where it is diverted by TLBWSD contractors. In return, TLBWSD contractors deliver non-project water from Pine Flat, Kaweah, or Success Lake to Friant Division CVP contractors utilizing the same local system (non-CVP facilities). The Friant Division CVP contractors' water is then diverted from the FKC by CV contractors.

CVP water may be wheeled under Article 55 of a SWP contract as one component of the exchange. Article 55 of the SWP contracts allows for the SWP contractor to convey non-SWP water in their increment of capacity in the Aqueduct. Under this scenario, a SWP contractor would request DWR to convey a CV contractor's CVP water, if capacity exists, in the Aqueduct. This option results in elevating the CV contractor's priority for DWR to convey the water.

CVP water is tracked from its origin to its final disposition (end use) and does not lose its Federal characteristics under the California water rights permits. Water supplies would be used in compliance with the applicable water rights permits and conform to the applicable purpose and place-of-use of the associated water rights permit. In addition, the following commitments are part of the Proposed Action:

- Commitments from Section 1.5;
- The water may be used for either Agricultural or M&I purposes;
- No native or untilled land (fallow for three years or more) may be cultivated with this water;
- No new construction or modification of existing facilities is to occur in order to complete the Proposed Action;
- No changes in the point of diversion or places-of-use without prior approvals from the State Water Resources Control Board, Reclamation, and/or DWR as applicable;
- No unmitigable impacts can be caused to a third party without discussion between the parties involved;
- Exchanges must not alter the quality of water, or the hydrological regime of natural waterways or natural watercourses such as rivers, streams, creeks, lakes, ponds, pools, or wetlands, etc., in a way that may have a detrimental effect on fish or wildlife or their habitats;
- All exchanges must comply with all applicable Federal, state and local laws, regulations, permits and policies; and
- Reclamation would review each exchange proposal for compliance with the above conditions prior to approval and execution of the action, and determination that the action is consistent with the criteria described within this NEPA analysis.

# Section 3 Affected Environment and Environmental Consequences

The context for this EA is the SJV within Fresno, Tulare, Kings, and Kern Counties. Water districts within these counties are characterized as either CVP contractors including the CV contractors, or other water districts (non-CVP contractors) who would participate as potential exchange partners. This section identifies the affected environment and potential environmental consequences resulting from the No Action Alternative and Proposed Action.

Reclamation has historically analyzed Article 5 exchanges for the CV contractors on an annual basis, most recently for the years 2008 and 2009 (Reclamation 2007, 2008). Since much of the affected environment is the same as has been analyzed in the past and can be found in the 2007 and 2008 documents, the following section will not repeat some of the same information in this EA.

## 3.1 Water Resources

### 3.1.1 Affected Environment

#### 3.1.1.1 Cross Valley Contractors

CV contractors are CVP contractors that are geographically located within the Friant Division. A narrative description of the CV contractors can be found in Appendix C. In summary, there are seven CV contractors with a total CVP supply of 128,300 AF/y. One of the CV contractors, the County of Tulare, has 10 subcontractors which are identified in Table 2. The County of Tulare is in the process of assigning a portion of the contract to each of these subcontractors. Annual CV contractors' supply allocations are based on Reclamation's South-of-Delta CVP allocations, which are a percentage of each CVP contractors' respective contract total (Table 2). Allocations are based on available water supplies, meeting Delta water quality, environmental and flow requirements, and pumping capacity as well as other hydrologic and operational factors. Additionally, DWR pumps the CV contractors' Delta supplies after all other needs of the SWP have been met. The CVP water is subordinate in priorities for pumping by DWR. Water deliveries to the CV contractors are made available, by Reclamation, in the Delta and are diverted through the Banks Pumping Plant of the SWP or the Jones Pumping Plant of the CVP.

In 1975, the CVC was completed to bring water from the Aqueduct near Taft, California, through a series of six pump lifts to the east side of the SJV near the city of Bakersfield. Delta CV contractors CVP water supply was designed to be delivered to AEWS in exchange for a portion of their Friant Division CVP water supply available through Millerton Lake. Recently, Pixley Irrigation District and Lower Tule River Irrigation District have discontinued the exchange with AEWS and have transferred their CVP water to other CVP water districts and purchased local supplies.

CV contractors have a limited capability to receive Delta water directly from the CVC. Due to the above, exchanges between the CV contractors and other water districts may include compensatory arrangements for water imbalances due to the hydrological conditions, the time of

year the water is delivered, and value of such water. These exchange arrangements under Article 5(a) are not water transfers subject to Section 3405(a) of the CVPIA. (The specific Article 5 language can found in Appendix A.)

<b>Table 2. List of Cross Valley Contractors and their Related Water Resources</b>				
<b>Agency</b>	<b>CVP Contract Supply (AF/y)</b>	<b>Other Water Supplies</b>	<b>Groundwater Safe Yield</b>	<b>Groundwater Recharge</b>
County of Fresno County of Fresno Fresno County Service Area 34 (Brighton Crest)	<b>3,000 Total</b> 1,608 (M&I) 1,392 (M&I)	Unknown	*	Yes
County of Tulare Alpaugh Irrigation District Atwell Island Water District Hills Valley Irrigation District Saucelito Irrigation District Stone Corral Irrigation District City of Lindsay Fransinetto Farms Strathmore Public Utility District Styrotek, Inc. City of Visalia	<b>5,308 Total</b> 100 (Ag) 50 (Ag) 2,913 (Ag) 100 (Ag) 950 (Ag) 50 (M&I) 400 (Ag) 400 (M&I) 45 (M&I) 300 (M&I)	Groundwater	*	Yes
Hills Valley Irrigation District	3,346 (Ag)	Unknown	*	Yes
Kern-Tulare Water District	53,300 (Ag)	23,000 AF/y Kern River exchanged with ID4 for SWP water	*	Not within service area boundary
Lower Tule River Irrigation District	31,102 (Ag)		*	Yes
Pixley Irrigation District	31,102 (Ag)		*	Deer Creek
Tri-Valley Water District	1,142 (Ag)		*	No
<b>Totals</b>	<b>128,300</b>		-	-
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land. M&I – used for municipal and industrial purposes Ag – used for agricultural/irrigation purposes ID4 – Kern County Water Agency Improvement District 4				

### 3.1.1.2 Friant Division CVP Contractors and non-CVP Contractors

Friant CVP contractors are located on the eastern side of the SJV. CVP water for these contractors comes from Millerton Lake via the FKC or the Madera Canal. Water conveyed to these contractors is categorized as Friant Class 1 or Class 2 water depending on its reliability and allocation circumstances. A narrative description of Friant Division CVP contractors that are potential exchange partners can be found in Appendix D.

On March 1, 2010, Kaweah Delta Water Conservation District (KDWCD) received a partial assignment of 7,400 AF/y of Class 2 and 1,200 AF/y of Class 1 CVP water from Ivanhoe Irrigation District, and is now considered a Friant Division CVP contractor. KDWCD is located

in the south-central portion of the San Joaquin Valley and lies in both Tulare and Kings Counties with a total area of about 337,000 acres. KDWCD is comprised of four districts that are entirely or partially within KDWCD boundary: Lakeside Irrigation Water District, Kings County Water District, Corcoran Irrigation District, and Tulare Irrigation District (Table 6). Nearly all of the lands within KDWCD served with Kaweah River water also use groundwater wells to supply irrigation water, primarily due to the erratic, relatively undependable, nature of flow on the Kaweah River. All M&I water uses within the KDWCD are supplied from groundwater. KDWCD can take delivery of CVP water from the FKC, which passes through the eastern portion of the district.

In summary, there are 29 Friant Division CVP contractors; however, only 20 have been identified as potential exchange partners for the purposes of this EA (Table 3).

<b>Table 3. Potential Exchange Partners and Related Water Resources Information</b>					
<b>Friant Division CVP Contractors</b>	<b>Class 1 (AF/y)</b>	<b>Class 2 (AF/y)</b>	<b>Other Surface Water Supplies</b>	<b>Groundwater Safe Yield</b>	<b>Groundwater Recharge</b>
Arvin-Edison Water Storage District	40,000	311,675	Kern River	89,900	Yes
Delano-Earlimart Irrigation District	108,800	574,500	0	*	White River Channel
Exeter Irrigation District	11,500	19,000	0	*	Yokohl Creek
Fresno Irrigation District	0	75,000	Kings River 800,000	*	Yes
Garfield Water District	3,500	0	0	*	Unknown
Ivanhoe Irrigation District	6,500	500	Wutchumna Water Company Stock (3,950) St. Johns River, Cotton Creek	*	St. Johns River and Cotton Creek
Kaweah Delta Conservation District	1,200	7,400			
Lewis Creek Water District	1,450	0	0	*	Unknown
Lindmore Irrigation District	33,000	22,000	0	21,000	Yes
Lindsay-Strathmore Irrigation District	27,500	0	Wutchumna Water Company Stock 5-45,000	18,000	Unknown
Lower Tule River Irrigation District	61,200	238,000	Tule River 70,000; 31,102 CV	*	Unknown
Orange Cove Irrigation District	39,200	0	0	28,000	Only Small Amount in some Areas
Porterville Irrigation District	16,000	30,000	Tule River 12,900 Average, Porter Slough	0	No
Saucelito Irrigation District	21,200	32,800	0	*	Deer Creek only when CVP water is diverted from FKC
Shafter-Wasco	50,000	39,600	0	*	0

Irrigation District					
Southern San Joaquin Municipal Utility District	97,000	50,000	0	0	Poso Creek
Stone Corral Irrigation District	10,000	0	950 via exchanges with other CVP contractors	*	Unknown
Tea Pot Dome Water District	7,500	0	0	0	0
Terra Bella Irrigation District	29,000	0	0	0	Deer Creek
Tulare Irrigation District	30,000	141,000	0	0	0
<b>Other Potential Exchange Partners: non-CVP Contractors</b>					
Buena Vista Water Storage District	Kings County Water District				
Cawelo Water District	Kings River Conservation District				
Consolidated Irrigation District	Lakeside Irrigation District				
Corcoran Irrigation District	Liberty Water District				
Deer Creek & Tule River Authority	North Kern Water Storage District				
Kern County Water Agency	Kern Water Bank Authority				
Kern Delta Water District	Semitropic Water Storage District				
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.					

A narrative description of other CVP contractors and non-CVP contractors that are potential exchange partners can be found in Appendix E and Tables 4 through 9. Some of these districts have sub-entities which may include CVP and/or SWP contractors. In some cases, the diversions of non-CVP water from rivers, creeks and ditches, is based on the total runoff in any given hydrological season. The districts receive a percentage of the runoff and no specific limit exists to the total annual supply. The total amount of non-CVP water is difficult to quantify; therefore, average water supplies are depicted.

Table 4. Tulare Lake Basin Water Storage District Water Resources	
Contractor/Subcontractor	Water Resources
Tulare Lake Basin Water Storage District	Kings, Tule, Kaweah, and Kern Rivers, Deer Creek, SWP supplies
Angiola Water District	605 AF/y SWP, if available 15,000 AF/y (5,145 average) Kings River 6,000 AF/y (975 average) Tule River and Deer Creek 60,000 AF/y (7,787 average) Tulare Lake Flooding 35,000 AF/y groundwater
Melga Water District	SWP supplies and Kings, Tule, Kaweah, and Kern Rivers

Table 5. Deer Creek & Tule River Authority Water Resources					
Contractor/Subcontractor	CVP Supply (AF/y)		Other (AF/y)	Groundwater Safe Yield	Groundwater Recharge
	Friant	CV			
Lower Tule River Irrigation District	61,200 Class 1 238,000 Class 2	31,102	70,000 Tule River	*	Unknown
Pixley Irrigation District	0	31,102	Deer Creek	*	Deer Creek
Porterville Irrigation District	16,000 Class 1 30,000 Class 2	0	12,900 avg Tule River,	0	Yes

			Porter Slough		
Saucelito Irrigation District	21,200 Class 1 and 32,800 Class 2	100		*	Deer Creek (when CVP water is available)
Stone Corral Irrigation District	10,000 Class 1	0	950 CVP exchanges with other CVP contractors	3,200 AF/y	Unknown
Terra Bella Irrigation District	29,000 Class 1	0	0	0	Deer Creek
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.					

Table 6. Kaweah Delta Water Conservation District Water Resources					
Contractor/Subcontractor	CVP Supply (AF/y)		Other	Groundwater Safe Yield	Groundwater Recharge
	Friant	CV			
Lakeside Irrigation Water District	0	0	Kaweah and Kern Rivers, Cottonwood and Cross Creeks	*	Cross Creek recharge basins
Corcoran Irrigation District	0	0	Kings River	*	Yes
Kings County Water District	0	0	Kaweah and Kings Rivers	*	Yes
Tulare Irrigation District	30,000 Class 1 141,000 Class 2	0	Kaweah River	10% natural and artificial recharge	Yes
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.					

Table 7. Kern County Water Agency Water Resources				
Member Unit	CVP <sup>2</sup>	Other	Groundwater Safe Yield	Groundwater Recharge
Belridge Water Storage District <sup>1</sup>	No	SWP	n/a	None
Berrenda Mesa Water District <sup>1</sup>	No	SWP	n/a	None
Buena Vista Water Storage District	Yes	SWP, Kern River	0.3 AF	Yes
Cawelo Water District	Yes	45,000 AF/y SWP, Wet years only SWP, 27,000 AF/y Kern River, reclaimed oil field water	0.3 AF/acre	Limited Poso Creek, recharge basins
Henry Miller Water District <sup>1</sup>	Yes	SWP, Kern River	0.3 AF/acre	Limited
Improvement District #4	Yes	SWP, Kern River	0.3 AF/acre	Yes
Kern Delta Water District	Yes	Kings and Kaweah River	0.3 AF/acre	Yes
Lost Hills Water District <sup>1</sup>	No	SWP	n/a	None
North Kern Water Storage District	Yes	SWP, Kern River	0.3 AF/acre	Yes

Rosedale-Rio Bravo Water Storage District	Yes	SWP, Kern River	0.3 AF/acre	Yes
Semitropic Water Storage District	Yes	SWP, Poso Creek, Metropolitan Water District	0.3 AF/acre	Limited
Tehachapi-Cummings Company Water District <sup>1</sup>	No	SWP, local streams	*	Yes
Tejon-Castaic Water District <sup>1</sup>	No	SWP, local streams	n/a	None
West Kern Water District	No	SWP	n/a	None
Wheeler Ridge-Maricopa Water Storage District	No	SWP, local streams	*	Unknown

\*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.  
<sup>1</sup>Outside the CVP authorized Place-of-Use and excluded from this EA and approval process.  
<sup>2</sup>Surplus CVP flood water (215 Water) when available.

<b>Table 8. Kern Water Bank Authority Water Resources</b>				
<b>Contractor/Subcontractor</b>	<b>CVP<sup>2</sup></b>	<b>Other</b>	<b>Groundwater Safe Yield</b>	<b>Groundwater Recharge</b>
Dudley Ridge Water District	No	SWP	*	Yes
Kern County Water Agency	Yes	SWP, Kern River	*	Yes
Semitropic Water Storage District	Yes	SWP, Poso Creek	*	Yes
Tejon-Castaic Water District <sup>1</sup>	No	SWP	*	Yes
Westside Mutual Water District	Yes	SWP	*	Yes
Wheeler Ridge-Maricopa Water Storage District	No	SWP, local streams	*	Yes

\*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.  
<sup>1</sup>Outside the CVP authorized Place-of-Use and excluded from this EA and approval process.  
<sup>2</sup>Surplus CVP flood water (215 Water) when available.

<b>Table 9. Kings River Conservation District Water Resources</b>				
<b>Contractor/Subcontractor</b>	<b>CVP</b>	<b>Other</b>	<b>Groundwater Safe Yield</b>	<b>Groundwater Recharge</b>
Alta Irrigation District	No	Kings River	*	*
Clark's Fork Reclamation District No. 2069	No	Kings River	*	*
Consolidated Irrigation District	Yes <sup>2</sup>	Kings River	*	Yes
Corcoran Irrigation District	No	Kings River	*	*
Empire West Side Irrigation District	No	Kings River, SWP	*	*
Fresno Irrigation District	Yes <sup>2,3</sup>	Kings River	*	*
James Irrigation District	Yes <sup>2,3</sup>	CVP via exchange for Kings River	*	*
Kings County Water District	Yes <sup>2</sup>	SWP, Kings and Kaweah Rivers	*	*
Kings River Water District	Yes <sup>2</sup>	Kings River	*	*
Laguna Irrigation District	Yes <sup>2</sup>	Kings River	*	*
Lakeside Irrigation Water District	Yes <sup>2</sup>	Kings and St. Johns Rivers, Cross Creek	*	Cross Creek, recharge basin
Liberty Water District	Yes <sup>2</sup>	Kings River	*	Liberty Canal, recharge basin

Mid-Valley Water District	No	Kings River	*	*
Raisin City Water District	No	Kings River	*	*
Riverdale Irrigation District	No	Kings River	*	*
Salyer Water District	No	n/a	*	*
Stratford Irrigation District	No	Kings River	*	*
Tranquillity Irrigation District	Yes <sup>2,3</sup>	CVP via exchange for Kings River	*	*
Tulare Lake Reclamation District No. 761	No	Kings River, SWP	*	*
Burrel Ditch Company	No	Kings River	*	*
Crescent Canal Company	No	Kings River	*	*
John Heinlen Mutual Water Company	No	Kings River	*	*
Last Chance Water Ditch Company	No	Kings River	*	*
Lemoore Canal and Irrigation Company	No	Kings River	*	*
Liberty Mill Race Company	No	Kings River	*	*
Lovelace Water Corporation	No	Kings River	*	*
People's Ditch Company	No	Kings River	*	*
Reed Ditch Company	No	Kings River	*	*
Southeast Lake Water Company	No	Kings River	*	*
Stinson Canal and Irrigation Company	No	Kings River	*	*
Tulare Lake Canal Company	No	Kings River	*	*
Upper San Jose Water Company	No	Kings River	*	*
*The safe groundwater yield is difficult to quantify. However, the safe yield of groundwater is generally considered to be 1 AF of water for every 1 acre of land.				
<sup>1</sup> Outside the CVP authorized Place-of-Use and excluded from this EA and approval process.				
<sup>2</sup> Surplus CVP flood water (215 Water) when available.				

### 3.1.1.3 Groundwater Resources

The usable storage capacity has been estimated to be approximately 24 million AF for the San Joaquin River Hydrologic Region and 28 million AF for the Tulare Lake Hydrologic Region, which are the two hydrologic regions overlain by the CV contractors and most of the potential exchange partners. DWR estimated a level of groundwater extraction that would not lower groundwater levels over the long-term (perennial yield) to be approximately 3.3 million AF for the San Joaquin River Hydrologic Region. The perennial yield is 4.6 million AF for the Tulare Lake Hydrologic Region. This perennial yield is directly dependent upon the amount of recharge received by the groundwater basin. Recharge of the semi-confined aquifer in the regions is primarily derived from seepage from streams and canals, infiltration of applied water, and subsurface inflow. Most of the districts listed previously in this section include recharge facilities and groundwater resources. Precipitation on the valley floor provides some recharge, but only in abnormally wet years. Seepage from streams and canals is highly variable depending upon annual hydrologic conditions.

Water districts and landowners located within suitable groundwater basins routinely balance irrigation demands with surface and groundwater through conjunctive use. In wet years the groundwater is recharged and in dry years groundwater is extracted. Water districts and landowners located in areas with little to no groundwater sources would seek surface water supplies to purchase if a deficit in water supplies occurs. In most cases, the water districts do not have authority over the groundwater usage. Groundwater is pumped from privately owned wells and is not under the control of the water district. The water districts strive to provide surface

water, when available, at affordable prices to curb groundwater pumping. The groundwater levels, supplies and safe yield are difficult to quantify. This is due to the variances in soils types, proximity of the districts to the foothills, or water table gradients which results in groundwater flowing into and out of the aquifer underneath districts. Generally, the groundwater safe yield is approximately 1 AF per acre of land. In some years and due to the hydrogeology underlying a specific district the safe yield may be 0 AF. It is not uncommon for two water districts to enter into agreements for exchanges or transfers of surface water to off-set groundwater migration between the two districts. Water districts and landowners with suitable groundwater basins routinely balance irrigation demands with surface and groundwater through conjunctive use. In wet years the groundwater is recharged and in dry years groundwater is extracted.

The CVP was developed as a supplemental supply of surface water and to alleviate groundwater overdraft conditions. The overdraft of groundwater is a region-wide problem throughout the lower SJV and although ameliorated to some extent by the import of surface water, all hydrologic basins in the SJV continue to be overdrafted.

#### **3.1.1.4 Conveyance Facilities and Waterways**

Facilities and waterways involved with the exchanges include: the Banks and Jones Pumping Plants; FKC; Aqueduct; CVC; Kern Water Bank Canal; O'Neill Forebay; Kings, St. Johns, Tule, Kaweah and Kern Rivers; and small local creeks and streams. Since the exchanges would not involve any modifications to these existing facilities and waterways, and to the extent possible a change in normal operations, detailed background information for each of these facilities and waterways have been removed from this section and included in Appendix F.

In addition to the waterways listed above, the exchange partners have constructed extensive water conveyance systems to provide water throughout their service areas in order to provide water where it is needed.

### **3.1.2 Environmental Consequences**

#### **3.1.2.1 No Action Alternative**

**Surface Water** There may be negative impacts to water resources within the CV contractor's service areas under the No Action Alternative. No new supplies of water would be generated as the same amounts of water that have historically been pumped would continue and no additional water supplies would be diverted from reservoirs or rivers. The CVPIA PEIS and the corresponding BO for the continued long-term operation of the CVP and SWP assumed the 128,300 AF/y of water would be diverted, pumped from the Delta and conveyed every year; however, exchange volumes may be reduced. Contract deliveries and exchanges have been occurring annually since the mid 1970s. Therefore, the impacts to environmental resources have already been assessed for the O&M activities of the CVP and SWP and are part of the No Action Alternative.

Reclamation would prepare separate environmental documents each instance an Article 5 exchange is proposed to examine the impacts to environmental resources beyond the diversions, pumping and conveying of this water in CVP and SWP facilities. The timing for preparation of environmental and administrative review could exceed the window of opportunity for the

exchange resulting in reduced flexibility in the management of the CV contractor's CVP water in order to compete with neighboring farmers. The No Action Alternative would likely result in increases of water transfers and higher prices for the CV contractors. The potential exchange partners may not receive the benefit of the additional water supplies for beneficial uses including growing higher value crops, groundwater recharge, groundwater banking or transfers. Less water may be available in the SJV if the exchange requests are not approved and CVP water is not conveyed under Article 55. However, the CV contractors could continue to exchange water with AEWS D to the extent possible.

**Groundwater** The No Action Alternative is a continuation of exchanges between the CV contractors and AEWS D, as in the past. AEWS D is located in Kern County and exchange arrangements could result in temporary increases to the local groundwater as in the past.

Reclamation could still approve exchange arrangements between the CV contractors and other exchange partners but only after completing environmental and administrative review. The separate environmental reviews could exceed time frames for approvals for the exchanges since DWR has a short window of opportunity to pump and convey this water. Therefore, the exchange partners may not have the benefit of using this water for groundwater recharge or banking this water for later use during dry seasons to benefit the overdraft conditions in the SJV. The No Action Alternative could result in the CV contractors pumping groundwater or extracting groundwater from banking facilities if adequate surface water supplies are not available for purchase or exchange opportunities are limited. Continued groundwater pumping from areas of overdraft would exacerbate existing conditions.

Exchanges with AEWS D from multiple CV contractors are only feasible when there is a relatively large Class 2 declaration so that AEWS D has adequate supplies to exchange. AEWS D only has a Class 1 supply of 40,000 AF/y.

### **3.1.2.2 Proposed Action**

**Surface Water** The 128,300 AF/y of water involved in the exchanges are supplies already allocated and no additional water supplies would be diverted from rivers or lakes. No new construction or points of diversions would be required. However, changes in timing and locations of when and where water is diverted could occur. The rivers in the project area are managed for flood control and irrigation similar to canals.

Releases from the dams occur in response to high water flows or to meet irrigation demands and minimum flow requirements to benefit fish, wildlife and recreational uses. Typically, minimum flow requirements are maintained while the hydrological conditions dictate the amount of water diverted to meet irrigation demands. Telemetric systems are used to record flows and the watermasters coordinate with the water districts to open or close their gates for diversions of water on a real-time basis to ensure appropriate flows are maintained throughout the course of the rivers. The timing and locations of diversion vary from year-to-year due to hydrological conditions, fluctuating marketing conditions, transfers and/or exchanges of water with or without the proposed Article 5 exchanges. The Proposed Action would not result in adverse impacts to third parties, water quality, quantity, flows or temperature. In addition, the exchange

arrangements would not interfere with deliveries to other water purveyors or meeting minimum flow requirements for both the SWP and CVP.

The Proposed Action would not result in deliveries of additional water supplies from new sources or origins of water. The maximum amount of water exchanged would be up to 128,300 AF/y and would be comingled in the conveyance facilities. Deliveries of water supplies in the conveyance facilities occur within the capacities and operations of the canals although the destination and label on the water may differ. Utilization of SWP and CVP facilities and the CVC would be scheduled and coordinated with the overseeing agency to ensure that the normal operations of said facilities would not be adversely impacted.

Changes in water flows or temperatures in the canals and Aqueduct would not result in significant impacts to water quality or quantity. The O&M of the CVP and SWP were addressed in the CVPIA PEIS and BO for the continued long-term operation of the CVP and SWP included the entire 128,300 AF/y of the CV contractor's water supplies. This water was assumed to be pumped and conveyed in each year for deliveries via exchanges to the CV contractors. The proposed Article 5 exchanges would not result in any impacts to diversion from the Delta or pumping and conveyance of this water beyond those already addressed in the CVPIA PEIS and the BO for the continued long-term operation of the CVP and SWP.

This EA addresses the conveyance of the CV contractor's CVP water under Article 55 of the SWP contracts when combined with Article 5(a) of the CVP contracts. The conveyance of CVP water under Article 55 could result in the CV contractors receiving a higher rank on the SWP hierarchy for pumping. Pumping and conveying water under Article 55 does not result in additional water conveyed. Reclamation policy limits the amount of CV contractors supplies conveyed under Article 55 to be that of each CV contractors' SOD allocation to prohibit impact to the CVP as whole which has a lower joint-point-of-delivery priority than CV contractors have. DWR would pump this amount of water with or without the Proposed Action with others. The proposed exchanges, pumping, conveyance, and approvals are subject to applicable laws and policies including the Reclamation's policy that decisions made would not harm other CVP contractors. No adverse changes in water quantities, diversions, pumping or conveyance practices would occur.

Historically, the untimely delivery of CV contractor water has resulted in AEWS D receiving the water when its value is low. This same amount of water is of much higher value at such time this water is exchanged back to the CV contractors due to timing and demands. The value and timing of the water is considered in exchange agreements between the parties. Therefore, the CV contractors are seeking to enter into exchange arrangements that will benefit AEWS D and/or others in order to obtain water at a reasonable price for the CV contractors' landowners to compete with other agricultural growers. In lieu of paying a higher price for the water when it is exchanged to the CV contractors, the exchange arrangements commonly allow for an imbalanced exchange of the CV contractors' water supplies to compensate for the value of the water when it is delivered. Similar exchange arrangements are anticipated for the "other" exchange partners. The exchange arrangements are developed between willing buyers and sellers with mutually agreeable terms. A portion of the water (up to 50 percent) would be retained by the exchangee and 50 percent would be delivered to the CV contractor when it is needed.

Under the Proposed Action, the water management practices for the CV contractors would not change dramatically. CV contractors may receive between 100 and 50 percent of their CVP supply when it is needed. The CV contractors would receive the benefit of having lower priced water with deliveries on a demand schedule to allow for advanced planning and growing of crops on existing agricultural lands in order to compete with neighboring farmers. However, the availability of this water is contingent upon DWR having a window of opportunity to pump the water.

Under the Proposed Action, the exchange partners could potentially receive an increase of no more than 64,150 AF of water as a result of imbalanced exchanges. This water could be used to grow higher value crops, groundwater recharge, banking for later use in dry years, subsequent transfers within the Place-of-Use including selling to the Environmental Water Account and/or municipal and industrial uses. The increase of 64,150 AF is small (approximately 2 percent) compared to the over 3 million AF/y of the overall water supplies for the water purveyors and would not lead to significant impacts to surface water quality or quantity. The same amount of water would continue to be utilized within the lower SJV for beneficial uses. Subsequent transfers, recipients of the banked water, changes in the places or purpose of the use of the water would require environmental review, and compliance with the Reclamation Reform Act, water rights permits and applicable federal, state and local laws prior to approval. Reclamation does not have jurisdiction over non-CVP supplies.

Under the Proposed Action, the exchanger(s) could receive less water than their full contract supply and allocation. However, receiving a reduced amount of water versus supplies outside of the growing season would provide better use and management of this water. This reduction would not result in major impacts for the exchanger(s) since their water supplies are intermittent and unreliable.

**Groundwater** The SJV is in overdraft conditions. A portion of the water applied on irrigated lands seeps into the groundwater. However, groundwater seepage is slow and would not lower the expense of pumping groundwater. The water districts strive to provide surface water at affordable prices to discourage groundwater pumping. The Proposed Action could provide short-term relief to groundwater quality and quantity.

The Proposed Action would not result in noticeable reductions of water supplies in the CV contractors' service areas since this water has been delivered on an intermittent basis in the past. Kern Tulare Water District, Alpaugh Irrigation District and Atwell Water District are located in areas with inadequate groundwater supplies and unsuitable for groundwater recharge or in-district banking. Due to the availability of groundwater storage facilities in Kern County, it is likely that water districts located in the Kern County Basin would become exchange partners with the CV contractors. Therefore, it is likely groundwater quality and quantity would improve temporarily in Kern County. The groundwater is typically stored and extracted when surface water supplies are unavailable and distributed to the "owners" of the storage space in the groundwater banking facilities. The Proposed Action would provide an increase of water to areas suitable for groundwater recharge providing an improvement of managing available water supplies and overall benefit to the region-wide overdraft conditions until the water is extracted in

dry years. Therefore, the Proposed Action would not result adverse impacts to groundwater quality or quantity.

**Cumulative Impacts** The Proposed Action would not contribute to, or inhibit, the renewal of CVP long-term contract renewals for other CVP contractors. The CVPIA envisioned improved water management options and expanded the opportunities for transfers to occur to encourage efficient water management and conservation. Transfers of CVP water require approval by Reclamation’s Contracting Officer. Transfers of CVP water undergo a rigorous checklist to determine whether there are any immitigable third party impacts, as well as a public review period under NEPA and Section 3405(a) of the CVPIA. CVP water transfers outside the respective places of use or changes in points of diversions require prior approval by the State Water Resources Control Board. Reclamation does not have approval authority over transfers of non-CVP water. Under State law, transfers are prohibited if they would result in unmitigated third party impacts regardless of the type of water rights held by the seller. SWP contractors are restricted under Table A and the Monterey Agreement to transfer SWP water. DWR manages a ‘Turn Back Pool’ for SWP contractors who do not need to deliver all of their SWP water supplies and DWR redistributes this water. Riparian water rights are restricted to use of the water that can be reasonably used on those lands appurtenant to stream courses and transfers are prohibited. Transfers out of the Kaweah Basin are not permitted without proper consent with the Kaweah Basin water interests. All “out of basin” transfers are reviewed for applicable laws prior to approvals.

The reservoirs, rivers and creeks in the lower SJV associated with the Proposed Action are managed for flood control and agricultural supplies. Diversions of water occur based on the hydrological and environmental conditions. During wet seasons and high water flows, surplus water supplies are released and, if possible, marketed to quickly disperse this water to avoid flooding and damage downstream in the rivers. The Proposed Action would not interfere with deliveries, operations or cause significant adverse changes to the rivers, creeks or conveyance facilities associated with the SWP or CVP. The conveyance facilities and river systems in the lower SJV are interconnected and allow for a myriad of transfers, exchanges, contract assignments, and conveyances of water via Warren Act contracts, Operational Contracts or Article 55 of the SWP. The conveyance of water under these water service options are subject to available capacity, meeting primary requirements, and environmental reviews.

It is recognized the exchange partners could take deliveries of their other water supplies in addition to receiving the 64,150 AF/y of CVP water. The use of CVP water within the exchange partners’ service areas could result in other sources of water freed up, of which, Reclamation does not have approval authority. The freed up water supplies could be sold providing a financial benefit to the exchange partner. The U.S. Corps of Engineers has increased the capacity of Lake Kaweah, which is created by Terminus Dam on the Kaweah River. The dam enlargement project would raise the gross pool by 21 ft and add 42,600 AF of flood storage space in Lake Kaweah. The plan would increase the levels of flood protection to the 70-year event for downstream communities and the 3.2-year event for the Tulare lakebed. An additional average annual irrigation water supply of 8,400 AF could be stored in the reservoir. (Kaweah River Basin Investigation and Draft Environmental Impact Statement, Corps 1999). The Proposed Action is unrelated to the project modifications and would not contribute to or hinder

decisions to the enlargement project. The spillway modification project increases water supplies for agricultural or marketing purposes. Transfers of Kaweah River water supplies outside of the Kaweah Basin are currently prohibited with the exception of high flood flows. The Proposed Action, when added to the modification to the lake enlargement project, would not increase or decrease water allocations and would not contribute to cumulative effects to rivers or reservoirs. The Proposed Action would not contribute to or interfere with flood control management and operations. The Proposed Action and imbalanced exchanges would not increase or decrease the availability of flood water nor inhibit or contribute to decisions to accept or reject this source of water.

Kern County Water Agency and CV contractors prepared an Environmental Impact Report under CEQA (SCH #2004-81183) for the expansion of the CVC (KCWA 2005). The objective of the CVC expansion project is to capture high water flows (surplus water). The CVC was increased by 500 cfs. This water is available on a short-term and unreliable basis. The CVC expansion project would allow this water to be conveyed in the CVC and delivered to groundwater banks for later use in dry seasons. The CVC enlargement project includes additional pumps and turnouts for deliveries of this water to groundwater banks. In wet years, the project would allow for water to be conveyed and recharged along both sides of the Kern River. In dry years the stored groundwater will be recovered through a series of operationally linked groundwater recovery wells. The expansion project would not change capacity in the FKC to allow for more water to be backed up to the CV contractors. The expansion project would not change pumping or diversions of water from the Delta to improve water supplies to the CV contractors. The CVC expansion project would have occurred with or without the proposed Article 5 exchanges. The Article 5 exchanges when added to the expansion project would not result in adverse cumulative impacts.

The North Kern Water District is also constructing a pipeline to its groundwater facilities to accommodate the surplus water, when available. The turnout facilities could result in improved capabilities for the Article 5 exchanges water to be conveyed to the existing groundwater bank facilities; however, would occur with or without the Proposed Action. The turnouts may reduce the need to pump the exchange water over longer distances providing a financial benefit to the water districts and benefit to power users. The CV contractor's water has historically been conveyed across the length of the CVC to AEWSD and would not contribute to adverse cumulative impacts.

Kern-Tulare Water District has completed the approval process for two separate groundwater banking projects with Rosedale-Rio Bravo Water Storage District and North Kern Water Storage District. The main source of water for the banking projects is surplus CVP water, when available. Kern-Tulare Water District does not have adequate groundwater storage capacity. It is possible the Article 5 exchange water would be banked in these facilities until such time Kern-Tulare Water District needs this water. The Article 5 exchanges, when added to the groundwater banking projects would not contribute to adverse cumulative impacts to water resources.

In recent years, other exchanges between CV contractors and CVP contractors or other water entities have undergone environmental reviews and short-term approvals. It is anticipated these other exchanges would occur over the term of the CV contractors' future water service contracts.

In past interim contracts, Reclamation allowed for exchange arrangements to be pursued with others as well as with AEWS.

## **3.2 Land Use**

### **3.2.1 Affected Environment**

A narrative of the land uses in the water districts involved with the exchanges are contained in the incorporated documents and in Appendices C thru E. Generally, the land use is mainly comprised of irrigated agriculture. Cities along the Highway 99 corridor are expected to expand over the next years. These cities include Fresno, Visalia, Delano and Bakersfield.

### **3.2.2 Environmental Consequences**

#### **3.2.2.1 No Action**

Under the No Action Alternative, available water supplies would be applied to existing agricultural lands. Decisions to fallow lands would be based on available water supplies, hydrological conditions, constraints of water deliveries, and fluctuating agricultural marketing strategies. Due to reduced water supplies if exchange arrangements were not in place, there may be a small reduction in farmed acres.

#### **3.2.2.2 Proposed Action**

Land use would not change under the Proposed Action. The CV contractors have managed their water supplies to meet demands in the past when DWR has not had the opportunity to pump the water. Receiving a reduced supply of water when DWR has the opportunity would not result in adverse changes in cropland production since an increment of this water would be provided by the exchange partner to the CV contractor during the irrigation season.

Although it is possible the exchange partners could potentially receive an increase of no more than 64,150 AF of water, this would occur only in years when DWR has a window of opportunity to pump this water or when Article 55 conveyance arrangements are utilized. The conveyance of water under Article 55 is subject to capacity in the Aqueduct and meeting all SWP requirements. Due to the unreliability and unavailability of this water, the Proposed Action would not lead to long-term land use changes. The water supplies are variable and do not provide a reliable or consistent amount for landowners to make long-term land use changes. No native grasslands or shrub land would be tilled or cultivated. Water would be delivered to established croplands and used for irrigation purposes on lands irrigated within the last three years or for existing M&I uses. Exchange arrangements that result in short-term imbalanced exchanges could result in short-term fallowing of lands until such time the water is delivered. Imbalanced exchanges may involve monetary compensation to allow purchases of other supplies.

The exchanges would occur within existing facilities. Exchanges requiring additional construction to convey this water are not within the scope of this EA and would undergo separate environmental review.

**Cumulative Impacts** The home prices in the lower SJV and project area are lower compared to other regions in California. This and other economical forces are driving factors for land use changes from agricultural to urban uses. These changes are long-term and require approvals from

the Local Area Formation Committee, changes in City or County General Plans and undergo environmental reviews. Changes in the CVP contractors' boundaries and service areas undergo environmental review under NEPA and approval by Reclamation. Boundary change requests from the CVP contractors for Reclamation's approval are often misconstrued. Reclamation does not have land use change approval authority. However, Reclamation must determine whether boundary change requests would result in inconsistency with the Reclamation Reform Act, water rights permits or other laws and regulations. During this determination and approval process, Reclamation evaluates any proposals for boundary changes as it relates to the use of the water and prepares environmental documents in accordance with NEPA prior to Reclamation's approval.

As stated earlier, a myriad of water service transactions routinely occur within the project area. The temporary fallowing of lands could occur especially during dry and drought seasons. The various water service transactions are for the efficient management of water resources and do not contribute to long-term or reliable water supplies that would result in land use changes. Providing affordable surface water to farmers could curtail urban sprawl. The population in California is expected to grow over the next couple decades. Land values are anticipated to increase as housing becomes scarce. These trends are expected to continue and could entice farmers to sell their lands. These conditions are likely to occur with or without the proposed exchanges.

The exchange water could be diverted through the facilities for the proposed groundwater banking projects for Kern Tulare Water District with Rosedale Rio-Bravo Water Storage District and North Kern Water Storage District. The CVC expansion project includes turnouts that could be used to divert the exchange water under the Proposed Action. The exchange water is unreliable and in some years is not pumped and conveyed. Therefore, the Proposed Action would not lead to decisions to construct additional groundwater facilities or contribute to major cumulative impacts to land uses.

### **3.3 Biological Resources**

#### **3.3.1 Affected Environment**

By the mid-1940s, most of the valley's native habitat had been altered by man, and as a result, was severely degraded or destroyed. Approximately 86 percent of the estimated four million acres of native wetlands in the Central Valley was converted to urban and agricultural uses between 1850 and 1985 (Service 1989). When the CVP began operations, over 30 percent of all natural habitats in the Central Valley and surrounding foothills had been converted to urban and agricultural land use (Reclamation 1999).

Prior to widespread agriculture, land within the Proposed Action area provided habitat for a variety of plants and animals. With the advent of irrigated agriculture and urban development over the last 100 years, many species have become threatened and endangered because of habitat loss. Of the approximately 5.6 million acres of valley grasslands and San Joaquin saltbrush scrub, the primary natural habitats across the valley, less than 10 percent remains today. Much of the remaining habitat consists of isolated fragments supporting small, highly vulnerable populations (Reclamation 2001). The project area is dominated by agricultural habitat that

includes field crops, orchards, and pasture. The vegetation is primarily crops and frequently includes weedy non-native annual and biennial plants.

The documents incorporated by reference contain a more detailed description of biological resources in the districts' service areas and boundaries. The CVP contractors have already undergone consultation with Service and NMFS and are implementing measures in the applicable BOs. Kern County Water Agency has an existing Habitat Conservation Plan for portions of its service area.

***Threatened, Endangered and Sensitive Species***

A list of endangered, threatened and sensitive species that may occur within the 7.5 minute United States Geological Survey quadrangles that underlie or touch the action area was obtained from the Service's Endangered Species Lists website: [http://sacramento.fws.gov/es/spp\\_list.htm](http://sacramento.fws.gov/es/spp_list.htm) on June 29, 2010 (document numbers: 100629114715 and 100629125543). The Service's database was last updated April 29, 2010. Additional data was obtained from the California Department of Fish and Game's California Natural Diversity Database. The list was compiled from the following counties: Contra Costa, Santa Clara, San Joaquin, Fresno, Kings, Kern, and Tulare.

<b>Table 11. Federally Listed, Threatened, and Endangered Species that may occur within the Proposed Action Area</b>			
<b>Common Name</b>	<b>Scientific Name</b>	<b>Federal Status</b>	<b>Critical Habitat</b>
Alameda whipsnake	<i>Masticophis lateralis euryxanthus</i>	Threatened	Designated
Antioch Dunes evening-primrose	<i>Oenothera deltoides</i> ssp. <i>howellii</i>	Endangered	Designated
Bakersfield cactus	<i>Opuntia treleasei</i> (= <i>Opuntia basilaris treleasei</i> )	Endangered	None
bay checkerspot butterfly	<i>Euphydryas editha bayensis</i>	Threatened	Designated
blunt-nosed leopard lizard	<i>Gambelia sila</i>	Endangered	None
Buena Vista Lake shrew	<i>Sorex ornatus relictus</i>	Endangered	Designated
California brown pelican	<i>Pelecanus occidentalis californicus</i>	Delisted	N/A
California clapper rail	<i>Rallus longirostris obsoletus</i>	Endangered	None
California condor	<i>Gymnogyps californianus</i>	Endangered	Designated
California jewelflower	<i>Caulanthus californicus</i>	Endangered	None
California least tern	<i>Sternula antillarum</i>	Endangered	None
California red-legged frog	<i>Rana draytonii</i>	Threatened	Designated
California tiger salamander	<i>Ambystoma californiense</i>	Threatened	Designated
callippe silverspot butterfly	<i>Speyeria callippe callippe</i>	Endangered	None
Central Valley spring-run chinook salmon	<i>Oncorhynchus tshawytscha</i>	Threatened	Designated
Central Valley steelhead	<i>Oncorhynchus mykiss</i>	Threatened	Designated
central California coast coho salmon	<i>Oncorhynchus kisutch</i>	Endangered	Designated
central California coast steelhead	<i>Oncorhynchus mykiss</i>	Threatened	Designated
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	Endangered	Designated
Contra Costa goldfields	<i>Lasthenia conjugens</i>	Endangered	Designated
Contra Costa wallflower	<i>Erysimum capitatum</i> ssp. <i>angustatum</i>	Endangered	Designated
Coyote ceanothus	<i>Ceanothus ferrisiae</i>	Endangered	None

Common Name	Scientific Name	Federal Status	Critical Habitat
fisher	<i>Martes pennanti</i>	Candidate	N/A
fleshy (=succulent) owl's-clover	<i>Castilleja campestris</i> ssp. <i>succulenta</i>	Threatened	Designated
Fresno kangaroo rat	<i>Dipodomys nitratooides exilis</i>	Endangered	Designated
giant garter snake	<i>Thamnophis gigas</i>	Threatened	None
giant kangaroo rat	<i>Dipodomys ingens</i>	Endangered	None
green sturgeon	<i>Acipenser medirostris</i>	Threatened	Designated
hairy Orcutt grass	<i>Orcuttia pilosa</i>	Endangered	Designated
Hartweg's golden sunburst	<i>Pseudobahia bahiifolia</i>	Endangered	None
Hoover's spurge	<i>Chamaesyce hooveri</i>	Threatened	Designated
Keck's checker-mallow (=checkerbloom)	<i>Sidalcea keckii</i>	Endangered	Designated
Kern mallow	<i>Eremalche kernensis</i>	Endangered	None
Kern primrose sphinx moth	<i>Euproserpinus euterpe</i>	Threatened	None
Lahontan cutthroat trout	<i>Oncorhynchus (=Salmo) clarki henshawi</i>	Threatened	None
Lange's metalmark butterfly	<i>Apodemia mormo langei</i>	Endangered	None
large-flowered fiddleneck	<i>large-flowered fiddleneck</i>	Endangered	Designated
least Bell's vireo	<i>Vireo belli pusillus</i>	Endangered	Designated
Little Kern golden trout	<i>Oncorhynchus mykiss (=aguabonita) whitei</i>	Threatened	Designated
longhorn fairy shrimp	<i>Branchinecta longiantenna</i>	Endangered	Designated
marbled murrelet	<i>Brachyramphus marmoratus</i>	Threatened	Designated
Mariposa pussy-paws	<i>Calyptridium putchellum</i>	Threatened	None
Metcalf Canyon jewelflower	<i>Streptanthus albidus</i> ssp. <i>albidus</i>	Endangered	None
Mountain yellow-legged frog	<i>Rana muscosa</i>	Candidate	N/A
Paiute cutthroat trout	<i>Oncorhynchus (=Salmo) clarki seleniris</i>	Threatened	None
pallid manzanita	<i>Arctostaphylos pallida</i>	Threatened	None
palmate-bracted bird's-beak	<i>Cordylanthus palmatus</i>	Endangered	None
riparian woodrat	<i>Neotoma fuscipes riparia</i>	Endangered	None
riparian brush rabbit	<i>Sylvilagus bachmani riparius</i>	Endangered	None
salt marsh harvest mouse	<i>Reithrodontomys raviventris</i>	Endangered	None
San Benito evening-primrose	<i>Camissonia benitensis</i>	Threatened	None
San Francisco garter snake	<i>Thamnophis sirtalis tetrataenia</i>	Endangered	
San Joaquin adobe sunburst	<i>Pseudobahia peirsonii</i>	Threatened	None
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	Endangered	None
San Joaquin Valley Orcutt grass	<i>Orcuttia inaequalis</i>	Endangered	Designated
San Joaquin woolly-threads	<i>Monolopia congdonii</i>	Endangered	None
Santa Clara Valley dudleya	<i>Dudleya setchellii</i>	Endangered	None
Santa Cruz tarplant	<i>Holocarpha macradenia</i>	Threatened	Designated
Sierra Nevada (=California) bighorn sheep	<i>Ovis canadensis californiana</i>	Endangered	None
soft bird's-beak	<i>Cordylanthus mollis</i> ssp. <i>mollis</i>	Endangered	Designated
south-central California coast steelhead	<i>Oncorhynchus mykiss</i>	Threatened	Designated
southwestern willow flycatcher	<i>Empidonax trailli extimus</i>	Endangered	Designated
Springville clarkia	<i>Clarkia springvillensis</i>	Threatened	None
Tiburon paintbrush	<i>Castilleja affinis</i> ssp. <i>neglecta</i>	Endangered	None
tidewater goby	<i>Eucyclogobius newberryi</i>	Endangered	None
Tipton kangaroo rat	<i>Dipodomys nitratooides nitratooides</i>	Endangered	None

Common Name	Scientific Name	Federal Status	Critical Habitat
valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	Threatened	Designated
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Threatened	Designated
vernal pool tadpole shrimp	<i>Lepidurus packardi</i>	Endangered	Designated
western snowy plover	<i>Charadrius alexandrinus nivosus</i>	Threatened	Designated
Yosemite toad	<i>Bufo canorus</i>	Candidate	N/A

The vernal pool species critical habitat around the County of Fresno Service Area #34 (CSA#34) consists of units designated for the following species: SJV Orcutt grass, vernal pool fairy shrimp, and fleshy (succulent) owl's-clover. Unit #2 of the South San Joaquin Region of California tiger salamander (CTS) critical habitat also overlaps CSA#34. There are 1,561 acres within the SSJ-2 unit for CTS, and 1,294 acres within the vernal pool units.

The Tri-Valley and Hills Valley Water Districts also are partially within CTS critical habitat. There are 243 acres of Tri-Valley and 792 acres of Hills Valley overlapped by the boundaries (for a total of 1,035 acres). There are 396 acres of the Stone Corral Irrigation District overlapped by the vernal pool critical habitat.

Contra Costa Water District's service area overlaps habitat and critical habitat for both the California tiger salamander and California red-legged frog. Contra Costa County and the Cities of Brentwood, Clayton, Oakley and Pittsburg are all participants in the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan, for which the Service has issued a 10(a)(1)(B) permit. Reclamation consulted on long-term contract renewal for CVP water for CCWD and the resulting BO is being implemented. Reclamation and CCWD do not approve inclusions into CCWD's service area for CVP without evidence of ESA compliance.

Santa Clara County and the SCVWD are participants in the Santa Clara County Habitat Conservation Plan/Natural Community Conservation Plan, which covers over 60% of the county and includes all of the southern and northern central areas, including part of the City of San Jose. The Habitat Conservation Plan/Natural Community Conservation Plan is still in draft form.

San Joaquin County is covered by the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan. This plan is final and the Service has issued a 10(a)(1)(B) permit. It covers the City of Tracy. The plan covers all the Service-administered terrestrial species, and there is limited coverage for the delta smelt. Species under NMFS' jurisdiction are not covered.

The critical habitat consists of undeveloped lands within these areas. Reclamation has determined that no delivery of CVP water to these lands would be allowed unless and until the landowner can demonstrate compliance with the ESA, including consultation with the Service, for the critical habitat.

Designated or proposed critical habitat for the Fresno kangaroo rat, California condor, vernal pool fairy shrimp, vernal pool tadpole shrimp, Hoover's spurge, San Joaquin Valley Orcutt grass, and CTS also occurs within the action area. The California condor, though extremely rare throughout its range, may occasionally forage over the action area. The Fresno kangaroo rat has

not been recorded in Fresno County since 1992 and may be extirpated from critical habitat within the action area. Vernal pool fairy shrimp critical habitat within the action area is restricted to a few locations in Kings and Tulare counties. Critical habitat for vernal pool tadpole shrimp, Hoover's spurge and San Joaquin Valley Orcutt grass within the action area is confined to a small number of areas in Tulare County. Six units of the proposed critical habitat for the CTS are located within or near the action area.

Habitat loss and degradation affecting animals and plants occurs within the action area and is projected to continue to affect special-status species in the southern SJV. However, actions taken by Reclamation, in concert with protections afforded by regional conservation plans such as the Metropolitan Bakersfield Habitat Conservation Plan and the Kern Water Bank Habitat Conservation Plan/Natural Community Conservation Plan, ameliorate such adverse effects and play a key role in achieving the goal of maintaining and preserving special-status species and their native habitats.

### **3.3.2 Environmental Consequences**

#### **3.3.2.1 No Action**

The No Action Alternative is similar to the Proposed Action. The same amounts of water would be diverted from rivers and reservoirs based on hydrological conditions. Deliveries would occur in existing facilities. The operations of the CVP and SWP would continue as in the past within constraints and limitations. Croplands would remain the same. Decisions to fallow or not fallow lands would be based on hydrological and agricultural marketing conditions. Reclamation could prepare separate EA reviews for each proposed exchange request. However, the timing for environmental reviews could exceed beyond the time constraints to implement an exchange arrangement.

#### **3.3.2.2 Proposed Action**

The aspect of the Proposed Action that is of concern, environmentally, is the potentially unbalanced nature of the exchanges. However, the net amount of water that could be delivered to an exchange partner would be temporary and would be applied to sustain existing agriculture and/or banked for groundwater recharge. The 128,300 AF/y of water that would be involved in the exchanges are supplies already allocated to the CV contractors and no additional water supplies would be diverted from rivers or lakes. No new construction or points of diversions would be required. However, slight changes in timing and locations of when and where water is diverted could occur. The rivers in the project area are managed for flood control and irrigation, so their use in the Proposed Action to convey water supplies would not be a change from current conditions. The Proposed Action would not result in any increase in the water level of Lake Isabella, because each entity that has storage in the reservoir cannot exceed their allowed AF amount. Any water not taken from Lake Isabella as a result of a district receiving water under the Proposed Action would have to be released if it would cause the allowed amount to be exceeded. Therefore, the least Bell's vireo and southwestern willow flycatcher would not be affected by any flooding of nests or habitat.

This EA also addresses the conveyance of CVP water under Article 55 of the SWP contracts when combined with Article 5(a) exchanges of the CVP contracts. The conveyance of CVP water under Article 55 could result in the CV contractors water receiving a higher rank on the

SWP hierarchy. Conveying water under Article 55 would not result in additional water conveyed. DWR would pump this amount of water although the label on the water and recipients may differ. The proposed exchanges, conveyance and approvals are subject to applicable laws including the “no injury” rule. Therefore, Article 55 of the SWP contracts would not affect federally listed species or critical habitats (i.e. there would be no effects beyond those addressed by the current biological opinions and biological assessment for the continued long-term operation of the CVP and SWP).

Due to the criteria for the Proposed Action, districts would not be able to expand their service areas, bring native or fallowed lands (fallowed for three years or more) into cultivation, or alter current environmental conditions without further environmental review and approval. Most of the species addressed in this EA are not adapted to highly disturbed conditions and are poor colonizers; mostly for that reason, they have declined to the point of becoming threatened or endangered. Typically, they would not become established on land that had been fallowed for two years or less and would not occur on land that is being cultivated or is highly disturbed. Furthermore, the Proposed Action is a short-term action, which further limits the chance that it would result in land use changes.

The few species that could occupy these lands are: the Buena Vista Lake shrew, San Joaquin kit fox, Tipton kangaroo rat, blunt-nosed leopard lizard, Kern mallow, San Joaquin woolly-threads, Western Burrowing Owl and Swainson’s hawk. As a result of the commitments made by all of the contractors involved in the proposed action, which include those from the LTCR Opinion, and in conjunction with the limitations of a short-term action, these species would not be affected. The amounts of water received by the CV contractors are only those covered under their contracts for CVP water. These commitments would also protect native lands, including those within two miles of the contractors’ service areas. These native lands include critical habitat for the Buena Vista Lake shrew, California condor, CTS, fleshy owl’s-clover, Hoover’s spurge, SJV Orcutt grass, vernal pool fairy shrimp, and the vernal pool tadpole shrimp.

**Cumulative Impacts** As the Proposed Action is not expected to result in any direct or indirect effects on special-status species (including Federally listed or proposed species) or any critical habitat; therefore, it would not contribute cumulatively to any effects on those resources.

### **3.4 Cultural Resources**

Cultural resources is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. The National Historic Preservation Act (NHPA) of 1966 is the primary Federal legislation that outlines the Federal Government’s responsibility to cultural resources. Section 106 of the NHPA requires the Federal Government to take into consideration the effects of an undertaking on cultural resources listed on or eligible for inclusion in the National Register of Historic Places (NRHP). Those resources that are on or eligible for inclusion in the NRHP are referred to as historic properties.

The Section 106 process is outlined in the Federal regulations at 36 Code of Federal Regulations (CFR) Part 800. These regulations describe the process that the Federal agency (Reclamation) takes to identify cultural resources and the level of effect that the proposed undertaking will have

on historic properties. In summary, Reclamation must first determine if the action is the type of action that has the potential to affect historic properties. If the action is the type of action to affect historic properties, Reclamation must identify the area of potential effects (APE), determine if historic properties are present within that APE, determine the effect that the undertaking will have on historic properties, and consult with the State Historic Preservation Office (SHPO), to seek concurrence on Reclamation's findings. In addition, Reclamation is required through the Section 106 process to consult with Indian Tribes concerning the identification of sites of religious or cultural significance, and consult with individuals or groups who are entitled to be consulting parties or have requested to be consulting parties.

### **3.4.1 Affected Environment**

The San Joaquin Valley is rich in historical and prehistoric cultural resources. Cultural resources in this area are generally prehistoric in nature and include remnants of native human populations that existed before European settlement. Prior to the 18<sup>th</sup> Century, many Native American tribes inhabited the Central Valley. It is possible that many cultural resources lie undiscovered across the valley. The San Joaquin Valley supported extensive populations of Native Americans, principally the Northern Valley Yokuts, in the prehistoric period. Cultural studies in the San Joaquin Valley have been limited. The conversion of land and intensive farming practices over the last century may have destroyed many Native American cultural sites.

The CVP is being evaluated for the National Register. Facilities include the Friant Dam and the FKC. Friant Dam is located on the San Joaquin River, northeast of Fresno, California. Completed in 1942, the dam is a concrete gravity structure, 319 feet high, with a crest length of 3,488 feet. The FKC carries water over 151.8 miles in a southerly direction from Millerton Lake to the Kern River, four miles west of Bakersfield. The water is used for supplemental and new irrigation supplies in Fresno, Tulare, and Kern Counties. Construction of the FKC began in 1945 and was complete in 1951.

### **3.4.2 Environmental Consequences**

#### **3.4.2.1 No Action**

Under the No Action Alternative, there would be no impacts to cultural resources since there would be no modifications to existing conveyance systems and no new construction that would result in any ground disturbance. Conditions related to cultural resources would remain the same as existing conditions.

#### **3.4.2.2 Proposed Action**

The Proposed Action would allow for the delivery of water through existing conveyance to CV contractors who have previously received water. There would be no modifications to existing facilities and construction of new facilities. As a result, there would be no potential to affect historic properties pursuant to 36 CFR Part 800.3(a)(1). Since no historic properties would be affected, the Proposed Action would not impact cultural resources (Appendix G).

**Cumulative Impacts** The Proposed Action is not ground disturbing, would not involve land use changes, and would not require new facilities or infrastructure to be built; therefore, it would not contribute to cumulative impacts to archaeological or historical resources.

## 3.5 Indian Trust Assets

### 3.5.1 Affected Environment

ITA are legal interests in assets that are held in trust by the U.S. Government for federally recognized Indian tribes or individuals. The trust relationship usually stems from a treaty, executive order, or act of Congress. The Secretary of the Interior is the trustee for the United States on behalf of federally recognized Indian tribes. “Assets” are anything owned that holds monetary value. “Legal interests” means there is a property interest for which there is a legal remedy, such a compensation or injunction, if there is improper interference. ITA cannot be sold, leased or otherwise alienated without the United States’ approval. Assets can be real property, physical assets, or intangible property rights, such as a lease, or right to use something; which may include lands, minerals and natural resources in addition to hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, ITA may be located off trust land. Reclamation shares the Indian trust responsibility with all other agencies of the Executive Branch to protect and maintain ITA reserved by or granted to Indian tribes, or Indian individuals by treaty, statute, or Executive Order.

### 3.5.2 Environmental Consequences

#### 3.5.2.1 No Action

The No Action Alternative is similar to the Proposed Action. Historical diversions and water deliveries would continue as in the past. Therefore no impacts to ITA would occur.

#### 3.5.2.2 Proposed Action

The Proposed Action involves water that is already allocated and would not include modifications or new construction of facilities. Therefore, the Proposed Action would have no impacts to ITA (Appendix G).

**Cumulative Impacts** The Proposed Action would have no impacts to ITA; therefore, there would subsequently be no cumulative impacts to ITA.

## 3.6 Socioeconomic Resources

### 3.6.1 Affected Environment

The human population in the southern SJV increased substantially in the 1980’s, led by 50 to 60 percent growth in the Fresno, Bakersfield and Visalia-Tulare urban areas (DWR 1998). This trend is expected to continue and the region’s population is projected to more than double over the next 30 years. Most of the future growth within the southern SJV is expected in Fresno, the Visalia-Tulare area and Bakersfield (DWR 1998). Between 1996 and 1998, the counties of Fresno, Kern, Tulare and Kings were in the top seven urbanizing counties within California and the top eight with the most irrigated farmland converted to urban land during the same period (CDC 2000).

The socioeconomical conditions in the SJV are described in more detail in the incorporated by reference documents. In summary, the agricultural industry contributes to the economic vitality of the SJV. One in three jobs is related to the agricultural industry. Agriculture is the leading industry within the Tulare Lake Basin, as reflected by the majority of the private land being used

for irrigated agriculture. Three million acres of irrigated agriculture occurs between the southern limit of the San Joaquin River watershed and the crest of the Tehachapi Mountains, versus 176,300 acres of urban areas (DWR 1998).

## **3.6.2 Environmental Consequences**

### **3.6.2.1 No Action**

Under the No Action Alternative, Reclamation may not have a streamlined environmental review process resulting in redundancy and inefficiency and increased administrative costs. Exchange requests may not be approved in a timely manner and implemented when water is available. Water prices may increase slightly for the local area.

### **3.6.2.2 Proposed Action**

The Proposed Action involves similar amounts of water delivered and applied to lands in the SJV as in the past. The Proposed Action would allow for improved water deliveries to the CV contractors when it is needed during the growing season and maintain the stability of the agricultural market and economical vitality for the SJV. The Proposed Action would result in improved water management and could reduce purchases of water supplies by the CV contractors. The Proposed Action could maintain costs for water through the imbalanced exchange scenario. The amount of water is small and would not contribute to changes in water prices.

**Cumulative Impacts** The Proposed Action when added to other actions does not contribute to significant increases or decreases in socio-economical conditions. The multiple water service actions have occurred historically and are not precedent setting. The Proposed Action would not increase or decrease long-term water supplies that would result in decisions by landowners to permanently change existing land uses.

Water districts strive to provide affordable surface water to the farmers to curtail groundwater overdraft and to maintain the economic stability and agricultural related jobs and economic base within their communities and service areas. In addition, water service actions are sought to convey water over shortest distances to lower pumping costs and energy usage. The saved money is used to hire staff, pay overhead costs, maintain and improve facilities. These water districts are non-profit and maintain financial records that are accessible to the public.

## **3.7 Environmental Justice**

### **3.7.1 Affected Environment**

Executive Order 12898, dated February 11, 1994, requires Federal agencies to ensure that their actions do not disproportionately impact minority and disadvantaged populations. Many agricultural jobs require unskilled labor and the pay tends to be low. The employment opportunities for agricultural jobs draw low income and minority populations. The farm workers reside in surrounding communities.

## 3.7.2 Environmental Consequences

### 3.7.2.1 No Action

The No Action Alternative may result in less water delivered for irrigated agriculture within the CV contractor's service areas. Less water could translate into less acres planted and less jobs for farm workers who are typically from minority and disadvantaged populations. The No Action Alternative would have a small negative impact on minority and disadvantaged populations.

### 3.7.2.2 Proposed Action

The Proposed Action would result in the preservation of jobs for minority or disadvantaged populations within the CV contractors' service areas. The same amount of water would be made available for croplands within the SJV as has historically occurred. Managing existing water supplies would continue as in the past including decisions to purchase other supplies, pumping groundwater, planting or growing less water intensive types of crops or fallowing lands. No lands would be permanently taken out of agricultural production. Any actions that maintain seasonal jobs within the CV contractors' service areas should be considered beneficial; therefore, a small positive impact to environmental justice would benefit minority and disadvantaged populations.

**Cumulative Impacts** The Proposed Action does not contribute to adverse cumulative effects to low or disadvantaged populations. The Proposed Action, when added to other water service actions improve water management to grow crops that sustain job agricultural job opportunities providing a benefit for minority or disadvantaged populations. No lands would be taken out of long-term agricultural production. No increase of cultivated lands would occur as a result of conveying and deliveries of this water.

## 3.8 Air Quality

Section 176 (c) of the Clean Air Act (CAA) (42 U.S.C. 7506 (c)) requires that any entity of the Federal government that engages in, supports, or in any way provided financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) required under Section 110 (a) of the CAA (42 U.S.C. 7401 (a)) before the action is otherwise approved. In this context, conformity means that such federal actions must be consistent with a SIP's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditious attainment of those standards. Each federal agency must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements will, in fact conform to the applicable SIP before the action is taken.

On November 30, 1993, the Environmental Protection Agency (EPA) promulgated final general conformity regulations at 40 CFR 93 Subpart B for all Federal activities except those covered under transportation conformity. The general conformity regulations apply to a proposed Federal action in a non-attainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutant caused by the Proposed Action equal or exceed certain threshold amounts, thus requiring the Federal agency to make a determination of general conformity.

### **3.8.1 Affected Environment**

The project area is mostly located within the San Joaquin Valley Air Basin (SJVAB) which is the second largest air basin in California. Despite years of improvements, the SJVAB does not meet State and Federal health-based air quality standards. The governing body over the SJVAB, the San Joaquin Valley Air Pollution Control District (SJVAPCD), has adopted stringent control measures to reduce emissions and improve overall air quality within the SJVAB.

### **3.8.2 Environmental Consequences**

#### **3.8.2.1 No Action**

Under the No Action Alternative, there would be no impacts to air quality since conditions would remain the same as the existing conditions.

#### **3.8.2.2 Proposed Action**

Under the Proposed Action, movement of water between CV contractors and potential exchange partners would be done via gravity flow and/or pumped using electric motors which have no emissions. The air quality emissions from electrical power have been considered in environmental documentation for the generating power plant. There are no emissions from electrical motors and therefore a conformity analysis is not required under the CAA and there would be no impact on air quality.

**Cumulative Impacts** The Proposed Action would utilize gravity and/or pumped using electric motors which have no emissions. Therefore, when taking into consideration other similar actions, no adverse cumulative impacts to air quality are expected.

## **3.9 Global Climate**

### **3.9.1 Affected Environment**

Climate change refers to significant change in measures of climate that last for decades or longer. Burning of fossil fuels is considered a major contributor to perceived global climate change. Carbon dioxide, which is produced when fossil fuels are burned, is a greenhouse gas (GHG) that effectively traps heat in the lower atmosphere. Some carbon dioxide is liberated naturally, but this may be augmented greatly through human activities. Human activity has substantially added to the amount of carbon dioxide in the atmosphere, primarily through burning of fossil fuels. This action enhances the natural greenhouse effect, and is likely contributing to an increase in global average temperature and related climate changes. The magnitude and significance of anthropogenic effects is being examined and debated and there is uncertainty associated with the science of climate change (EPA 2009).

Increases in air temperature may lead to changes in precipitation patterns, runoff timing and volume, sea level rise, and changes in the amount of irrigation water needed due to modified evapotranspiration rates. These changes may lead to impacts to California's water resources and project operations. While there is general consensus in their trend, the magnitudes and onset-timing of impacts are uncertain and are scenario-dependent (Anderson et al. 2008).

In lieu of a specific threshold of significance, it is noteworthy that the EPA has issued the Final Mandatory Reporting of Greenhouse Gases Rule which requires that sources of GHG emissions greater than 25,000 metric tons per year are required to submit annual reports to EPA.

### **3.9.2 Environmental Consequences**

#### **3.9.2.1 No Action Alternative**

Implementation of the No Action Alternative would involve no change on the composition of GHG in the atmosphere and therefore would not contribute to global climate change.

#### **3.9.2.2 Proposed Action**

It is likely the CV contractors would seek the least costly exchanges by conveying water shorter distances resulting in less power usage. The amount of power needed to convey 128,300 AF/y of water is small when compared to the overall water supplies and power used each year to move water where it is needed. CVP power is currently not used for exchanges occurring under Article 55 of the SWP.

GHG generated by a project is expected to be extremely small compared to other sources contributing to potential climate change since the exchanges of water would be conveyed mostly via gravity and little, if any, additional pumping from electric motors would be required. While any increase in GHG emissions would add to the global inventory of gases that would contribute to global climate change, the Proposed Action would result in potentially minimal increases in GHG emissions and a net increase in GHG emissions among the pool of GHG would not be detectable.

**Cumulative Impacts** GHG impacts are considered to be cumulative impacts. The Proposed Action, when added to other existing and proposed actions, would not contribute to cumulative impacts to global climate change owing to the EPA threshold (25,000 tons/year) magnitude of GHG emissions requirement for reporting.

## **Section 4 Consultation and Coordination**

### **4.1 Fish and Wildlife Coordination Act (16 USC § 661 et seq.)**

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources. The Proposed Action does not involve federal water development projects. Therefore, the FWCA does not apply.

### **4.2 Endangered Species Act (16 USC § 1531 et seq.)**

Section 7 of the Endangered Species Act requires Federal agencies, in consultation with the Secretary of the Interior and/or Commerce, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species.

Reclamation has determined that the Proposed Action would not affect any Federally proposed or listed species or any proposed or designated critical habitat. Therefore, no consultation is required with either the USFWS or the National Marine Fisheries Service.

### **4.3 National Historic Preservation Act (16 USC § 470 et seq.)**

The NHPA of 1966, as amended (16 USC 470 *et seq*), requires that federal agencies give the Advisory Council on Historic Preservation an opportunity to comment on the effects of an undertaking on historic properties, properties that are eligible for inclusion in the NRHP. The 36 CFR Part 800 regulations implement Section 106 of the NHPA.

Section 106 of the NHPA requires federal agencies to consider the effects of federal undertakings on historic properties, properties determined eligible for inclusion in the NRHP. Compliance with Section 106 follows a series of steps that are designed to identify interested parties, determine the APE, conduct cultural resource inventories, determine if historic properties are present within the APE, and assess effects on any identified historic properties. The activities associated with the Proposed Action would include no new ground disturbance, no change in land use, and the use of existing conveyance features to move and store water. Reclamation has determined that there would be no potential to affect historic properties by the Proposed Action pursuant to 36 CFR 800.3(a)(1). Since the Proposed Action would have no potential to affect historic properties, consultation with SHPO was not required (Appendix G).

### **4.4 Migratory Bird Treaty Act (16 USC § 703 et seq.)**

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Unless permitted by regulations, the Act provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Subject to limitations in the Act, the Secretary of the Interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of any migratory bird, part, nest or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns.

The Proposed Action would be in compliance with the MBTA.

## **Section 5 List of Preparers and Reviewers**

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# Appendix A – Article 5(a) Language

## ARTICLE 5(A)

### POINT OF DIVERSION AND RESPONSIBILITY FOR DISTRIBUTION OF WATER

5. (a) Project Water scheduled pursuant to subdivision (b) of Article 4 of this Contract shall be delivered to the Contractor at a point or points of delivery either on Project and/or State facilities or another location or locations mutually agreed to in writing by the Contracting Officer, DWR, and the Contractor. The parties acknowledge that Project Water to be furnished to the Contractor pursuant to this Contract shall be conveyed by DWR and delivered to the Contractor by direct delivery via the Cross Valley Canal and/or by exchange arrangements involving Arvin-Edison Water Storage District or others. The parties further acknowledge that such exchange arrangements are not transfers subject to Section 3405(a) of CVPIA. Notwithstanding Article 9 of this Contract, such exchange arrangements, other than the previously approved exchange arrangements with Arvin-Edison Water Storage District, shall be submitted to the Contracting Officer for approval in accordance with principles historically applied by the Contracting Officer in approving Cross Valley exchange arrangements. DWR shall have no obligation to make such exchange arrangements or be responsible for water transported in facilities that are not a part of the SWP.

(b) Omitted

(b2) When Project Water is made available by the Contracting Officer at Clifton Court Forebay, DWR shall provide to the Contractor, subject to the availability of capacity as determined by DWR, conveyance from the Delta and storage in DWR's share of storage at San Luis Reservoir, if necessary, of such Project Water consistent with subdivision (k) of Article 3, the following provisions, and the Operations Manual; (1) The Contracting Officer shall deliver or cause to be delivered into the DWR's Clifton Court Forebay, or at other points mutually agreed to by the parties in accordance with Article 5, Project Water in such quantities and of such quality as shall be sufficient to perform the Contracting Officer's and DWR's obligation to furnish water to the Contractor as set forth in this contract. Such deliveries into Clifton Court Forebay shall be made at such times and rates of flow as the Contracting Officer and DWR shall agree. (2) DWR, in accordance with an approved Project Water delivery schedule, shall convey the amount of water delivered into DWR's Clifton Court Forebay by the Contracting Officer directly: (i) to turnouts from the California Aqueduct from Reaches 3 through 16A or to other points of diversion mutually agreed to in writing by DWR and the Contractor, or (ii) to DWR or Federal share of storage in San Luis Reservoir for later release and delivery to the Contractor or (iii) to replace water delivered to the Contractor from DWR's share of San Luis Reservoir prior to DWR receiving Project Water from the Contracting Officer, to the extent DWR determines under subdivision (k) of Article 3 that capacity (and water in the event of an exchange) is available for such conveyance, storage, or exchange (if any). Such deliveries of Project Water shall be required to be made pursuant to subdivision (k) of Article 3 and in a manner which will not increase the cost of or adversely affect SWP operations and

the quantity or quality of water deliveries to SWP Contractors. (3) If DWR delivers water to the Contractor from DWR's share of storage in San Luis Reservoir prior to the Contracting Officer providing Project Water at DWR's Clifton Court Forebay, the United States shall return a like amount of water to DWR pursuant to the procedures set forth in the Operations Manual. (4) The total amount of Project Water delivered at Clifton Court Forebay to DWR by the Contracting Officer shall include water to compensate DWR for water conveyance and storage losses incurred in the delivery of Project Water to the Contractor. The amount of such conveyance and storage losses will be determined pursuant to procedures set forth in the Operations Manual. (5) Project Water received by DWR at Clifton Court Forebay for conveyance and/or storage for delivery to the Contractor will be commingled with waters of DWR which are pumped through facilities of the California Aqueduct and with other waters of both the United States and DWR in the joint use facilities of the San Luis Unit. (6) Priorities for use of DWR's share of storage at San Luis Reservoir for storage of Project Water shall be subject to subdivision (k) of Article 3 and all DWR obligations to the SWP operations and SWP Contractors and to the criteria specified in the Operations Manual. (7) Subject to the necessary arrangements, the Contracting Officer shall 477 transmit or cause to be transmitted, by exchange or otherwise, such quantities of power as shall be required by DWR to pump through its Delta Pumping Plant and its share of Dos Amigos Pumping Plant, the quantities of Project Water transported into Clifton Court Forebay pursuant to (1) of this subdivision. (8) DWR shall furnish the Contracting Officer with such information as the Contracting Officer and DWR agree is needed regarding the timing and quantities of power required by DWR to pump Project Water. Such information shall be exchanged between the Contracting Officer and DWR in accordance with provisions set forth in the Operations Manual. (9) The Contracting Officer and DWR may, under terms and conditions satisfactory to both, and in accordance with applicable law, exchange water and/or power necessary for delivery of Project Water to the Contractor under terms of this Contract. Such exchange shall be in accordance with the provisions set forth in the Operations Manual.

- (b3) To the extent that Friant Division Project Water exceeds Friant Division Contract demand and other Project purposes, as determined by the Contracting Officer, and if the Contractor so requests, the Contracting Officer, subject to subdivision (d) of Article 3 of this Contract, shall make Project Water provided for in subdivision (a) of Article 3 of this Contract available from such Friant Division supplies.
- (b4) Project Water may be provided by the Contracting Officer to the Contractor, at the Contractor's request and subject to the terms and conditions of this Contract, through Federal Delta diversion and conveyance facilities and/or stored in the Federal share of storage at San Luis Reservoir for reregulation for later delivery to the Contractor to the extent such diversion, conveyance and/or storage does not diminish the ability of the Project to deliver Project Water to users in the Delta Division, San Luis Unit and San Felipe Division service areas pursuant to existing contracts and assignments or any renewals thereof, to meet current Reclamation commitments to Pajaro Valley Water Management Agency, or to meet other legal obligations of the Project including, but not limited to agreements related to the joint operation of the state and Federal projects. (c)

The Contractor shall deliver Irrigation Water in accordance with any applicable land classification provisions of Federal Reclamation law and the associated regulations. The Contractor shall not deliver Project Water to land outside the Contractor's Service Area unless approved in advance by the Contracting Officer. (d) All Water Delivered to the Contractor pursuant to this Contract shall be measured and recorded with equipment furnished, installed, operated, and maintained by the United States, DWR or the Operating Non-Federal Entity/Entities at the point or points of delivery established pursuant to subdivision (a) of this Article. Upon the request of either party to this Contract, the Contracting Officer or DWR shall investigate, or cause to be investigated by the appropriate Operating Non-Federal Entity, the accuracy of such measurements and shall take any necessary steps to adjust any errors appearing therein. For any period of time when accurate measurements have not been made, the Contracting Officer shall consult with the Contractor and the appropriate Operating Non-Federal Entity prior to making a final determination of the quantity delivered for that period of time. (e) Neither the Contracting Officer, nor DWR, nor any Operating Non-Federal Entity/Entities shall be responsible for the control, carriage, handling, use, disposal, or distribution of Water Delivered to the Contractor pursuant to this Contract beyond the delivery points specified in subdivision (a) of this Article. The Contractor shall indemnify the United States, DWR, and their officers, employees, agents, and assigns on account of damage or claim of damage of any nature whatsoever for which there is legal responsibility, including property damage, personal injury, or death arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such Water Delivered beyond such delivery points, except for any damage or claim arising out of: (i) acts or omissions of the Contracting Officer, DWR, or any of their officers, employees, agents, or assigns, including the Operating Non-Federal Entity/Entities, with the intent of creating the situation resulting in any damage or claim; (ii) willful misconduct of the Contracting Officer, DWR, or any of their officers, employees, agents, or assigns, including the Operating Non-Federal Entity/Entities; (iii) negligence of the Contracting Officer or any of his officers, employees, agents, or assigns including the Operating Non-Federal Entity/Entities; or (iv) damage or claims resulting from a malfunction of facilities owned and/or operated by the United States, DWR, or the Operating Non-Federal Entity/Entities; Provided, That the Contractor is not the Operating Non-Federal Entity that owned or operated the malfunctioning facility(ies) from which the damage claim arose. In the event any such claim or liability, referenced in this Article or otherwise arising from this Contract, is made against DWR, its officers or its employees, the Contractor agrees to defend, indemnify and hold each of them harmless from such claim to the extent such claim does not arise from an error or omission of DWR related to the carriage and control of Project Water made available to the Contractor by the Contracting Officer.

# Appendix B – Potential Imbalanced Exchange Scenarios and Exchange Mechanisms

## SCENARIOS WHEREBY IMBALANCES COULD OCCUR

### Scenario 1 – Evaporation and Conveyance Losses

In some cases the exchange parties are miles apart or the exchange water is temporarily stored resulting in losses of water due to evaporation and/or seepage. Consequently, one (or more) recipient does not receive the entire amount of water. The parties would enter into mutually agreeable terms to compensate for such losses.

### Scenario 2 – Differing Hydrological Conditions

The hydrological conditions in the State of California are sporadic. Northern California could receive higher precipitation and snow-pack to fill reservoirs compared to Southern California. Annual allocations are based on snowmelt and runoff for the Friant and Delta CVP contractors. These varying conditions could result in less water available to complete the exchanges. The exchange arrangements between the parties typically include mutually agreeable terms for compensation if such conditions occur.

### Scenario 3 – Timing of Water Deliveries

As stated in the Background Section above, the CV's CVP water is delivered to SWP facilities when an opportunity exists for DWR to convey this water. This opportunity is often outside of the growing season when the water is not needed for crops in the CV's districts. In these cases, the CVs could enter into agreements with an exchangee that is able to take this water at the time it is available. Later during the growing season, an amount of water would be returned to the CV. The amount returned to the CV would be less than the amount delivered to the exchangee to compensate the exchangee for the service of providing this water to the CVC at a time it is needed.

### Scenario 4 – Differing Values of Water During the Year

Scenario 4 is similar to Scenario 3. However the imbalanced exchange is due to other timing issues other than restrictions by DWR to convey the CV Contractor's water. The value of water is typically much higher between June and September. Exchange agreements could include an imbalanced exchange of water based on unpredictable timing constraints to offset the difference in the value of the water when it is delivered.

## Potential Cross Valley Contractors Exchange Mechanisms

### 1. Historical exchanges with AEWS

- Reclamation provides CVP water to CV contractor from the Delta
- Delivery from CV contractor to AEWS
  - i. If capacity is available at Jones Pumping Plant

- The San Luis and Delta-Mendota Water Authority (SLDMWA) conveys CV contractor water in CVP facilities
    - a. Point-of-delivery from SLDMWA to CV contractor is O’Neill Forebay
    - b. Reclamation provides Federal power at Jones Pumping Plant
  - DWR wheels CV contractor water in SWP facilities from O’Neill Forebay
    - a. Point-of-delivery is AEWS D turnouts off of the Aqueduct or the CVC turnout off of the Aqueduct
    - b. If CVC is used, then the Kern County Water Agency (KCWA) conveys CV contractor water in the CVC to AEWS D’s turnout off of the CVC
    - c. Reclamation provides Federal power at Dos Amigo Pumping Plant
  - ii. If capacity is available at Banks Pumping Plant
    - DWR conveys CV contractor water in SWP facilities
      - a. Point-of-delivery is AEWS D’s turnouts off of the Aqueduct or the CVC turnout off of the Aqueduct
      - b. If the CVC is used, then KCWA conveys CV contractor water in the CVC to AEWS D’s turnout off of the CVC
      - c. Reclamation provides Federal power at Banks and Dos Amigo Pumping Plants
  - Return from AEWS D to CV contractor
    - i. Point-of-delivery to CV contractor is CV contractor turnouts off of the FKC
    - ii. Source of water is Friant Division CVP water
  - Exchange may be unbalanced (up to 2:1 average exchange ratio over a 10-year period)
2. Exchange with Friant Division CVP contractor
- Reclamation provides CVP water to CV contractor from the Delta
  - Delivery from CV contractor to Friant Division CVP contractor
    - i. If capacity is available at Jones Pumping Plant
      - SLDMWA conveys CV contractor water in CVP facilities
        - a. Point-of-delivery from SLDMWA to CV contractor is O’Neill Forebay
        - b. Reclamation provides Federal power at Jones Pumping Plant
      - DWR conveys CV contractor CVP water in SWP facilities from O’Neill Forebay
        - a. Point-of-delivery is the CVC turnout off of the Aqueduct
        - b. Reclamation provides Federal power at Dos Amigo Pumping Plant
      - KCWA conveys CV contractor water in CVC through the CVC/FKC Intertie into FKC
      - CV contractor water enters FKC as “Project Water” subject to Reclamation Law with no requirement for a Warren Act contract
      - FWA delivers water to Friant Division contractor
    - ii. If capacity is available at Banks Pumping Plant

- DWR wheels CV contractor CVP water in SWP facilities
    - a. Point-of-delivery is the CVC turnout off of the Aqueduct
    - b. Reclamation provides Federal power at Banks and Dos Amigo Pumping Plants
  - KCWA conveys CV contractor CVP water in CVC through the CVC/FKC Intertie into FKC
  - Water enters FKC as “Project Water” subject to Reclamation Law with no requirement for a Warren Act contract
  - The Friant Water Authority (FWA) delivers water to Friant Division CVP contractor
  - Return from Friant Division CVP contractor to CV contractor
    - i. Point-of-delivery to CV contractor is CV contractor turnouts off of the FKC
    - ii. Source of water is Friant Division CVP water
  - Exchange may be unbalanced (up to 2:1 average exchange ratio over a 10-year period)
3. Exchange with SWP contractor
- Reclamation provides CVP water to CV contractor from the Delta
  - Delivery from CV contractor to SWP contractor
    - i. Point-of-delivery of CV contractor water to SWP contractor is in the Delta
    - ii. SWP contractor conveys CV contractor water under Article 55 of its SWP contract for delivery to SWP contractor
    - iii. Reclamation provides Federal power at Banks and Dos Amigo Pumping Plants
  - SWP contractor returns water to CV contractor
    - i. If source of delivery to CV contractor is SWP contract supplies
      - SWP contractor wheels CV contractor water in SWP facilities to the CVC turnout off of the Aqueduct
      - KCWA wheels water in CVC through the CVC/FKC Intertie into FKC
      - Water enters FKC as “Project Water” subject to Reclamation Law with no requirement for a Warren Act contract
      - FWA delivers water to CV contractor
    - ii. If source of delivery to CV contractor is from previously banked CVP, SWP, Kern River, 215, or abandoned water
      - SWP contractor delivers recovered groundwater to CVC
      - KCWA wheels water in CVC through the CVC/FKC Intertie into FKC
      - Water enters FKC as “Project Water” subject to Reclamation Law with no requirement for a Warren Act contract
      - FWA delivers water to CV contractor
  - Exchange may be unbalanced (up to 2:1 average exchange ratio over a 10-year period)
4. Exchange with Tulare Lake Basin Water Storage District (TLBWSD)
- Reclamation provides CVP water to CV contractor from the Delta
  - Delivery from CV contractor to TLBWSD
    - i. Point-of-delivery to SWP contractor is in the Delta

- ii. SWP contractor conveys CV contractor CVP water supplies under Article 55 of its SWP contract for delivery to SWP contractor
  - iii. Reclamation provides Federal power at Banks and Dos Amigo Pumping Plants
- Exchange for Friant Division CVP Water Supplies
  - i. TLBWSD delivers CV contractor water to TLBWSD points-of-diversion off the Aqueduct
  - ii. TLBWSD delivers non-project water from Pine Flat, Kaweah or Success Reservoirs to Friant Division CVP contractors on the same local system
  - iii. Friant Division CVP contractors deliver CVP water via the FKC to the CV contractors
  - iv. Water is delivered to the CV contractor as "Project Water" subject to Reclamation law with no requirement for a Warren Act contract
  - v. Water is delivered to the TLBWSD as non-project water not subject to Reclamation law with no requirement for a Warren Act contract
- Exchange may be unbalanced (up to 2:1 average exchange ratio over a 10-year period)

# Appendix C – Cross Valley CVP Contractors

## CV Contractors

There are seven (7) CV Contractors as previous stated (See Table 1). However, some CV Contractors are comprised of more than one district. Altogether, there are sixteen (15) water districts within the group known as the CV Contractors. The following description characterizes each water district.

### County of Fresno

Pursuant to the County of Fresno's water service contract CVP water is delivered to Fresno County Service Area #34 that receives approximately 500 af/y.

### County of Tulare

Tulare County is comprised of ten water districts. In certain years, only a portion or none of the CV water is pumped and conveyed, therefore, they purchase water on the open market to make up the deficits. The ten districts are described below:

#### Alpaugh Irrigation District

Alpaugh Irrigation District (AID) was formed in 1915 and is located in Tulare County approximately 15 miles south of Corcoran and 15 miles northwesterly of Delano, California. AID is comprised of approximately 10,500 acres, of which 5,400 are irrigated. Groundwater provides the primary water supply to AID. AID also operates 18 wells. Two of the deep wells, provide approximately 300 af/y of potable water supply to the Community of Alpaugh. The population in Alpaugh is approximately 1,150. AID maintains 60 miles of domestic water pipelines.

In 1975, AID entered into a contract with the County of Tulare as a subcontractor for CVP water. Historically, AID has entered into exchange arrangements with AEWS under Article 5 of the water service contract. AID receives 100 af/y of CVP water through its contract with County of Tulare. Through the exchange arrangements, AEWS takes delivery of this water and AID takes delivery of the CVP water that would have been delivered to AEWS from the Friant facilities. AID receives its CVP water supplies via Deer Creek. Water from the FKC is diverted into Deer Creek and flows approximately 12 miles to the Deer Creek check structure located on the westerly side of Highway 43 at the northeasterly corner. AID has approximately 45 miles of unlined canals and approximately 25 miles of pipeline. AID has three regulating reservoirs. Reservoir No.1 is the primary regulatory reservoir is used year round to provide timing and flexibility in water deliveries. Reservoirs 2 and 3 are used to provide additional storage to meet the peak demand flows during the summer months. Collectively, the reservoirs cover approximately 800 acres and have a maximum capacity of 4,000 af.

AID does not have any other contracts or water rights to surface water supplies. However, during wet years AID has been able to utilize excess waters available in the Homeland Canal located on the westerly side, which if not used, would flow into the historic Tulare Lake. The main crops grown in AID are cotton, alfalfa, barley, and wheat.

### **Atwell Island Water District**

Atwell Island Water District (AIWD) was established in 1977 and is located in Kings and Tulare Counties approximately 1 ½ miles south of the Community of Alpaugh. AIWD is comprised of 7,136 acres, of which, 4,645 are irrigated. In 1978, AIWD entered into a long-term contract with Reclamation for 1,055 af/y of CVP water to be transported by DWR through SWP facilities to the CV and delivered to AEWS. The CVP water from the Friant facilities that would have flowed to AEWS are diverted at MP 102.67R via Deer Creek through Alpaugh Irrigation District's facilities to Atwell Island Water District. The contract for 1,055 af/y was terminated. In 1993, AIWD and Hills Valley Irrigation District entered into a contract for CV Contractors CVP water with the County of Tulare. Both AIWD and Hills Valley Irrigation District receive 954 af/y of CVP water. In recent years, Hills Valley Irrigation District has obtained 904 af/y of AIWD's supply under this agreement resulting in a reduction to 50 af/y for AIWD. AIWD also is a participant in the Mid-Valley Water Authority. This Authority was organized to develop the Mid-Valley Canal.

The distribution of AIWD's water is performed by Alpaugh Irrigation District through a wheeling agreement. Alpaugh Irrigation District owns and operates the approximately 36 miles of unlined canals and laterals. AIWD does not operate or maintain groundwater recharge or extraction facilities. Landowners must provide privately owned wells to sustain irrigation during periods when the AIWD does not have surface water available. AIWD serves only agricultural users. The main crops are cotton, alfalfa, barley, and wheat.

AIWD provides an in lieu conjunctive use program. In wet years, AIWD purchases supplies for use in lieu of pumping groundwater. AIWD uses primarily surface water supplies when it is available and relies on groundwater only when surface water is unavailable.

### **Hills Valley Irrigation District**

Hills Valley Irrigation District (HVID) is located in Fresno County about 20 miles east of Fresno and 5 miles north of Orange Cove. A small portion of the HVID is located in Tulare County. HVID does not maintain a central office or full time staff. The operations and maintenance of the facilities are conducted through a contractual agreement with a private contractor.

as a separate subcontractor. In 1995, the contract amount was amended to 3,346 af/y. HVID entered into a contract for Cross Valley CVP water through County of Tulare for 954 af/y and an additional 1,100 af/y. Subsequently HVID acquired 904 af/y from AIWD's subcontract with County of Tulare. The total amount of CVP water is 6,304 af/y.

Four intermittent streams flow into HVID. Wahtoke and Wooten Creeks flow through HVID. Hills Valley and Navelencia Creeks are both natural channels which have been destroyed by land leveling operations. An artificial channel has been constructed through the area that is adequate to prevent flooding from Hills Valley Creek, while no channel appears to be necessary to control any flooding from Navelencia Creek waters.

HVID is comprised of approximately 4,319 acres, of which, 3,602 are irrigated acres. HVID is divided into three areas. Improvement Districts Nos. 1 and 2 and the non-improved district.

Improvement District No. 1 covers 1,276 acres, Improvement District No. 2 is 1,990 acres and the remaining 795 acres are outside any improvement district but are within HVID's boundaries. HVID's distribution system is comprised of approximately 11 miles of pipeline. HVID does not have any groundwater extraction facilities, therefore, landowners must provide their own wells to sustain irrigation during periods when surface water supplies are inadequate. HVID constructed a 15 af regulating reservoir within Improvement District No. 1 and two regulating reservoirs in Improvement District No. 2.

The low yielding wells within HVID are useful as a supplemental irrigation supply and in controlling the buildup of a perched water table in some areas. Therefore, HVID has limited conjunctive use capability. HVID is located near the foothills of the Sierra Nevada Mountains and has relatively low aquifer storage capacity, shallow depth of sediments prevail and in some locations restricted lateral drainage out of HVID occurs. Landowners located in isolated areas do not have wells. For those landowners who do have wells maintain a balance between recharge and withdrawal to prevent insufficient water supplies from occurring while avoiding waterlogging other areas. Typically, the landowners with wells extract groundwater in the spring when the groundwater levels are at their highest. The main crops are oranges, prunes/plums and grapes.

#### **Saucelito Irrigation District**

See description elsewhere in this document. SID receives up to 100 af/y of CVP water under its contract with County of Tulare.

#### **Fransinetto Farms**

Fransinetto Farms receives up to 255 af/y of CVP water under its contract with County of Tulare.

#### **Stone Corral Irrigation District**

See description earlier in this document. SCID receives up to 950 af/y of CVP water under its contract with County of Tulare.

#### **City of Lindsay**

Lindsay is located on the east side of the San Joaquin Valley in Tulare County near the base of the Sierra foothills and has falling grade from east to west. Lindsay is traversed by State Highway 65 running north and south along the west side of the City. Lindsay is located approximately 12 miles east of Tulare and State Highway 99, approximately 11 miles north of Porterville and 15 miles southeast of Visalia. The first census of Lindsay in 1910 indicated 1,814 residents. The latest population estimates in January 1999 showed 9,015 residents. During the 1990's, yearly population growth was at or less than 1% per year. This rate of growth is slower than the rate of Tulare County. The 2000 census indicates the population in Lindsay at 10,297. Lindsay is an agricultural service center. The agricultural industry is built around citrus (oranges), and twelve orange packing houses, providing the major component of the economic base.

The City of Lindsay entered into a long-term water service contract with Reclamation for 2,500 acre feet per year (af/y) of Class 1 Friant water under contract number 5-07-20-W0428. The City of Lindsay receives up to 50 af/y of CVP water under its contract with County of Tulare.

Lindsay obtains their CVP water from the Friant-Kern Canal at the Honolulu Street turnout. The water treatment plant is at the same location and provides filtration, chemical additions and chlorination.

### **Strathmore Public Utility District**

SPUD provides wastewater treatment for a population of approximately 1,900 in the city of Strathmore. SPUD receives up to 400 af/y of CVP water through its contract with the County of Tulare. The CVP water is diverted from SPUD's turnout on the FKC and injected into a well to be used for blending with the wastewater before it reaches the headworks of the wastewater treatment plant. SPUD coordinates its diversions in a manner to minimize impacts to agricultural users along the FKC. The CVP water is typically diverted by SPUD during times of wet seasons and high flows when water turbidity is increased allowing for less chemicals used to coagulate and treat the wastewater. The treated water is temporarily stored in an onsite storage facility and is distributed to M&I customers.

### **Styrotek, Inc.**

Styrotek, Inc. is located near the city of Delano and manufactures shipping containers. The company receives up to 45 af/y of CVP water under its contract with the County of Tulare. The CVP water is used in the cooling process after the container molds are heated and formed. A portion of the water evaporates or is reclaimed for use in boilers.

### **City of Visalia**

The city of Visalia is located in Tulare County and is approximately 28.58 square miles with a population of approximately 102,000. Visalia receives up to 400 af/y of CVP water under its contract with County of Tulare.

Visalia exchanges up to 400 af/y of CV Project water with HVID's Wutchumna Water rights from the Kaweah River. HVID takes physical possession of the CVP water. However, this water is considered non-Project water and is applied to *ineligible* lands. Visalia takes physical possession of the Kaweah (Wutchumna) River water which is characterized as Project water. This water is conveyed through the Persian Ditch Company facilities and is applied to golf courses.

### **Kern-Tulare and Rag Gulch Water Districts**

The Kern-Tulare Water District and Rag Gulch Water District (KTRG) provide irrigation water to over 19,000 acres of high-value permanent crops in Kern and Tulare counties. The annual irrigation demand is approximately 54,000 acre-feet, of which (KTRG) currently provide approximately 40,000 acre-feet of imported water. The remaining 14,000 acre-feet per year are from groundwater pumped by water users.

KTRG are located on the eastern side of the San Joaquin Valley in Kern and Tulare counties, approximately 8 miles east of Delano and 27 miles north of Bakersfield. KTRG are approximately 4 miles in width generally located west of State Highway 65, and extend approximately 14 miles in length from Sherwood Avenue to Avenue 48.

The summer climate is hot and dry while winters are cooler with somewhat more rainfall than adjacent valley areas. KTRG are located within a thermal zone with favorable air movement where citrus, deciduous trees, and other frost sensitive crops are successfully grown. The average

length of the growing season in the area is from 250 to 300 days per year. Soils in both water districts are of excellent quality for irrigation.

KTRG currently comprise a gross area of approximately 24,000 acres, of which almost 19,000 acres are developed in irrigated agriculture. There are very few residences located within KTRG. At the present time, 99 percent of irrigated lands are permanent plantings. A summary of land use in 2000 is presented in the matrix below.

	Kern-Tulare	Rag Gulch	Total
Alfalfa	0	276	276
Almonds	480	100	580
Pistachios	1,111	0	1,111
Other Deciduous	355	15	370
Citrus	6,945	1,097	8,042
Subtropical	201	0	201
Grapes	<u>4,301</u>	<u>3,815</u>	<u>8,116</u>
Total Irrigated	13,393	5,303	18,696
Non-irrigated	<u>4,792</u>	<u>650</u>	<u>5,442</u>
Total	18,185	5,953	24,138

It is estimated that 1 percent of the cropped land in the Kern-Tulare Water District is irrigated by the sprinkler method, 8 percent is irrigated by the furrow method, and 91 percent is irrigated using the drip or micro-sprinkler irrigation method. This high percentage of low volume irrigation practices results in a very high irrigation efficiency.

Kern-Tulare Water District has a contract with the Bureau of Reclamation for 40,000 acre-feet of entitlement from the Central Valley Project (CVP) and Rag Gulch Water District has a CVP contract for 13,300 acre-feet. The California Department of Water Resources conveys water under this contract through the California Aqueduct to Tupman. Water is then conveyed through the Cross Valley Canal from Tupman to the Friant-Kern Canal, where it is either delivered directly to the KTRG or exchanged with Arvin-Edison for water available in the Friant-Kern Canal.

Kern-Tulare Water District has a contract with the City of Bakersfield for an average of 20,000 acre-feet per year of Kern River water and Rag Gulch Water District has a similar contract for an average of 3,000 acre-feet per year. Water under these contracts is delivered to Kern County Water Agency Improvement District No. 4 in exchange for State Water Project Water. The State Water Project water is conveyed through the Cross Valley Canal to the Friant-Kern Canal, where it is either delivered directly to the KTRG or exchanged with Arvin-Edison for water available in the Friant-Kern Canal.

KTRG share common distribution systems and staff. The distribution system of KTRG delivers water from the Friant-Kern Canal to lands within KTRG. The distribution system consists of 4 pumping plants located along the Friant-Kern Canal, 4 regulating reservoirs, 7 re-lift pumping

plants, and approximately 70 miles of buried pipelines. In addition, KTRG operate 2 pumping plants located in Delano Earlimart Irrigation District (DEID) reservoirs and 1 pumping plant located in a Southern San Joaquin Municipal Water District (SSJMUD) reservoir.

The depth to groundwater varies from about 200 feet to over 600 feet throughout KTRG and averages approximately 450 feet. There are static groundwater levels taken in the spring and do not include the temporary drawdown of 50 to 100 feet caused by pumping. Wells drilled on the west side of KTRG tap into an unconfined aquifer that is classified as suitable for irrigation. Groundwater in this area contains between 250 and 400 parts per million (ppm) total dissolved solids and is of a calcium bicarbonate or sodium bicarbonate chemical type. Wells drilled on the east side of KTRG tap into confined aquifers that also contain useable groundwater. This groundwater is characterized as sodium chloride with total dissolved solids concentrations between 300 and 500 ppm and is classed as having medium to high salinity hazard and high to very high sodium hazard.

### **Lower Tule River Irrigation District**

LTRID was formed in 1950. LTRID is currently comprised of 93,502 of agricultural lands, 7,671 of native or natural lands and approximately 1,917 acres of urban land uses. LTRID is located in Tulare County on the east side of the San Joaquin Valley. State Highway 99 bisects LTRID in a north-south direction, and the Tule River flows westerly through the entire length of the LTRID. The FKC is located five miles to the east of LTRID's northeast boundary and adjoins the southeast portion of LTRID between Avenues 136 and 128. The towns of Woodville, Popular and Tipton lie within LTRID's boundaries but are not serviced by LTRID. LTRID's entire distribution system is unlined earth canals. Collectively, LTRID owns or controls approximately 163 miles of canals and approximately 47 miles of river channel. LTRID maintains and operates 12 recharge and regulating basins, covering approximately 3,000 acres. In wetter years, LTRID uses these facilities to recharge the groundwater reservoir. LTRID does not own or control groundwater extraction facilities. Therefore, each landowner must provide privately owned wells to sustain irrigation during periods when LTRID does not have surface water available. The main crops in LTRID are alfalfa, grain/hay and cotton.

Currently, the water supplies in LTRID are groundwater, water rights on the Tule River, and CVP water under two separate contracts. The Tule River water supply is approximately 70,000 af/y. Tule River flows approximately 22 miles through the central part of the LTRID. Porter Slough follows a parallel course north of the Tule River. In 1951, LTRID entered into a long-term contract with Reclamation for 61,200 af/y of Class 1 and 238,000 af/y of Class 2 Friant water. In 1975, LTRID entered into a three-way contract with Reclamation and the California Department of Water Resources (DWR) to provide an additional 31,102 af/y of CVP water supply. Under this three-way contract, the CVP water is diverted from the Delta, conveyed through State Water Project (SWP) facilities via the California Aqueduct to the Cross Valley Canal to AEWS. Through the Cross Valley Canal Exchange Program, AEWS and LTRID 'swap' CVP water supplies from the Delta and Friant facilities. Recently, the exchange agreement between AEWS and LTRID has been terminated. LTRID may enter into similar exchange arrangements with other water districts to obtain their CVP water supplies from the Delta. Currently, LTRID sells their CVP contract supplies from the Delta and uses the money to purchase other supplies.

### **Pixley Irrigation District**

PXID is located in Tulare County and bisected by State Highway 99. The City of Pixley is located within the PXID's boundaries. However, PXID does not serve the City of Pixley. PXID was formed in 1958 and currently comprises 69,550 acres, of which 48,302 are irrigated. Deer Creek flows westerly through the entire length of PXID. The FKC is located between one to five miles east of PXID's boundary.

PXID's water supply is derived from the use of groundwater, diversions from Deer Creek and CVP water. PXID entered into a long-term contract with Reclamation in 1975 for 31,102 af/y. PXID operates a conjunctive use program by supplying a portion of the irrigated lands and a portion for direct groundwater recharge through Deer Creek, the existing canal system and sinking basins owned or leased by PXID. PXID obtains their CVP supplies through four turnouts on the FKC into Deer Creek to PXID diversions or Deer Creek. PXID has 45 miles of unlined canals that convey water and provide groundwater recharge. An estimated 30% of the CVP supplies are "lost" through the unlined canals. However, the recharge to the groundwater is considered a beneficial use of this water. PXID maintains and operated nine recharge and regulating basins covering approximately 330 acres.

PXID owns or has access to approximately 330 acres of sinking/re-regulating basins. These basins, along with the Deer Creek channel and the PXID's canals, are used for direct groundwater recharge when surface water supplies are available. It is estimated that a third of the water imported by PXID has been directly recharged into the underground reservoir by PXID operations since PXID's inception.

PXID does not own or operate and groundwater extraction facilities. However, groundwater is the primary water supply available to lands within PXID. Privately owned wells currently provide water to all irrigated lands within the PXID. Approximately 31,957 acres of lands rely totally on groundwater pumping for irrigation. In addition, PXID may enter into an agreement with the Pixley Wildlife Refuge to recharge the groundwater. The refuge is approximately 960 acres.

### **Tri-Valley Water District**

TVWD is comprised of 4,481 acres, of which, 1,812 are irrigable acres. The nearest town is Orange Cove. TVWD only serves agricultural water to seven growers and approximately 880 acres. TVWD does not provide groundwater. However all landowners have wells. Due to the proximity of TVWD to the Sierra foothills, groundwater supplies are typically inadequate. Wells tend to produce groundwater early in the growing season but produce very little in mid and late summer. The water distribution system is comprised of approximately seven miles of pipeline which is shared with Orange Cove Irrigation District landowners and operated by Orange Cove Irrigation District personnel. TVWD does not own or operate any canals, recharge basins, or regulating reservoirs. The main crops are oranges, lemons and tangerines.

# Appendix D – Friant Division CVP Contractors

## **Arvin-Edison Water Storage District**

(AEWSD) is located in Kern County in the southeasterly portion of the San Joaquin Valley. AEWSD was formed in 1942 and its original size was 129,988 acres. Currently, AEWSD comprises 132,000 acres, of which, 109,230 acres are irrigated. Urbanization has changed approximately 2,500 acres of agricultural lands to M&I. AEWSD entered into its first long-term contract with Reclamation in 1986 for 40,000 af of Class 1 and 311,675 af of Class 2 water. The main crops in AEWSD are grapes, potatoes, oranges and cotton.

The CVP water supplies for AEWSD are variable and regulates this water by use of the groundwater reservoir underlying AEWSD. In addition, AEWSD engages in Article 5 exchanges of CVP water with the CV Contractors. Up to 128,300 af/y of CV Contractor's CVP water is delivered to AEWSD. This water is diverted from the Delta through the Aqueduct and to the CVC. In exchange, the Friant CVP water that would have flowed down the FKC to AEWSD is diverted by the CV Contractors in the FKC. Due to the variances in allocations of Friant CVP water, these exchanges may not even out each year. However, over the long-term the amounts of water would be equal. Two of the CV Contractors have terminated their exchange arrangements with AEWSD resulting in approximately 70,984 af/y maximum delivered to the remaining six CV Contractors and approximately 66,096 af/y of water returned to AEWSD.

AEWSD takes Friant CVP water from a turnout located at the terminus of the FKC. AEWSD has 45 miles of lined canals and 170 miles of pipeline. AEWSD maintains three spreading basins to percolate water into the aquifer for storage. Gravity and pressure fed ponds are filled from surface water supplies in "wet" years, while groundwater wells are used to extract stored water in "dry" years. The safe yield of the groundwater supply is 89,900 af.

In 1997, AEWSD entered into a 25-year agreement with the Metropolitan Water District of Southern California (MWD), in which AEWSD agreed to bank approximately 250,000 af/y of MWD State Water Project Supply for later extraction in drought years. AEWSD has completed construction of an Intertie pipeline connecting the terminus of its canal to the California Aqueduct to enhance the water banking and exchange program. The Intertie pipeline does not create new or additional contractual supplies.

AEWSD has historically delivered an average of less than 2,000 af/y of non-CVP to two urban customers, East Niles Community Service District and Sycamore Canyon Golf Course.

## **Delano-Earlimart Irrigation District**

(DEID) is located in Tulare and Kern Counties on the eastern side of the San Joaquin Valley, approximately 10 miles from the Sierra foothills. DEID is comprised of 56,474 acres, of which 46,581 are irrigated. DEID serves agricultural water supplies only. In DEID entered into a long-term contact with Reclamation for 108,800 af/y of Class 1 and 574,500 af/y of Class 2 water. The main crops in DEID are grapes, almonds, deciduous and subtropical orchards. DEID obtains its CVP water from its turnout on the FKC and delivers the water to its customers through 172 miles of pipeline.

DEID recharges the groundwater during surplus “wet” years through operations with the White River channel, as well as, a small 5 acre recharge basin. In 1993, the DEID purchased and developed an 80 acre parcel specifically for development into a groundwater recharge basin. This basin has five separate cells and dual methods for introducing water to each cell from either DEID’s distribution system or from direct diversions out of White River. The FKC flows north-south through DEID and Lake Woollomes is located adjacent to DEID. Lake Woollomes is a feature of the FKC and CVP facilities. DEID does not obtain supplies or recreational opportunities from Lake Woollomes.

### **Exeter Irrigation District**

(EID) is located in Tulare County on the east side of the San Joaquin Valley, nine miles east of the City of Visalia. EID was formed in 1937 and in 1950 entered into a long-term contract with Reclamation for 10,000 af/y of Class 1 and 19,000 af/y of Class 2 water. In 1953, the Class 1 water supply was increased to 11,500 by an amendment to the contract. EID is comprised of approximately 15,184 acres and 12,700 are irrigated. The City of Exeter is located within EID. However, EID serves only agricultural water. EID obtains its CVP water from seven turnouts on the FKC located between MP 74.6 and MP 81.4. EID’s distribution system is comprised of approximately 60 miles of pipeline. EID maintains two small balancing or regulating reservoirs with a capacity of less than one af each. Yokohl Creek is an intermittent stream which traverses through the northern portion of EID in a northwesterly direction for approximately 2 miles. The main crops grown in EID are citrus, grapes, plums and olives.

### **Fresno Irrigation District**

(FID) was formed in 1920 under the California Irrigation Districts Act, as the successor to the privately owned Fresno Canal and Land Company. FID purchased all of the rights and property of the company for the sum of \$1,750,000. The assets of the company consisted of over 600 miles of canals and distribution works which were constructed between the years 1850 and 1880, as well as the extensive water rights on Kings River.

FID, which now comprises some 245,000 acres, lies entirely within Fresno County and includes the rapidly growing Fresno-Clovis metropolitan area. FID now operates approximately 800 miles of canals and pipelines. Total irrigated area exceeds 150,000 acres, although this number has been decreasing in recent years as a result of urban expansion. The main crops in FID are grapes, citrus, and cotton.

A significant improvement in the control and management of the waters of Kings River occurred with the completion of the Pine Flat Dam project by the USACOE in 1954. Although built primarily as a flood control project, Pine Flat Dam provides significant water conservation stemming from the storage and regulation of irrigation water to the 28 water right entities on Kings River including FID. FID is contracted for 11.9% of the 1,000,000 af capacity of Pine Flat Reservoir. While FID is entitled to approximately 26% of the average runoff of Kings River, much of its entitlement occurs at times when it can be used directly for irrigation of crops without the need for regulation at Pine Flat.

In a normal year, FID diverts approximately 500,000 af of water and delivers most of that to agricultural users, although an increasing share of FID’s water supply is used for groundwater

recharge in the urban area. Depending upon hydrological conditions and Kings River flows, FID diverts water and allocates a proportional share of the water to its customers including the City of Fresno and Clovis. In addition to its entitlement from Kings River, FID and the City of Fresno have signed contracts to purchase up to 135,000 af annually from the Friant Division of the CVP. Historically, excess water applied by the farmers has percolated beyond the root zone and recharged the extensive aquifer underlying FID. Between 85% and 90% of the groundwater supply can be attributed to water imported and distributed by FID.

However, the conversion of agricultural lands to high-density urban uses in the expanding Fresno-Clovis metropolitan area has reduced the capacity to utilize surface water because all municipal and industrial water is obtained by pumping groundwater. A local overdraft has developed in and around the urban area, and this situation has been exacerbated by the drought of the late 1980s and early 1990s.

FID has combined forces with the City of Fresno, the City of Clovis, the County of Fresno, and the Fresno Metropolitan Flood Control District in a cooperative effort to develop and implement a comprehensive surface and groundwater management program. The main goal of the program involves using flood control basins for recharge during the summer when the basins are not needed to control urban storm runoff. This program also contains elements designed to protect the quality of groundwater in the area.

#### **Garfield Water District**

(GWD) is located in Fresno County on the east side of the San Joaquin Valley near the foothills of the Sierra Mountains. GWD is comprised of 1,750 acres, of which, 1,300 are irrigated acres. The main crops are grapes, almonds, olives, stone fruit, citrus and pasture. The distribution system is approximately 8 miles of pipeline. GWD is a CVP contractor with 3,500 af/y of Class 1 Friant water. GWD has no other sources of surface water. GWD is near the foothills and groundwater supply is limited.

#### **Ivanhoe Irrigation District**

(IID) is located in Tulare County on the east side of the San Joaquin Valley approximately 50 miles southeast of Fresno and 8 miles northeast of Visalia. IID is generally located between the St. Johns River on the south and Cottonwood Creek on the north. As early as 1915 the lands began to be developed for agricultural uses. Irrigation was from groundwater pumping, precipitation and surface diversions from runoff on the Kaweah River. IID was formed in 1948 and has acquired private surface water rights through the Wutchumna Water Company. IID's owns 7.9 shares of Wutchumna Water stock equaling approximately 3,950 af of water. In 1949, IID entered into a long-term contract with Reclamation for 7,700 af/y of Class 1 and 7,900 af/y of Class 2 water. The non-CVP water supplies are diverted from the Kaweah River through the Wutchumna Ditch to IID's diversion facility and is co-mingled with the CVP supply. IID obtains its CVP water supplies through two turnouts on the FKC. IID's distribution system comprises approximately 48 miles of pipeline and three groundwater recharge areas. The three groundwater recharge areas cover approximately 15 acres and are used when surplus water is available. Approximately three miles of a portion of Cottonwood Creek is also used for recharge purposes. IID does not own or operate groundwater extraction facilities. Therefore, landowners must provide their own wells to sustain irrigation during periods when IID does not have surface water

supplies available. IID comprises of 11,202 acres, of which 10,648 are irrigated. The main crops in IID are grapes, citrus, deciduous fruits, and olives.

### **Kaweah Delta Water Conservation District**

Discussed in Appendix E.

### **Lewis Creek Water District**

(LCWD) is located on the east side of the San Joaquin Valley in Tulare County near the base of the Sierra foothills and has falling grade from east to west. LCWD is traversed by State Highway 65 running north and south along the west side of the City. LCWD is located approximately 12 miles east of Tulare and State Highway 99, approximately 11 miles north of Porterville and 15 miles southeast of Visalia. The first census of LCWD in 1910 indicated 1,814 residents. The latest population estimates in January 1999 showed 9,015 residents. During the 1990's, yearly population growth was at or less than 1% per year. This rate of growth is slower than the rate of Tulare County. The 2000 census indicates the population in LCWD at 10,297. LCWD is an agricultural service center. The agricultural industry is built around citrus (oranges), and twelve orange packing houses, providing the major component of the economic base. LCWD has a water service contract with Reclamation for 1,450 acre feet per year (af/y) of Class 1 Friant water.

LCWD obtains their CVP water from the Friant-Kern Canal at the Honolulu Street turnout. The water treatment plant is at the same location and provides filtration, chemical additions and chlorination.

### **Lindmore Irrigation District**

(LID) is located in Tulare County at the base of the Sierra foothills. LID's northern boundary extends approximately 2 miles from Lindsay and extends approximately 1 ½ miles south of Strathmore. LID is approximately 9 miles long and 10 miles wide and comprises 27,255 acres, of which 25,700 are irrigated. LID was formed in 1937 and in 1948 entered into a long-term contract with Reclamation for 33,000 af/y of Class 1 and 22,000 af/y of Class 2 water. LID lies over the Kaweah Basin. The safe groundwater yield for LID was calculated in 1987 to be 21,000 af/y. LID operates a conjunctive use program to manage surface and groundwater supplies. LID uses groundwater at the beginning of the growing season to warm the CVP water while filling LID's pipeline system. This reduces maintenance costs and leaks in the concrete irrigation pipes due to contraction of cold water. The main crops grown in LID are oranges, olives, cotton, and alfalfa. LID obtains their CVP supplies from four turnouts on the FKC between MP 88.4 and 93.2. LID's conveyance system comprises of 123 miles of pipeline and five reservoirs. The Noel reservoir is 3 af, earthen-clay lined reservoir used for balancing (overflow). The Montgomery reservoir is 4.5 af, earthen-clay lined and is used for balancing (overflow). The Brewer reservoir is 6.5 af, earthen-clay lined and is used for balancing (overflow). The 93.2E N. reservoir is 5.5 af, concrete lined and is used for balancing (equalizing). The 93.2-0.1S S. reservoir is 2.5 af, concrete lined and is used for balancing (equalizing).

### **Lindsay-Strathmore Irrigation District**

(LSID) was formed in 1915 and is located in Tulare County on the east side of the San Joaquin Valley. LSID comprises 15,700 acres, of which 12,700 acres are irrigated to permanent crops.

LSID's original imported water supply was from the Kaweah River through LSID's ownership of Wutchumna Water Company stock and 39 deep wells. The supplies from the Wutchumna Water Company range from 5,000 to 14,000 af/y. LSID enters into Warren Act Contracts with Reclamation to transport this water within LSID using CVP facilities. The groundwater supply is limited to 18,000 af/y. In 1948, LSID entered into a long-term contract with Reclamation for 3,900 af/y of Class 1 water. In 1985, the contract amount was amended to 27,500 af/y. The main crops in LSID are oranges and olives. LSID serves only agricultural water.

LSID obtains their CVP water supplies from its turnout at MP 85.56 of the FKC. LSID's distribution system is approximately 115 miles of pipeline and three balancing reservoirs. The Main reservoir is 80 af and concrete lined. The High-Level reservoir is 5 af and concrete lined and the El Mirado reservoir is a 200,000 gallon steel tank. LSID operates 5 groundwater wells with a normal production of 1,750 GPM. These wells are not utilized if surface water is available due to the high cost of pumping. No usable groundwater basin underlies LSID. LSID lies too far east against the foothills to be influenced by either the Kaweah or Tule Rivers. LSID does not operate recharge areas or a conjunctive use program. LSID contractually uses the conjunctive use capacity of the Tulare Irrigation District, a common stockholder in the Wutchumna Water Company, by delivering LSID's Kaweah River water through the Wutchumna Ditch to the Tulare Irrigation District turnout. Tulare Irrigation District either uses this water for irrigation (in lieu recharge) or direct sinking in their groundwater recharge basins. During "dry" years, Tulare Irrigation District's farmers utilize the groundwater delivered by LSID. Tulare Irrigation District returns surface water to LSID through either the FKC or through the Kaweah River system. LSID regularly transfers water to Lindmore Irrigation District, which borders LSID on the west. Approximately 2,500 af/y is transferred to Lindmore during normal water supply years.

### **Lower Tule River Irrigation District**

See description under Cross Valley Contractors.

### **Orange Cove Irrigation District**

(OCID) is located in Fresno and Tulare Counties and was formed in 1937. OCID is about 30 miles southeast of Fresno and 20 miles north of Visalia. OCID is 14 miles long and 3 miles wide and has 28,000 acres, of which approximately 26,788 are irrigated. In 1949, OCID entered into a long-term contract with Reclamation for 31,800 af and in 1989, the contract amount was amended to 39,200 af/y of Class 1 water. OCID obtains their CVP water supplies from fifteen diversion points on the FKC between MP 35.87 to 53.32. OCID's distribution system is 105 miles of pipeline and one regulating reservoir with a capacity of 8 af. OCID does not supply any M&I water. A groundwater basin is almost non-existing under OCID. The area immediately east of Smith Mountain and the area in the vicinity of Navelencia contain basin water. The majority of wells are located in this area. The safe yield does not exceed 28,000 af/y. OCID does not operate any groundwater wells or recharge facilities due to the existing groundwater conditions. OCID provides approximately 1.4 af per acre. Therefore, the balance of crop needs are made up from precipitation and groundwater pumping. The landowners in OCID manage the groundwater supplies through conjunctive use practices. OCID transfers unused water supplies out to other districts for storage and banking. OCID is pursuing partners for a long-term transfer program or groundwater banking program to balance water in wet and dry years. The main crops in OCID are citrus, grapes, deciduous and subtropical orchards, olives, and nuts.

### **Porterville Irrigation District**

(PID) is located in Tulare County and is comprised of 17,400 acres, of which 13,061 are irrigated. PID was formed in 1949. PID entered into a long-term contract with Reclamation for 16,000 af/y of Class 1 and 30,000 af/y of Class 2 water. PID has an average annual entitlement of 12,900 af/y of water supply from the Tule River.

The FKC enters PID at the northeast corner and exists in the south central portion. The Tule River passes through PID in a northwesterly direction. PID owns the facilities of two improvement districts. Improvement District No. 1 consists of approximately four miles of pipeline and serves 854 acres. Improvement District No. 2 consists of 3.3 miles of open ditch and serves 1,266 acres. PID obtains their CVP supplies from six diversion points on the FKC. In addition to its owned facilities, PID has entered into agreements with Lower Tule River Irrigation District and other entities to utilize non-District owned facilities to convey PID's Water. Through an agreement between PID and Lower Tule River Irrigation District, CVP water deliveries are conveyed through facilities owned or operated by Lower Tule River Irrigation District within PID. These facilities consist of 13 miles of unlined canals.

PID also conveys both CVP supplies and Tule River water through facilities owned by the Porter Slough Ditch Company, the Hubbs-Miner Ditch Company, the Rhodes-Fine Ditch Company and the Gilliam-McGee Ditch Company. These facilities consist of approximately 13 miles of unlined ditch within PID. The facilities belonging to these companies are operated by PID under long-term agreements with the entities. PID operates two percolation basins. PID owns no storage facilities. It does, however, own a portion of the water conservation storage space within Success Reservoir. This storage space is used to store water rights water owned by ditch companies with which PID has operating agreements. PID serves agricultural water only. The main crops in PID are walnuts, cotton, grapes, alfalfa, prunes, corn and citrus.

### **Saucelito Irrigation District**

SID was formed in 1941 and is located in Tulare County, approximately ten miles southwest of Porterville, two miles south of Poplar, eight miles east of Tipton and five miles west of Terra Bella. Deer Creek crosses SID, for about 5 miles, near its southerly boundary and runs during wet years. SID takes no diversions off Deer Creek. The FKC is located on the eastern boundary of SID.

SID entered into a long-term contract with Reclamation in 1959 for the construction of facilities. Water deliveries began in 1961 for 21,200 af/y Class 1 and 32,800 af/y of Class 2 water. Currently, SID comprises of 19,453 acres, of which 19,057 are irrigated. SID has five individual water users that are Riparian Water rights holders totaling 9.5 shares at 55 acre feet per share from Mole Ditch. SID engages in exchanges with the Cross Valley Contractors. SID obtains its CVP water supplies from 4 diversion points on the FKC between MP 11.64 and 107.35 and Deer Creek diversion at MP 102.69. SID's distribution system is 55 miles of pipeline with one recharge pond that covers approximately ½ acre. Deer Creek also provides groundwater recharge in wet years. The main crops in SID are milo, wheat, cotton, grapes and almonds.

### **Shafter-Wasco Irrigation District**

(SWID) was formed in 1937 and is located in Kern County about 20 miles northwest of Bakersfield. Currently, SWID is comprised of 38,766 acres, of which 32,000 are irrigated. Included within its boundaries are the cities of Shafter and Wasco covering approximately 2,400 acres. SWID entered into a long-term contract with Reclamation in 1955 for 50,000 af/y of Class 1 and 39,600 af/y of Class 2 water. SWID does not have any other long-term surface water supplies. SWID provides water for agricultural use only.

SWID obtains its CVP water supplies from two turnouts on the FKC at MP 134.4 and 137.2. The distribution system is .3 miles of lined canals and 117 miles of pipeline. SWID does not own or operate any water storage facilities or groundwater extraction facilities. Landowners must provide wells to meet irrigation demands when SWID does not have adequate surface water supplies available. The main crops in SWID are almonds, cotton, alfalfa, nursery stock, grains, grapes, blackeye peas and carrots. SWID has a history of transferring small amounts of water to neighboring districts.

### **Southern San Joaquin Municipal Utility District**

(SSJMUD) was formed in 1935 and is located in Kern County, approximately 75 miles southeast of Fresno and 30 miles northwest of Bakersfield. The Delano and McFarland are within its boundaries but are not serviced by SSJMUD. Currently, SSJMUD is comprised of approximately 61,000 acres, of which 47,000 are irrigated. SSJMUD entered into a long-term contract with Reclamation in 1945 for 97,000 af/y of Class 1 and 50,000 af/y of Class 2 water and does not have other long-term surface water supplies.

SSJMUD obtains its CVP water supplies from nine diversion points on the FKC between MP 119.6 and 130.4. The distribution system is 158 miles of pipeline. SSJMUD operates eleven regulating reservoirs that provide groundwater recharge. Poso Creek and other smaller foothill drainages provide recharge to the groundwater. SSJMUD does not own and operate groundwater production facilities. Landowners must provide well to irrigate during times when SSJMUD does not have surface water supplies available to meet irrigation demands. The main crops in SSJMUD are alfalfa, citrus, grapes, cotton, nuts and barley. SSJMUD does not typically transfer water in or out.

### **Stone Corral Irrigation District**

(SCID) was formed in 1948. SCID is located in Tulare County, approximately 30 miles southeast of Fresno and 10 miles north-northeast of Visalia. SCID's longest portion, north to south, is 3 ¼ miles and its greatest width, east to west, is 3 miles. SCID is comprised of 6,488 acres, of which 5,470 acres are irrigated. SCID entered into a long-term contract with Reclamation for 7,700 af/y of Class 1 water in 1950. In 1991, the contract was amended to 10,000 af/y of Class 1 water. SCID receives a small amount of water through exchange arrangements with CVC Contractors. This amount is 950 af/y of CVP water. The safe yield for the groundwater supply in SCID is approximately 3,200 af.

The FKC runs approximately along the north and east boundaries. SCID obtains the CVP water from the FKC at MP 57.90, 59.33, 60.90 and 62.68. The conveyance system is 27 miles of

pipeline. SCID serves only agricultural water. The main crops are citrus, cotton, deciduous and subtropical fruit.

### **Tea Pot Dome Water District**

(TPDWD) was formed in 1954 and is located in southeastern Tulare County, approximately three miles south of Porterville. TPWD is comprised of 3,282 acres, and all are irrigated. TPDWD relies mostly on their CVP contract water supplies.

In 1958, TPDWD entered into a long-term contract with Reclamation for 7,500 af/y of Class 1 water. TPDWD does not have any other long-term surface water supplies. TPDWD does not own or operate groundwater recharge or extraction facilities. Landowners pump small amounts of groundwater. TPDWD receives its CVP water supplies from its turnout on the FKC. The distribution system is 20 miles of pipeline. The main crops are citrus and olives.

### **Terra Bella Irrigation District**

(TBID) was formed in 1915 and is located in Tulare County about 75 miles southeast of Fresno and about eight miles south of Porterville. Deer Creek flows westerly and passes through the northern portion. Fountain Spring Gulch flows in a northwest direction, traversing a portion of TBID. TBID is comprised of 13,962 acres, of which, 11,165 are irrigated. The town of Terra Bella is located within TBID's boundaries with an estimated population of 3,870. TBID provides CVP and groundwater CVP for domestic purposes and to the town of Terra Bella.

Approximately 850 af/y of CVP water is delivered for domestic, municipal and industrial uses within TBID.

TBID entered into a long-term contract with Reclamation in 1950 for 29,000 af/y of Class 1 water. TBID receives its CVP water supplies from the FKC at MP 103.64, MP 102.69 and Deer Creek to a percolation pond. The distribution system is 152 miles of pipeline. TBID does not have any other long-term surface water supplies.

TBID's deep well system is barely adequate to support small winter demands. Historically, there were a total of 83 wells drilled over the years in TBID. Currently, TBID owns and operates 10 wells. Recently, TBID has lost the use of three wells due to chemical contamination. TBID is losing its groundwater supply. There are no significant grower or landowner wells. TBID uses three regulating reservoirs during the irrigation season and are also used for storage in the winter. Station 1 has a capacity of 0.185 million gallons, Station 2 has 0.212 million gallons and Station 3 has a 1.880 million gallon capacity.

TBID has developed groundwater banking arrangements with other districts. Groundwater banking arrangements have enabled TBID, a groundwater deficient district, to produce crops during drought years. In years when surplus amounts of water are available, TBID transfers water to other districts for direct use, resale, or percolation through recharge basins. TBID and Lower Tule River Irrigation District have a long history of water exchanges. TBID transfers water to Lower Tule River Irrigation District and, in turn, transfers water to TBID in dry years. TBID provides agricultural water, in addition to, municipal and industrial water for domestic use. The main crops are nuts, deciduous fruit orchards, and citrus.

### **Tulare Irrigation District**

(TID) was formed in 1889 and is located in western Tulare County on the eastside of the San Joaquin Valley. TID currently comprises of 70,000 acres, of which, approximately 62,000 are irrigated. The city of Tulare lies on the eastern portion at the intersection of the Southern Pacific and Santa Fe Railroads and on U.S. Highway 99. TID provides only agricultural water supplies and does not service the city of Tulare. Water for Tulare is extracted from the ground and furnished through City owned facilities.

TID entered into a long-term contract with Reclamation in 1952 for 30,000 af/y of Class 1 and 141,000 af/y of Class 2 water. TID has pre-1914 water rights on the Kaweah River for approximately 50,000 af/y of water. TID's owned Kaweah River water rights are 1) Crocker Cut on the Lower Kaweah Branch, 2) St. Johns Canal (TID) on the St. Johns Branch and 3) Crossmore cut Packwood Creek) on the St. Johns Branch. Water is also made available through share holdings in the following Kaweah River agencies: 1) Tulare Irrigation Company on both the Lower Kaweah Branch and the St. Johns Branch, Wutchumna Water Company on the Kaweah River, 4) Persian Ditch Company, and 5) Consolidated Peoples Ditch Company. Groundwater recharge occurs from percolation in the canals and natural channels, recharge basins, and treated municipal and industrial effluent. TID has 12 groundwater recharge areas covering a total of 1,110 acres. TID does not operate extraction wells.

TID obtains their CVP water supplies from its turnout which is located approximately 14 miles northeast of the District Service Area. The water is conveyed in TID's Main Canal. Diversions into this Main Canal include water from the Kaweah and St. Johns River Branch. The Packwood Creek diversion system begins at the terminus of the Lower Kaweah River approximately 10 miles northeast of TID. The distribution system includes 300 miles of unlined canals, ¼ mile of lined canal and 30 miles of pipeline. The main crops in TID are alfalfa, field corn, wheat and cotton.

# Appendix E – Other CVP Contractors, SWP Contractors, and non-CVP Contractors

## **Buena Vista Water Storage District**

Buena Vista Water Storage District (BVWSD) lies in the trough of the southern San Joaquin Valley in Kern County. The District lands are within a portion of the lower Kern River watershed, where historic runoff created the heavy clay soils from former swamp and overflow lands north of Buena Vista Lake. The area lies on the west side of the valley floor, about 16 miles west of the city of Bakersfield. The unincorporated town site of Buttonwillow (population 1,500) is situated in the geographical center, however BVWSD does not supply any M&I water. The water service area contains 48,443 acres of agricultural land. Approximately 45,500 acres have been built-out, and about 40,000 acres almost entirely field and row crops.

BVWSD service area is agricultural, with cotton, grain, sugar beets, and alfalfa as the principal crops. Cotton is the dominant crop, comprising about 85% of the annual cropping pattern. Total crop consumptive use peaked in the 1970s, averaging about 113,000 acre-feet. In the past 10 years consumptive use has declined to about 105,000 acre-feet.

In addition to Kern River water supplies BVWSD contracted with DWR via the Kern County Water Agency for an additional surface water supply in 1973. This contract provided for an annual firm supply of 21,300 af and surplus supply of 3,750 af. BVWSD has also been a historic user of surplus FKC flows to serve irrigation demands and for groundwater recharge programs. BVWSD is geographically located adjacent to the California Aqueduct and low in elevation on the Kern River Fan. BVWSD's Kern River supply is thus delivered by gravity from its origin in the Sierra-Nevada Mountains north east of Lake Isabella. BVWSD is a member unit under KCWA. Other members of KCWA in the Bakersfield area also have contracted for SWP water but must pump their supplies to their service areas upslope and to the east of the San Joaquin Valley via the CVC. These circumstances lend themselves to an exchange of BVWSD Kern River water for east side member units SWP water, thus avoiding or reducing energy use and resultant pumping costs. This process also frees up CVC capacity that would otherwise be necessary for transportation of east side member units of SWP water. In order to allow maximum benefit from these exchanges, BVWSD has increased its SWP capacity by construction of a three pipe siphon Aqueduct Turnout (BV-7) having a capacity of 300 cfs. BVWSD Aqueduct capacity can now provide approximately 85-90% of peak system demand with a total flow capacity from the California Aqueduct of approximately 800 cfs. Although the exchange programs have provided benefits to BVWSD, salt loading is an issue since SWP water supplies carry more salinity than Kern River water. This would influence the degree of exchange volume in particular years when salinity levels are greater.

BVWSD engages in water banking programs. These banking programs generally fall under two categories. The first category would be a program designed to return water to BVWSD during a dry year when supplies are restricted. The second category would be a program where BVWSD is providing a banking and extraction service for monetary payment or similar benefits. BVWSD wet year supplies have afforded it the ability to enter into both categories of banking programs

which in turn allow BVWSD to stretch its wet year supplies into dry year payback deliveries and thus help to balance required groundwater pumping. These programs also allow BVWSD to make more efficient use of its Kern River water supplies over the long term which in turn minimizes the loss of water from the critically overdrafted groundwater basin. BVWSD also engages in direct groundwater recharge programs. BVWSD Kern River supply is dependent on the hydrologic cycles as they occur regardless of crops demands. During dry years, landowners must provide the difference between crop demands and BVWSD allocated surface deliveries via groundwater pumping from individual wells. During wet years BVWSD is able to satisfy maximum crop demands that eliminates the use of landowner wells. Excess wet years are stored to maximize surface carryover use and followed by direct recharge, to the maximum extent possible to replenish the groundwater supply. The efficiency of managing this difference between crop demands and available water supplies ensures that BVWSD, as a whole, is in positive balance with the groundwater basin. The main recharge areas used by BVWSD below the Enos Lane are the Kern River Bypass Area, the Kern River channel, the Main Canal, the Outlet Canal, the Tule Elk Reserve area near Tupman, and the upper reach of the Kern River Flood Channel. Recharge capacity has nearly doubled in the Kern River Bypass Area due to improvements in the West Kern/Buena Vista banking program, and in the Tule Elk Reserve area via additional distribution facilities in sloughs and other low lying areas. In addition, BVWSD is a recharge participant in the KCWA Pioneer Project and shares a first priority access to the total recharge capacity for overdraft correction.

Historically, BVWSD stored its spring runoff flows within Buena Vista Lake until the lake bottom lands were freed from the storage right in exchange for conservation storage space in Lake Isabella. This storage space was purchased by the Kern River Interests upon construction of Isabella Dam by the USACOE. BVWSD owns 31.6% of the conservation storage space within the reservoir with flood control being the only overriding purpose. This affords a maximum storage increment of 172,000 af of regulation space with a maximum winter carryover capability of 68,800 af. BVWSD also retained storage rights within the cells of Buena Vista Lake with a yield, after losses, of approximately 25,000 af. Pursuant to the Kern River Storage and Use of Water Agreement, BVWSD is afforded use of this facility for wet year storage of excess Kern River supplies. In addition, BVWSD, via agreement with Kern County maintains regulation storage use of 1,800 af of space within Buena Vista Aquatic Recreation Area Lakes. Therefore, BVWSD has approximately 96,000 af of surface storage space for regulation of its surface water supplies from one year to the next. These surface storage rights are very important to the efficient management of BVWSD's Kern River water rights since the April-July runoff period does not coincide with the crop irrigation requirement which occur in the January through March pre-irrigation and the June through September summer irrigation periods. The carryover capability with Isabella reservoir and BVWSD's SWP supply allow BVWSD to provide a surface water supply for the early pre-irrigation period even though BVWSD's Kern River supply normally does not begin until the Mar-August supply period. The reservoir also provides peaking capability and facilities other management practices such as the previously mentioned exchange, banking, and recharge activities

The Buena Vista Aquatic Recreational Area lakes provide the BVWSD with a very useful tool in the operational storage for regulation of both Kern River and SWP flows to the BVWSD as well as some valuable surface storage. This facility receives the BVWSD's Kern River flow via the

Alejandro Canal and SWP flow via turnout BV-3 while directing flows in the BVWSD's Outlet canal for use in the Buttonwillow service area. The lakes are also used to serve the Maples area and Henry Miller Water District per agreement with Kern County and upon arrangement with BVWSD.

During wet years the BVWSD authorizes the sale of surplus water to reduce or avoid groundwater pumping and generate revenue to offset BVWSD operating costs. Generally, surplus water is offered to landowners within the BVWSD (for use above surface allocation), to landowners adjacent to the BVWSD who rely primarily on groundwater supplies, and other non-adjacent parties. Such deliveries are beneficial since they correct overdraft, raise pumping levels, and generate revenues.

Historically there have been threatened and endangered species present within the bounds of BVWSD. The giant kangaroo rat (*Dipodomys ingens*) was known to exist in the southernmost portion of BVWSD, but has not been sighted in recent times. The giant garter snake (*Thamnophis gigas*) was located in BVWSD in a 1999 survey. The western yellow billed cuckoo (*Coccyzus americanus occidentalis*) was last reported in BVWSD in 1973. Two accounts of the buena vista lake shrew (*Sorex ornatus relictus*) were made in BVWSD in 1991. The blunt-nosed leopard lizard (*Gambelia sila*) was last observed in BVWSD in 1987. The western snowy-plover (*Charadrius alexandrinus nivosus*) was last seen in BVWSD in 1978.

### **Cawelo Water District**

Cawelo Water District (CWD) is located in the North-Central portion of Kern County and encompasses an area of nearly 45,000 acres. The CWD lies between State Highway 99 on the west and State Highway 65 on the east, the community of McFarland on the north and Oildale on the south. The city of Bakersfield is approximately six miles southeast of CWD.

As of 2000, the total area of CWD was 45,079 acres including a service area of 33,320 acres. Land use in 2000 in the service area consisted of 29,657 acres of irrigated agriculture, 3313 acres of fallow and 350 acres devoted to other uses including waterways, residential, commercial and agriculture-related businesses.

Approximately 85% of the irrigated lands served by CWD are planted to trees and vines (principally grapes, citrus, deciduous fruit, and nuts).

CWD surface water supply is obtained primarily under two long-term contracts: a contract with the Kern County Water Agency for SWP water and a contract with the city of Bakersfield for Kern River water. Water from these two sources has accounted for 90% of CWD's surface water supplies. CWD also purchases water from many other sources under short-term agreements as available. The imported surface water serves as a supplemental supply for irrigation within CWD. Approximately 65% of the irrigation demands within CWD have been satisfied with imported surface water deliveries. CWD does not serve M&I water. Individual landowner wells have contributed to the remainder of the water required to irrigate crops. CWD obtains surface water from other sources including diversions from Poso Creek when available, oil-field produced water, and CVP water through one-year temporary water service contracts when available.

Within the bounds of CWD, the only threatened or endangered species that has been sighted in recent times is the San Joaquin kit fox (*vulpes macrotis mutica*). This species was last observed in CWD in 1986.

### **St. Johns Water District**

Encompasses in part or in total of the Kaweah River water rights of Jennings Ditch Company, Modoc Ditch Company, Goshen Ditch Company, and St. Johns Ditch Company.

### **Kaweah Delta Water Conservation District**

The Kaweah Delta Water Conservation District (KDWCD) was formed in 1927, under the provisions of California state law known as the Water Conservation District Act of 1927, for the purpose of conserving and storing waters of the Kaweah River and for conserving and protecting the underground waters of the Kaweah Delta. Later the Water Conservation District Act, as well as the purpose of KDWCD, was expanded to include power generation.

KDWCD is located in the south central portion of the San Joaquin Valley and lies in both Tulare and Kings Counties. It fully encompasses the growing cities of Visalia, Farmersville and Tulare. The population of the KDWCD is currently estimated to be in excess of 150,000 people. The total area of KDWCD is about 337,000 acres with approximately 255,000 acres located in western portion of Tulare County and the balance, or about 82,000 acres, in the northeastern portion of Kings County. KDWCD is comprised of four districts that are entirely or partially within KDWCD boundary and are listed below:

### **Lakeside Irrigation District**

Discussed elsewhere within the Appendices.

### **Kings County Water District**

Discussed elsewhere within the Appendices.

### **Corcoran Irrigation District**

Corcoran Irrigation District encompasses the area around the town of Corcoran, at the eastern edge of Kings County and receives CVP water via the Kings River where it is diverted out of the FKC. Corcoran Irrigation District diverts the CVP water out of the Kings River into the Lakeland/Highline Canal that enters at Kansas Avenue. In addition, water can enter the Kaweah/St. John River system and can be diverted into Cross Creek which will enter at Kansas Avenue. There are no recorded occurrences of threatened or endangered species in Corcoran Irrigation District.

### **Tulare Irrigation District**

Discussed elsewhere in the Appendices.

### **Kaweah Delta Water Conservation Water District**

KDWCWD lands are primarily agricultural, although the cities of Visalia and Tulare constitute significant areas of urbanization. Farmersville is the other incorporated area. Smaller unincorporated rural communities include Goshen, Ivanhoe, Waukena, and Guernsey.

A high degree of agricultural development exists in the KDWCD, with approximately 266,000 acres presently devoted to the production of a variety of irrigated crops, 3,200 acres idle or fallow (including roads and canals), 13,000 acres in farmsteads, 23,300 acres undeveloped and approximately 31,500 acres of urbanized land. The principal crops are cotton, miscellaneous field crops, deciduous fruit and nut trees and alfalfa.

KCWCD encompasses the alluvial fan of the Kaweah River, extending about 40 miles in a southwesterly direction from the foothills of the Sierra Nevada Mountains on the east to the center of the San Joaquin Valley in the vicinity of the Tulare Lake bed on the west. KDWCD is generally bounded on the north and west by the service area of the Kings River and on the south by the service area of the Tule River.

Numerous public and private entities within KDWCD's boundaries divert water from the Kaweah River and its distributaries. Nearly all of the lands served with Kaweah River water also use groundwater wells to supply irrigation water, primarily due to the erratic, relatively undependable, nature of flow on the Kaweah River. All municipal and industrial water uses within KDWCD are supplied from groundwater.

Terminus Dam and Lake Kaweah, located on the Kaweah River about 3.5 miles to the east of KDWCD, was completed in 1961 by the USACOE. This project was constructed for flood control purposes on the Kaweah River and to provide river control and water conservation for irrigation purposes. KDWCD has a contract with the United States for repayment for the project costs allocated to water conservation. The reservoir currently holds about 143,000 acre-feet, with construction underway to expand capacity to 183,300 acre-feet.

KDWCD and its sub-entities have historically received substantial quantities of water surplus to the needs of CVP Contractors. Over the past 50 years, an excess of 5 million acre-feet of CVP water has been imported into KDWCD. KDWCD and the Kaweah River groundwater basin have experienced long-term groundwater overdraft estimated in 1972 to be 89,000 acre-feet per year. KDWCD is currently undergoing new studies of groundwater data to determine the extent and volume of groundwater overdraft within its boundaries. There are currently 40 recharge basins within KDWCD covering approximately 5,000 acres. While KDWCD owns and operates many of the groundwater recharge basins, it does not provide water-banking services for others. Conversion of land from agricultural uses to urban/commercial uses has occurred, is occurring and is expected to continue to occur in these communities consistent with the general plans and zoning for these communities as may be amended. While KDWCD owns and operates numerous groundwater recharge basins within its boundaries, it does not provide water banking for others.

### **Kern County Water Agency**

Kern County Water Agency (KCWA) comprises all of Kern County in the Southern San Joaquin Valley. KCWA currently has approximately 861,000 irrigated acres. This is in contrast to its peak to the KCWA's peak irrigation acres, 973,000 acres in 1984 and its lowest recent level of irrigation acres, 729,400 acres in 1991 due to a severe drought. There are about 110,000 to 120,000 acres per year that are idled for various reasons. In an extreme case, if all of this land was cropped in a single year, irrigated acreage could return to its peak without the conversion of

any native lands. In 1991 there were about 266,200 acres of permanent crops and in 1998 permanent crops amounted to about 316,500 acres. This trend is expected to continue. KCWA was created by a special act of the State Legislature in 1961. It holds the master contract with the State of California for delivery of a maximum yearly supply of 1,000,949 acre-feet of SWP water supplies to 21 subcontracting water agencies (“Member Units”) within Kern County listed below:

<b>Agency</b>	<b>Surface Water Rights/ Contract Rights</b>	<b>Irrigated Acreage</b>	<b>Percent in Permanent Plantings</b>
Belridge Water Storage District	SWP	--	--
Berrenda Mesa WD	SWP	--	--
Buena Vista WSD	SWP, KR	38,411	1%
Cawelo WD	SWP, KR,	34,300	97%
MS, Oilfield waste			
Henry Miller WD	SWP, KR	18,100	0%
Kern County Water Agency Improvement District No. 4	SWP, KR	4,900	0%
Kern Delta WD	SWP, KR, MWD	93,100	7%
Lost Hills WD	SWP	57,600	29%
Rosedale-Rio Bravo WSD	SWP, KR	33,400	17%
Semitropic WSD	SWP, MS MWD	129,100	23%
Tehachapi-Cummings CWD	SWP, local streams	--	--
Tejon-Castaic WD	SWP, local streams	--	--
West Kern WD	SWP	--	--
Wheeler Ridge-Maricopa WSD	SWP, MS	93,600	37%
Arvin-Edison WSD (LTRC)	CVP, KR, MS	99,000	48%
Southern San Joaquin MUD (LTRC)	CVP	50,500	56%
Shafter-Wasco ID (LTRC)	CVP, MS	30,900	48%

Delano-Earlimart ID (LTRC)	CVP, MS	51,000	80%
Kern Tulare WD (LTRC)	CVP, KR	20,202	100%
Rag Gulch WD (LTRC)	CVP, KR	5138	100%

**KCWA Member Unit SWP Supplies**

<b>Member Unit</b>	<b>Supply</b>	<b>Allocation (60%)</b>	<b>Water Shortage</b>
Belridge WSD	121,508	72,905	48,603
Berrenda Mesa WD	108,600	65,160	43,440
Buena Vista WSD	21,300	12,780	8,520
Cawelo WD	45,000	22,920	15,280
Henry Miller WD	35,500	21,300	14,200
Improvement District No. 4	82,946	49,768	33,178
KCWA	8,000	4,800	3,200
Kern Delta WD	25,500	15,300	10,200
Lost Hills WD	119,110	71,466	47,644
Semitropic WSD	155,000	93,000	62,000
Rosedale Rio-Bravo WSD	29,900	17,940	11,960
Tehachapi-Cummings CWD	19,300	11,580	7,720
Tejon-Castac WD	5,278	3,167	2,111
West Kern WD	25,000	15,000	10,000
Wheeler Ridge-Maricopa WSD	197,088	118,253	78,835
<b>Total</b>	<b>998,730</b>	<b>559,238</b>	<b>339,492</b>

Arvin-Edison WSD, Southern San Joaquin MUD, Shafter-Wasco ID, Delano-Earlimart ID, Kern Tulare WD and Rag Gulch WD are LTRC CVP contractors and are within the focus of this EA. Belridge WSD, Berrenda Mesa WD, Tehachapi-Cummings CWD and Tejon-Castac WD are not within the Place of Use under Reclamation's water rights permits for this action, therefore are not included in this Environmental Assessment or Proposed Action. Henry Miller WD and West Kern WD have small portions within the CVP Place of Use. Approvals of exchanges with these two districts could occur only after considering the amounts and deliveries involved.

As stated earlier, each proposal would be reviewed individually for compliance with this EA, related biological assessments, applicable laws and policies including Reclamation's water rights permits prior to approval. KCWA Improvement District #4 supplies are M&I water and the remaining districts are agricultural. The KCWA was established to make water available for any beneficial use or uses of lands or inhabitants; provide flood control; drain and reclaim lands; acquire, appropriate, store, conserve and import water; prevent contamination of water; develop and sell at wholesale hydroelectric energy to aid in financing water projects.

KCWA is the largest agricultural water contractor on the SWP and the second largest overall with 1,000,949 acre-feet of annual supply. Kern County ranks in the top four California counties in agricultural production, behind Fresno, Tulare and Monterey Counties. For the year 2000, the last year for which statistics are available, Kern County agricultural production was valued at \$2.2 billion. Grapes were the biggest crop with a value of \$438 million, followed by citrus at \$291 million and cotton at \$226 million.

Kern County leads the state in production of several crops including almonds, pistachios, carrots, watermelons, sheep and wool. Agriculture has been Kern County's number one industry for many years. Approximately one out of every four jobs in Kern County is related to agriculture. Kern County has a total population of 662,000 people. Bakersfield, the largest incorporated city in the county has a population of 247,000 people.

<u>City Population</u>	
McFarland	9,600
Delano	38,800
Shafter	12,700
Wasco	21,200

Buena Vista WSD, Cawelo WD, Kern Delta WD, North Kern WSD, Rosedale-Rio Brave WSD, and Semitropic may enter into exchange arrangements with the Cross Valley Contractors under separate agreements and are described elsewhere in this Section.

#### Improvement District No. 4

In the late 1960's KCWA formed it Improvement District No. 4 to import state project water to the urban Bakersfield area for municipal purposes. Today, more than 80,000 af/y of SWP water is reserved for importation into the area. Fifty-thousand af/y is set aside to replenish ground water basins, while 34,000 af is treated and distributed through KCWA's Henry C. Garnett Water Purification Plant. The treated water is delivered to four domestic water systems that serve parts of northern and eastern Metropolitan Bakersfield through the following entities:

Within the boundaries of the Kern County Water Agency ID #4 are San Joaquin woollythreads (*Monolopia congdonii*), Bakersfield cactus (*Opuntia basilaris* var. *treleasei*), San Joaquin kit fox (*Vulpes macrotis mutica*) and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). These species were last reported in 1992, 1995, 1986 and 1991 respectively.

#### Wheeler Ridge-Maricopa Water Storage District

Wheeler Ridge-Maricopa Water Storage District (WR-MWSD) is a public agency whose jurisdiction encompasses about 147,000 acres of land in Kern County at the extreme southern end of the San Joaquin Valley twenty miles south of Bakersfield. A large portion of the WR-MWSD is within the designated Places of Use as defined in Reclamation's Water Rights Permits. WR-MWSD provides irrigation water supplies to about 90,000 acres of farmland within its boundaries. A small percentage of the water is supplied on a temporary basis for industrial, groundwater recharge, and in-lieu of groundwater pumping purposes. WR-MWSD provides no water treatment or M&I service. Except for a few locations along Interstate 5, WR-MWSD is exclusively rural. There are no cities or towns within MR- MWSD boundaries. No significant new water distribution facilities have been constructed since 1986, and none are planned.

WR-MWSD is a member unit of the KCWA and has contracted with KCWA for a water supply from the SWP. Water from the SWP is delivered to WR-MWSD through the California Aqueduct which transects WR-MWSD from west to east. Water from the SWP is the primary source of supplemental water utilized by WR-MWSD. Other sources have included banked water from the various banking programs in Kern County in which WR-MWSD participates including the Kern Water Bank, the Pioneer Project, and the Berrenda-Mesa Project. Direct delivery of water from the CVP is accomplished by releases from the terminus of the FKC into the Kern River channel. Water released to the Kern River can either be conveyed directly to the Kern Water Bank Canal or diverted into the River Canal and delivered downstream to the Kern Water Bank Canal. From the Kern Water Bank Canal the water is conveyed to the California Aqueduct and thence into WR-MWSD turnout and pipeline facilities located along the California Aqueduct.

Most of the WR-MWSD water supply is distributed to 72,074 acres of farmlands within its Surface Water Service Area under the terms of recorded long-term agricultural water service contracts. Current facilities can also provide temporary water service to about 18,000 acres of farmlands. An additional 20,000 acres of farmlands and 10,000 acres of other developed lands rely primarily on groundwater supplies. Another 27,000 acres are undeveloped and used primarily for grazing. The primary use of the CVP water by WR-MWSD would be for delivery into the various banking programs for later recovery and use.

#### KCWA WATER SUPPLY

SWP - KCWA is the second largest participant in the SWP, a water storage and delivery system of reservoirs, aqueducts, power plants and pumping plants. The project, which extends for more than 600 miles (two-thirds the length of California), was planned, built, and is operated by the California Department of Water Resources. About \$4 billion have been spent on project construction.

The project's main purpose is to store water during wet periods and distribute it to areas of need in Northern California, the San Francisco Bay area, the San Joaquin Valley, and Southern California. The State has contracts to supply up to 4.2 million acre-feet annually of SWP water to 29 public agencies. Other project functions include flood control, power generation, recreation, and fish and wildlife enhancement.

The first deliveries of water from the project to Kern County began in 1968. KCWA has contracted to receive a maximum yearly supply of 1,000,949 acre-feet of water. Of that amount, 134,000 acre-feet is allocated to municipal and industrial use, and 866,949 acre-feet is used for agricultural use. Water from the SWP reaches Kern County through the California Aqueduct which passes through the west side of Kern County before crossing the Tehachapi Mountains into Southern California. A portion of that water is brought to Bakersfield and other eastern portions of the San Joaquin Valley through a series of seven pumping stations in the 22-mile long Cross Valley Canal operated by the KCWA.

CVP - The FKC is an essential part of the Kern County agricultural water supply system. It delivers more than 400,000 acre-feet per year to DEID, SJMUD, SWID, AEWSD, KTWD and RGWD.

Kern River - The Kern River supplies water for agriculture, municipal use, industrial use and hydroelectric power. Flows average 700,000 acre-feet yearly or about 22% of the water for Kern County users. The Kern River originates in two forks near Mt. Whitney in the southern Sierra Nevada Mountains and flows south. A large dam has been constructed to form Lake Isabella. The Kern River is the largest local source of surface water in Kern County. Districts that have water rights include, KDWD, City of Bakersfield, BVWSD, Henry Miller Water District, Olcese Water District, and La Hacienda Inc. Kern River water is also delivered to Rosedale Rio-Bravo Water Storage District, Cawelo Water District, Kern-Tulare Water District, Rag Gulch Water District and the KCWA's Improvement District No. 4.

### Agricultural Use

Kern County is the fourth most productive agricultural county in the nation. A semiarid region, it must rely on adequate imported water supply. A vast underground water basin supplies 43% of the water used for domestic and agricultural purposes. Other sources of supply include the Kern River (22%), the SWP (23%), and the FKC (11%). With years of flood and years of drought spaced among periods of normal supply, careful management practices have been developed and applied. Kern County farmers are among the most efficient water managers in the state. It is estimated that 75% of the water applied to local crops goes to satisfying actual crop requirements. Significant improvement in efficient irrigation has been made through the utilization of drip and low volume application methods, as well as careful management of row and border systems. Laser leveling helps achieve uniform distribution. Researchers have determined that irrigation practices in Kern County are among the most efficient in the nation. With national and worldwide demands for food and fiber increasing, the water and agricultural industries of Kern County will continue to develop efficient technologies to meet future irrigation requirements.

### Groundwater

Sediments that comprise Kern County's main groundwater basin are unconsolidated deposits of Tertiary and Quaternary age, including alluvium, lacustrine, deltaic and flood basin deposits of sand and gravel. Thin lenses of silt and clay are scattered throughout the basin at various depths, but are most pronounced in the southwestern and northwestern portions of the Tulare Lake Basin. This basin is located within the Tulare Lake hydrologic region and is bounded on the north by the Kern County line, on the east by the Sierra Nevada foothills, on the south by the Tehachapi and San Emigdio Mountains and on the west by the coast ranges. The Kern River is the principal watershed drainage. The main groundwater basin in the San Joaquin Valley portion of Kern County covers about 963,000 acres. KCWA estimates total storage capacity of the top 500 feet is about 50 million acre-feet. Total groundwater in storage within this space is estimated at 40 million acre-feet, with about 10 million acre-feet of dewatered storage space.

The main San Joaquin Valley basin has two primary water bearing zones; an unconfined zone generally above the Corcoran Clay and a confined zone generally below the Corcoran Clay. There are multiple confined zones in some parts of the valley. The southeastern corner of the Valley contains the White Wolf basin, which is separated from the main Kern County basin by the White Wolf Fault. In the northeastern portion of the basin some groundwater production occurs in the Santa Margarita and Olcese formations. These deep, confined aquifers are on the edge of the Valley with limited yields and marginal to poor groundwater quality.

Natural recharge of the groundwater basin is estimated to be about 180,000 acre-feet annually. Annual groundwater pumping exceeds the natural recharge of the basin. The conjunctive use of surface and groundwater supplies has increased the operational yield of the groundwater basin to about 2 million acre-feet annually. There are about 5,500 to 6,000 active groundwater wells in the Kern County groundwater basin. Basin yield varies across the valley. The lowest pump yields are in the northeastern portion of the valley, and the highest yields are typically in the Kern Fan area. Typical yields may vary from about 700 gallons per minute to over 3,000 gallons per minute (Management Plan, October 2001).

KCWA has an allocated Aqueduct capacity of 3,277 cfs. Along both sides of the Aqueduct within the Kern County portion of the DWR San Joaquin Field Division are a number of Member Unit turnouts used to convey water from the Aqueduct into each district delivery system. Following is a list of the Member Units and number of turnouts: Semitropic WSD - 2; Buena Vista WSD - 6; Cawelo - 11; Rosedale Rio-Bravo WSD - 12; Henry Miller WD- 23; Wheeler Ridge-Maricopa WSD - 17. The Aqueduct is used to convey water including the transfer and exchange water, to Kern Tulare Rag Gulch.

Recovered groundwater that is conveyed to the California Aqueduct, can be delivered to districts or exchanged with the DWR. Exchanges with the DWR can be simultaneous, or delayed exchanges. In a simultaneous exchange water delivered from the Aqueduct to an upstream district at the same time the recovered groundwater is transported to the Aqueduct. With a delayed exchange, water might be delivered by the DWR to the receiving district from storage before or after the recovered groundwater is received.

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1 Cawelo WD takes delivery of SWP water via the CVC.

2 Rosedale-Rio Bravo WSD takes delivery of their SWP water via the CVC.

3 Henry Miller WD takes their SWP water via Buena Vista turnouts.

### Recovery

The CVC is also used to convey banked groundwater after it is recovered. Once in the CVC, recovered water can be delivered to CVC participants in exchange for water in the California Aqueduct. During periods when water is not available for exchange, the CVC can be operated in reverse flow. When operated in reverse flow, water flows from the CVC directly into the California Aqueduct. In 1991, water levels in the Aqueduct were low enough for the flow to be by gravity. When water levels in the California Aqueduct are too high for gravity flow, the water must be pumped into the Aqueduct. In 1992, the DWR constructed a temporary pump station to lift 80 cfs from the CVC into the California Aqueduct. A similar station may be reconstructed in the future if reverse flows into the California Aqueduct are needed when levels in the California Aqueduct are too high for gravity flow. In addition, raising the lining in the CVC reach adjacent to the California Aqueduct would allow reverse flow without a pump station.

It should be noted that depending on groundwater pumping operations, water in the Buena Vista Aquatic Lake may contain high concentrations of arsenic. These high concentrations are caused when groundwater from nearby wells is pumped into the Buena Vista Aquatic lakes for agricultural use and to make up evaporation losses.

### Potential Sources of Exchange Water

The KCWA member units have access to the following potential sources of water that could be exchanged for CVP water supplies:

1. SWP water – Accessed from turnouts along the California Aqueduct and subsequently from public and privately owned canals and pipelines that transport the water for use within Kern County.
2. Kern River water – Accessed from existing turnouts and diversion points along the Kern River and related public and privately owned canals and pipelines that transport the water for use within Kern County, or through additional exchange to CVP surface water supplies.
3. Poso Creek, Caliente Creek or other minor streams within Kern County – Existing points of diversion are within Cawelo WD, Semitropic WSD, Kern Delta WD, Henry Miller WD, Arvin-Edison WSD and portions of Wheeler Ridge-Maricopa WSD.
4. Kaweah, Tule, St. Johns and Kings River water – Historically has been available to Kern County NLTC via diversion of flows at established points of diversion into the FKC and into the Kern River.
5. Groundwater – Exchanges involving groundwater could occur virtually anywhere within the Kern NLTC area, including groundwater recharge and recovery facilities, which have access directly or through additional exchange to CVP surface water supplies. Groundwater banking is not included in this analysis and separate NEPA review would be needed.

### Potential Scope of Exchange Water Deliveries

The distribution systems in Kern County are heavily interconnected. The Cross Valley Canal interconnects the SWP, Kern River and Friant-Kern systems. The SWP is further interconnected with the Friant-Kern system via Arvin-Edison WSD's turn-in/out to the California Aqueduct. Also, most of the KCWA member units have distribution systems which are interconnected with the distribution systems of neighboring districts. As an example, Semitropic Water Storage District and Shafter Wasco Irrigation District have a pipeline interconnection which can move water directly from the California Aqueduct through Semitropic's distribution system and into Shafter-Wasco, a Friant long-term contracting district. In reverse, water from the FKC can be moved through Shafter-Wasco directly to Semitropic, a non-long-term CVP district and a SWP contractor.

Natural streams also provide conveyance capability to facilitate exchanges. As an example, Poso Creek, itself a source of potential exchange supplies, traverses a couple of districts (and the Kern National Wildlife Refuge) and has served as a conveyance vehicle of CVP supplies in the past. All of these interconnections can be used to directly or indirectly deliver exchange water. This illustrates the potential for exchanges between various entities within Kern County and those elsewhere within the CVP or the SWP. As an important aside, several facilities exist which can be used to deliver water to the Kern National Wildlife Refuge. While CVP supplies or purchased non-CVP supplies available to the KNWR are not typically available to water districts, exchanges have historically been done with the KNWR to provide water to the refuge on their

preferred demand pattern. Additional exchanges have been offered and considered with the KNWR where refuge supplies could be delivered and stored in the groundwater of KCWA districts and subsequently returned from groundwater or other surface supplies back to the KNWR on its preferred demand schedule. There may be monetary or water resource gains associated with facilitating such exchanges. CVP water from the Friant Division cannot be used for wildlife habitat since the water rights permits do not include fish and wildlife or their habitat as a purpose of use. This EA does not cover exchanges to refuges and separate NEPA analysis would be required.

### **Kern Delta Water District**

Kern Delta Water District (KDWD) is located in the southern portion of the CVP Service Area, directly south of City of Bakersfield, and west of Arvin-Edison. Two major highways, Interstate 5 on the west and State Highway 99 on the east, join at KDWD southern boundary. To the west, KDWD's border roughly follows the Buena Vista Canal, while its eastern border is located west of the City of Arvin (population approximately 13,000 in 2000). KDWD encompasses the historic Kern Lakebed. KDWD comprises of 129,000 acres which are primarily agricultural but also encompassing about 5,000 acres of residential and commercial land uses. Most urban areas are found in the north portion of Kern Delta, where the City of Bakersfield is slowly growing to the south. In addition, there is sparse urban development along the two major east-to-west roads (Panama Land and Taft Highway). Land use south of the City of Bakersfield is mainly agricultural (87%), but there are about 8,000 acres dedicated to petroleum extraction. Planned suburban and commercial development is generally focused on the areas immediately south of Bakersfield.

Major infrastructure in Kern Delta consists of two oil fields: the Ten-Section Oil Field on the west, south of Panama Lane, and a much smaller oil field just south of Panama Lane near the town Lamont at the eastern edge of Kern Delta. There are a number of oil and gas pipelines running through KDWD and several major power line easements. The Arvin-Edison Canal runs through portions of the northern end of Kern Delta, connecting to five existing irrigation canals that serve Kern Delta growers. From west to east, these existing earth-lined canals are the Buena Vista, Stine, Farmers, Kern Island Main, Kern Island Central, and Eastside Canals. All but the Kern Island Main and Eastside Canals generally follow the alignment of historic streams. Lands north of Bear Mountain Blvd, within KDWD, are covered in the Metropolitan Bakersfield Habitat Conservation Plan which has been completed. Kern County is currently developing a HCP which encompasses the remaining lands in KDWD.

### **Kern Water Bank Authority**

The Kern Water Bank Authority (KWBA) located in the southwestern San Joaquin Valley, occupies approximately 30 square miles (20,000 acres) of land in Kern County.

The primary purpose of the KWBA is to recharge, store and recover water (water banking) in order to improve the water supply for its participants during periods of water shortages. It also conducts other activities that include farming and habitat management.

The KWBA is a Joint Powers Authority comprised of six subcontracting water agencies, as listed below. All members of the KWBA have a contract, either directly or indirectly, for water from

the SWP. KWBA provides the mechanism to help mitigate the various reliability problems inherent in the SWP. The following are Kern Water Bank Authority Member Units:

Dudley Ridge Water District	Tejon-Castac Water District
Kern County Water Agency	Westside Mutual Water Company
Semitropic Water Storage District	Wheeler Ridge-Maricopa Water Storage District

The KWBA operates by recharging surplus water for direct groundwater recharge within recharge basins when it is plentiful. KWBA does not own any of the water recharged onto the property. All water is owned by the participants purchasing and recharging the water to maintain balance of water supplies. As such, KWBA does not use its banked water for growing crops, although its member districts do use the water for farming within their districts. The majority of KWBA land, 17,000 of the 20,000 acres were farmed intensively prior to 1991. Currently, the water conservation activities of the water bank are allowing re-establishment of intermittent wetland and upland habitat. The CVP water, if approved, would be delivered for recharge of the aquifer. KWBA receives FKC water via the CVC or the Kern River. Both the CVC and Kern River will then convey the water to the Kern Water Bank facilities for groundwater storage until needed by the Kern Water Bank participants. When the stored water is requested by the KWBA participants, the water can be pumped from the ground and delivered through the Kern Water Bank canal, CVC and the California Aqueduct directly or by exchange to the participant's service areas so long as they are within the Place of Use boundaries as defined in Reclamation's water rights permits.

### **Kings County Water District**

The Kings County Water District (KCWD) was formed in 1954 under the County Water District Act to provide a legal entity for water management in the northeast portion of Kings County. The basic missions of KCWD are:

- 1) Protection, conservation, and stabilization of groundwater.
- 2) Negotiating and contracting for supplemental water.
- 3) Maintaining facilities for surface water distribution for irrigation and groundwater recharge.
- 4) Preserving the existing surface water rights held by mutual water companies through a program of water stock acquisition and retention.

KCWD encompasses the northeastern portion of Kings County, from the Kings River on the north to approximately six miles south of Hanford. To the east, KCWD extends to the County's east boundary, and to the west it extends approximately 5 miles west of Hanford to the eastern edge of the City of Lemoore. KCWD is located in the east central part of the Kings River service area, and is entirely within Kings County. The City of Hanford, with a population of 38,000, lies near the center of KCWD. The total area of KCWD is 143,000 acres, of which 51,150 acres are also within the boundaries of Division 5 of the Kings River Conservation District; 82,610 acres are also within the boundaries of Kaweah Delta Water Conservation District; and 9,240 acres are within the area where the two districts overlap. KCWD's population excluding City of Hanford is 25,000. Although, KCWD boundaries encompass the Cities of Hanford and a portion of Lemoore, KCWD does not supply any M&I water.

KCWD includes portions of the service areas of three major mutual ditch companies. Peoples Ditch Company and Last Chance Water Ditch Company both possess water rights on the Kings River, and Lakeside ditch Company holds water rights on the Kaweah River. KCWD boundary completely encompasses the area of the Lakeside Irrigation Water District, a California water district formed to administer the water rights and distribution system of the Lakeside Ditch Company stockholders, and acquire additional surface water supplies. KCWD also operates and maintains the Riverside Ditch, a conveyance system used to distribute KCWD and People's Ditch Company water.

KCWD has recharge basins that are located near the conveyance systems of the ditch companies in which they own stock. KCWD also uses Old Slough and river channels, and has a continuing program of purchasing and leasing property for groundwater recharge. KCWD currently has over 1,100 acres of artificial recharge area and also uses some 230 miles of unlined canals owned by the ditch companies that contributes to incidental recharge. Maintenance of these recharge basins is performed by KCWD and consists mainly of weed control and efforts to maintain permeability.

The quantity of water used in the recharge program has only recently been totally measured. Critically dry years such as 1976-77 resulted in zero recharge while wet years such as 1982-83 can yield 125,000 af/y recharged in KCWD. The results of the program are monitored by semiannual measurements of the groundwater level in 230 wells through a cooperative effort. The average of the measurements are taken in these wells each autumn. These measurements depict an erratic decline in groundwater levels. Since KCWD formation in 1954, the average depth to groundwater has gone from 37 feet to 74 feet measured in the autumn of 1997. The average yearly decline in groundwater levels is .86 feet per year since 1954. This equates to an annual average overdraft of 12,300 af/y. To counteract this overdraft, KCWD has practiced a conjunctive use of both surface and groundwater, plus the planned artificial recharge of the groundwater by importing available surplus water and flood release water from reservoirs on the San Joaquin, Kings, and Kaweah Rivers and placing it in recharge basins. KCWD practices appear to be producing positive results because the rate of decline in groundwater levels is less after 1954 than in years preceding formation of KCWD. KCWD efforts are enhanced by the cooperation of Last Chance, Peoples, Settlers, and Lakeside Ditch Companies that provide the conveyance system to these basins and help regulate the rate of recharge. Furthermore, they help distribute surface water purchased by KCWD to local farmers who would otherwise pump groundwater. Approximately 135,000 acres (nearly 95 percent) in KCWD is irrigated agriculture. Surface water supplies for irrigation come from diversions of the Kings and Kaweah Rivers, and from exchanges and purchases of CVP and SWP water. The supply of surface water is inconsistent, and ranges from a low of 30,000 af in 1997 to a high of 327,000 af in 1983. The estimated average surface supply is 150,000 af. Due to inadequate surface water supplies, even in wet years, to meet the total demands for water within KCWD, groundwater is pumped through private wells owned by landowners to meet their individual needs. In addition, all the water requirements to meet M&I users is pumped. Approximately 282,500 af of groundwater is pumped annually resulting in overdraft. This condition is expected to worsen as the urban population grows.

KCWD 1996 Crop Map, showing land use information from DWR 1996 Land Use Survey, indicated that approximately one-half of KCWD's area is field crops, with high proportions of the remaining land used to grow grain and hay, deciduous fruits and nuts. There is a smaller amount of land planted in vineyards as well as citrus, plus truck, nursery and berry crops. The City of Hanford (population approximately 40,000), the County seat of Kings County, is situated in the geographical center of the KCWD. The 1996 map indicated that approximately 25 percent of KCWD's area is semi-agricultural or non-agricultural. According to KCWD, there is a slow but steady development trend change in land uses from agriculture to urban as the City expands and small county acreages are converted to home sites. The lands that are served by KCWD have been in cultivation for several decades or longer, with some of the People's Ditch Company ditches dating back to the 1870-1890 period. KCWD has purchased varying amounts of CVP water since 1956. Water purchases have ranged from a low of 1,639 af in 1997-98 to a high of 28,969 af in 1998-99.

### **Lakeside Irrigation Water District**

Lakeside Irrigation Water District (LIWD) is located east of the city of Hanford and the northern portion is crossed by State Hwy 198. LWD is situated within Kings County Water District, Kaweah Delta Water Conservation District and a portion within Kings River Conservation District. LIWD is not represented by the above listed umbrella agencies. LIWD is a member of the Mid-Valley Water Authority; however, Mid Valley Water Authority is not included as a participant in this Proposed Action and environmental analysis LIWD has a total of 31,917 acres. In LIWD's 1998 Annual Report, approximately 27,155 acres were irrigated agricultural land, 1,817 acres were non-agricultural land and 2,945 acres were idle/fallow land that could be irrigated. LIWD has maintained a crop survey since its formation in 1962. In 2000 the four largest crops were cotton (9,879 ac), corn (7,697 ac), silage grains (6,521 ac), and alfalfa (5,133 ac). Portions of these crops were single or double cropped for a total of 33,643 acres planted. The balance of agricultural land was planted to various tree crops, grasses, vegetables and sugar beets.

There have been no sightings of Federally listed threatened or endangered species within the bounds of LIWD.

### **Liberty Water District**

Liberty Water District (LWD) is located in Fresno County south of the city of Caruthers and northerly of the cities of Riverdale and Laton and is bisected by Hwy 41. LWD comprises 21,189 acres and all are irrigated agriculture. LWD has historically grown row crops, alfalfa, grains which have been planted to tree crops, and vines with little or no change in the annual crop water demand. LWD would utilize CVP water exclusively for agricultural use or recharge of groundwater and would not transfer the CVP water. LWD has no M&I use within LWD.

### **North Kern Water Storage District**

The North Kern Water Storage District is situated in the San Joaquin Valley portion of Kern County and encompasses about 70,000 acres divided into two project areas. The 1950 North Kern Water Storage District project of about 60,000 acres (North Kern hereinafter) and the 1979 Rosedale Ranch Improvement District project of about 10,000 acres. Both are fully developed to irrigated agriculture, with almonds and grapes accounting for about 50% of the cropped area and

stone fruit and other permanent and annual crops comprising the remaining amount. North Kern is comprised of approximately 64,813 irrigated acres and about 74% is planted to permanent crops. Water supplies include Kern River, Poso Creek, oilfield waste water, and other smaller creeks.

#### 1950 North Kern Project

The historical surface water supplies of North Kern have ranged from 6,000 acre-feet in a dry year to nearly 394,000 acre-feet in a wet year. Owing to the highly variable Kern River supply, North Kern has been forced to regulate available surface water supplies from times of surplus (wet years) to times of need (dry years). This regulation has been accomplished, to a large extent, through use of the underlying groundwater reservoir. During wet years on the Kern River, significant deliveries of surface water are made to irrigation and spreading (for groundwater recharge). For the purpose of groundwater recharge, North Kern makes use of about 1,500 acres of recharge basins (water spreading areas); the dry channel of Poso Creek and several other controlled-flow facilities. In wet years, more than 200,000 acre-feet of water have been directed into recharge basins for replenishment of the groundwater aquifer. During dry years, deliveries of surface water to irrigation are greatly reduced and groundwater pumping is significant. Extraction of groundwater by means of North Kern wells has ranged from zero to more than 80,000 acre-feet in one year. North Kern has successfully operated its conjunctive use project for 50 years. The underlying groundwater is part of the larger groundwater basin which underlies the southern San Joaquin Valley. While North Kern is in balance respecting water supplies and uses within its boundaries, groundwater levels are tied to the larger basin, which is in a condition of overdraft.

#### 1979 Rosedale Ranch Improve District Project

After the above 1950 project was implemented lands were annexed to North Kern with the specific requirement that the newly annexed lands would not share in the water supplies of the original project. The lands thus developed a distinct and separate project with the purchase of water supplies during wet years from Kern River rights of the City of Bakersfield. The Rosedale Ranch project has approximately 14 miles of unlined canals for the direct delivery of water or irrigation. The focus of the project was groundwater recharge through a combination of in-lieu-pumping deliveries and canal losses which has totaled up to 31,000 af. North Kern does not supply M&I water service.

The FKC bisects North Kern with less than 50% uphill of the FKC. There is a turnout on the North side of Poso Creek on the FKC. North Kern has a weir across Poso Creek on the Calloway Canal approximately 1-1/2 miles below the FKC. NKWSD, in a program with Kern-Tulare and Rag Gulch Water districts recently constructed a turnout off 1 mile north of 7th Standard Road. In addition, North Kern has a pump station on the Calloway Canal at Kimberlina Road that is used to deliver water supplies to Shafter-Wasco Irrigation District (SWID) via SWID's North Pipeline. The pump station can also allow water to flow into the Calloway Canal at this location. NKWSD also has a gravity outlet on the Calloway Canal near the intersection of Cherry and Fresno Avenues that is used to deliver water supplies from the Shafter-Wasco Irrigation District South Pipeline into the Calloway Canal. Finally, water supplies delivered at the end of the FKC can be exchanged for Kern River supplies being delivered at lower elevations. The Kern River

supplies intended for lower elevations are diverted into the District's higher elevation Beardsley Canal to be delivered to lands uphill of the FKC.

### **Rosedale-Rio Bravo Water Storage District**

Rosedale-Rio Bravo Water Storage District (R-RBWS) is located west of Bakersfield in Kern County. R-RBWS has a gross area of approximately 43,000 acres with a net estimate of 33,400 irrigated agricultural acres. Approximately 3,900 acres are fallow lands, 2,500 acres undeveloped lands and 1,100 acres of canals and recharge basins. R-RBWS is primarily planted to alfalfa hay, almonds, grain, cotton and corn. All water coming into R-RBWS has been used for groundwater recharge and overdraft correction. R-RBWS does not serve M&I water.

Water was historically supplied from landowner wells pumping from the groundwater basin, with a small amount (an average about 15,000 af/y) of irrigation diversions to lands adjacent to the R-RBWS's groundwater recharge project. Prior to operation of its groundwater recharge project, pumping extractions exceeded the safe yield of the local groundwater supply, and a substantial overdraft in the range of 40,000 to 50,000 af/y occurred annually. As a result of this overdraft, groundwater levels were declining at a rate of 8 to 10 feet per year. In 1959, the R-RBWS was formed to develop a groundwater recharge project to offset the overdraft. Construction of the recharge project was completed in 1962. The physical features of the project include facilities to divert waters from the Kern River and the joint use Cross Valley Canal into the Goose Lake Slough Channel, the channel itself and recharge basins. R-RBWS has completed construction of additional recharge basins and now has a wetted area of approximately 840 acres available for groundwater recharge. R-RBWS is also a recharge participant in the Pioneer Project, and as such, has first priority to 25% of the total recharge capacity. This provides an additional 50 cfs of recharge capacity. R-RBWS acquires water for recharge purposes from the Kern River through a water service agreement with the city of Bakersfield, from the FKC of the CVP, as available, and from the SWP through a water supply contract with the KCWA. Water supplies from these three sources have averaged about 62,000 af/y for the years 1962 through 1999 or about 79% of the cumulative consumptive use during those years.

The SWP contract was originally to provide an average (firm and surplus) of about 29,900 af/y. However, R-RBWS is now expected to receive only about 76% of its firm supply or about 22,700 af/y. R-RBWS has also been unable to renew its short-term contract with Reclamation and is now only able to obtain CVP water through transfers or surplus (flood water) supplies.

### **Semitropic Water Storage District**

Semitropic Water Storage District (SWSD) is located in north-central Kern County in the San Joaquin Valley, about 20 miles northwest of the City of Bakersfield. Semitropic was organized in 1958 to supply supplemental water within its boundaries. The total land area within Semitropic is approximately 221,000 acres (345 square miles), with about 143,000 acres (223 square miles) irrigated area. Geographically, SWSD is located at the South End of the San Joaquin Valley, which is generally hotter and drier than other parts of the Valley.

During the 1960's, Semitropic developed plans for main conveyance and distribution system facilities to extend from the Governor Edmund G. Brown California Aqueduct (California

Aqueduct) to farm delivery locations. Prior to construction of the facilities, irrigated crops within Semitropic were totally dependent on groundwater pumping.

Semitropic initially contracted with the Kern County Water Agency (KCWA), for an annual firm supply of 158,000 acre-feet of State Water Project (SWP) water and 25,100 acre-feet per year of surplus water. Semitropic gave up 3,000 acre-feet of supply to buy into Kern Water Bank (KWB) and now has 155,000 acre-feet annual firm supply of SWP water. This is used to irrigate approximately 42,300 acres in its Contract Water Service Area (CWSA). Other water is available from the KCWA on an interruptible basis to deliver to other service areas totaling about 58,000 acres (consisting of a Conjunctive Surface Water/Groundwater Surface Area (CSWGSA) of about 28,500 acres and an In-Lieu Service Area (ILSA) of about 29,500 acres). Farmers in all the service areas maintain wells to supplement Semitropic Supplies and protect against shortages. Nearly 42,700 acres rely exclusively on groundwater. Landowners within SWSD apply approximately 480,000 acre-feet of water of which, in a very good year 350,000 acre-feet can be imported surface water with the remaining 130,000 acre-feet applied in the groundwater service area. Approximately 72% of the land area in SWSD is included in the Buttonwillow and Pond Poso Improvement Districts leaving 28% in the "unorganized area". The "unorganized area" is a large, contiguous area in the northwest quarter of SWSD. This area is mostly not irrigated and does not benefit from the Proposed Action nor is it envisioned to be developed to irrigated agriculture.

SWSD provides water banking and owns a portion of the Kern Water Bank. It should be noted that water banking for later (beyond one-year) is not included in this analysis and review process. SWSD also provides banking for conjunctive use for in-lieu storage to alleviate groundwater pumping. The Proposed Action could result in providing CVP water to SWSD for the purpose of groundwater recharge or conjunctive use.

### **Tulare Lake Basin Water Storage District**

Tulare Lake Basin Water Storage District (TLBWSD) has a service area of 185,800 acres and its boundaries include nearly the entire Tulare Lake Bed. TLBWSD is located southwest of the city of Corcoran in Kings County. TLBWSD was formed in 1926 at which time all the lands in TLBWSD were fully developed. All deliveries from TLBWSD are for agricultural purposes. TLBWSD manages Kings River South Fork water deliveries at Empire No. 2 Weir near Stratford (immediately below State Route 41) in Kings County. Empire No. 2 Weir diverts Kings River water into the Tulare Lake, Kings River-South Fork and Blakeley canals which serve the Tulare Lake Bed. TLBWSD is a SWP contractor and is connected to the California Aqueduct by Lateral A and B. Despite its state contract, the Tulare Lake Bed units rely most heavily on Kings River water for irrigation purposes.

CVP water is conveyed to TLBWSD via the California Aqueduct or released into the Kings River, Kaweah River or Tule River from the FKC. While TLBWSD has no formal water banking facilities, it does practice conjunctive use.

The area served by TLBWSD remain vulnerable to occasional flooding and drought-caused water supply shortages. The result, economically and physically, is that the Tulare Lake Bed is farmed in large tracts upon which annual field crops are produced. Small farmers cannot endure

the financial burdens of Tulare Lake Bed agricultural operations. Main crops are cotton, seed alfalfa and grain.

***Kings River Conservation District***

The Kings River Conservation District (KCRD) is a water resources and energy management agency located in the central San Joaquin Valley. KCRD is a public agency created in 1951 through special legislation by the State of California. Its boundaries include the entire service area of the Kings River – an area of approximately 1,100,000 acres, plus an additional area of approximately 140,000 acres outside of the Kings River service area. KCRD’s mission is to provide flood protection, achieve a balanced and high quality water supply, and develop power resources within its boundaries. KCRD works with and coordinates the common interests of the following thirty-five (35) entities:

Alta Irrigation District	Tulare Lake Basin Water Storage District
Clark's Fork Reclamation District No. 2069	Tulare Lake Reclamation District No. 761
Consolidated Irrigation District	Burrel Ditch Company
Corcoran Irrigation District	Corcoran Irrigation Company
Empire West Side Irrigation District	Crescent Canal Company
Fresno Irrigation District	John Heinlen Mutual Water Company
James Irrigation District	Last Chance Water Ditch Company
Kings County Water District	Lemoore Canal and Irrigation Company
Kings River Water District	Liberty Canal Company
Laguna Irrigation District	Liberty Mill Race Company
Lakeside Irrigation Water District	Lovelace Water Corporation
Liberty Water District	Peoples Ditch Company
Mid-Valley Water District	Reed Ditch Company
Raisin City Water District	Southeast Lake Water Company
Riverdale Irrigation District	Stinson Canal and Irrigation Company
Salyer Water District	Tulare Lake Canal Company
Stratford Irrigation District	Upper San Jose Water Company
Tranquility Irrigation District	

**Alta Irrigation District**

Alta Irrigation District is located east and south of the Kings River and was California's first public irrigation district formed (in 1888) to actually deliver water to its users. The District's Alta Canal transports water into a system which serves the area from Reedley to an area west of Orange Cove in eastern Fresno County, and the Dinuba, Orosi, and Traver areas of northern Tulare County. The District's total area is 130,000 acres of which irrigated ag is 90,000 and M&I is 40,000 acres. Main crops are peaches, nectarines, plums, citrus, and grapes.

#### Clark's Fork Reclamation District No. 2069

Clark's Fork Reclamation District No. 2069 delivers a limited amount of water to the Kings County "island" formed by the Kings River's Clark's Fork and South Fork channels northwest of Lemoore. The District has no District owned distribution system. Diversions are all by pumping through 30 individual pumping facilities along the Clark's Fork and South Fork channels. The service area is 1,920 acres. Irrigated acres are 1,800 and 120 acres are fallow. Main crops are cotton, alfalfa and wheat.

#### Consolidated Irrigation District

Consolidated Irrigation District (CID) has a service area of 155,000 acres serving a large portion of southeastern Fresno County and smaller areas in northeastern Kings County. CID extends from northeast of Sanger to south of Kingsburg and west of Caruthers. Communities served by CID include Sanger, Del Rey, Parlier, Fowler, Selma, Kingsburg and Caruthers. CID was a pioneer in developing groundwater recharge basins, storing water in the underground reservoirs in wet years for use (by pumping) in dry years and by those lacking access to surface water supplies in the San Joaquin Valley. CID also administers the Lone Tree Channel, a separate water delivery system. Lone Tree rights are held by approximately 80,000 acres within CID's boundaries.

#### Corcoran Irrigation District

Corcoran Irrigation District is described earlier in this document.

#### Empire West Side Irrigation District

Empire West Side Irrigation District serves a narrow territory which stretches more than seven miles along the South Fork's right (west) bank from above Empire No. 1 Weir, an area running northwest to southwest of Stratford in Kings County. Empire West Side Irrigation District also is a SWP contractor with deliveries made through TLBWSL Lateral A, which leaves the California Aqueduct at Kettleman City. Empire West Side Irrigation District serves agricultural water to its service area comprising 6,400 acres.

#### Fresno Irrigation District

Fresno Irrigation District (FID) is a member of KRCD and is also a CVP Long-Term Contract. FID takes delivery of the City of Fresno's Class 1 water amounting to 60,000 af/y and 75,000 af/y of Class 2 water from the Friant Division. The FID supply under the complex Kings River water diversion schedules is the largest in KRCD. Surface water transported by FID to groundwater recharge basins sustains the groundwater which is presently the only source of municipal and industrial water for the metropolitan Fresno-Clovis area. Surface water used for agricultural irrigation is also a major groundwater recharge contributor. FID stretches from the base of the Sierra foothills to west and south of Kerman. FID's internal water distribution system is extensive and complex. FID provides water (through the Fresno supply) to the Freewater County Water District north of Sanger.

FID's territory encompasses much of the northern valley floor portion of Fresno County and embraces the cities of Fresno and Clovis. Other communities within FID's service area include Kerman and Biola. FID's service area is the largest of any member unit. The service area is 245,246 acres. Irrigated agriculture is 152,694 and M&I is 92,552 acres.

### James Irrigation District

James Irrigation District (JID) formerly served its agricultural users with Kings River water diverted through the James Main and Beta Main canals. JID's mission is to deliver agricultural water and has a service area of 25,800 irrigated acres. Since 1963, its primary surface water supply (under water exchange agreements with both JID and Tranquillity Irrigation Districts (TRID) and the lower Kings River units) has been CVP water pumped from the Mendota Pool. JID diverts Kings River water only when flood release flows are available. Water enters JID by diversions of Kings River water at the James Weir; Diversions of CVP water pumped from Mendota Pool into the James Bypass; diversions of San Joaquin River water from Mendota Pool through the James Bypass; delivery from a well field through lined canals and pipelines along Lassen Avenue and McMullin Grade Road; and spill from Fresno Irrigation District into a lined canal along McMullin Grade Road (not a supply). No water leaves JID.

JID and TRID are the two most northwesterly units and have an exchange agreement resulting in water being imported into the Kings River service area on a regular basis. JID and TRID are also CVP Contractors. The two Districts leased their average annual Kings River supply to other lower Kings River units at a price equal to that paid by JID and TRID to purchase a like amount of CVP water delivered at Mendota Pool through the Delta-Mendota Canal under their CVP Long-Term contracts. Up to 26,600 acre feet of JID and TRID supply in any one year is credited by the lower Kings River units to help facilitate minimum Pine Flat releases for fish and wildlife, channel conveyance losses and other administrative purposes. JID and TRID benefit by avoiding enormous Kings River channel losses in exchange for 100% water deliveries from Mendota Pool while assisting other Kings River units in resolving their own channel loss problems.

### Kings County Water District

Kings County Water District is described earlier in this Section as a separate individual entity.

### Kings River Water District

Kings River Water District (KRWD) serves much of the Centerville Bottoms area northeast, east and southeast of Sanger. The Centerville Bottoms is a rich and beautiful delta containing many wooded areas and complex, secluded sloughs which, supplied by the Kings River, ultimately flow back into the main stream. KRWD's senior water rights and small delivery system capacity combine to enable KRWD to deliver water much of the year. KRWD's service area is 25,800 acres of which 10,000 acres are irrigated agriculture. KRWD does not provide M&I water. Water enters by diversions from the Kings River. No water leaves KRWD.

### Laguna Irrigation District

Laguna Irrigation District (LGID) serves an area of southern Fresno County and northern Kings County west of Laton and south, southeast and southwest of Riverdale. The total service area is 35,000 acres with a substantial portion that includes the historic Rancho Laguna de Tache grant. This grant was a 48,800 acre Mexican land grant which included a 26 mile stretch along the original Kings River channel's right bank (below the modern site of Kingsburg. LGID southerly boundary is generally along the Kings River. The grant was complex but played a pivotal role in the eventual settlement of Kings River water rights and supplies through its 1892 purchase by the Fresno Canal and Irrigation Company, and gained control of the grant's riparian water claims. In 1897, the manager of the Fresno canal system and the Laguna ranch owner negotiated the first

partial Kings River water supply schedules. This ultimately led to later agreements that resolved all Kings River water rights and supply issues. LGID has a total area of 35,000 acres of which 20,700 are agricultural. LGID does not provide M&I water.

Lakeside Irrigation Water District

Lakeside Irrigation Water District is discussed earlier in this section.

Liberty Water District

Liberty Water District is discussed earlier in this section.

Mid Valley Water District

Mid Valley Water District is comprised of 13,406 agricultural acres. Water is delivered by pumping from the James Bypass. Mid Valley Water District does not provide M&I water.

Raisin City Water District

Raisin City Water District (RCWD) has a total of 53,500 acres, of which, 43,500 are agricultural, 5,000 are M&I and 5,000 are fallow. RCWD does not provide M&I water.

Riverdale Irrigation District

Riverdale Irrigation District (RID) serves rural portions of the Riverdale community between Murphy Slough and the King River's North Fork. RID's Kings River supply is combined with the Reed Ditch Company and Liberty Mill Race Company under the Murphy Slough Association. RID's total area is 15,000 acres, of which, 14,000 acres are ag, 700 are M&I and 300 are fallow. Water is diverted from the Kings River near the town of Laton. No water is returned to the river.

Salyer Water District

Salyer Water District still exists but is no longer functioning and will not be a participant or receiving CVP water.

Stratford Irrigation District

Stratford Irrigation District service area is 9,750 agricultural acres and serves the left (east) bank of the South Fork, below Empire No. 1 Pool. Stratford Irrigation District serves the Stratford area of Kings County and does not provide M&I water. Water is diverted from the Kings River at Lemoore Weir into the Lemoore Canal, or from the Kings River at Empire Weir No. 1 or Empire Weir No. 2.

Tranquillity Irrigation District

Tranquillity Irrigation District (TRID) is a CVP Contractor and has already undergone extensive environmental review and is not the focus of this EA. TRID has a service area of 10,700 agricultural acres and is a CVP Long-Term contractor. TRID is the northwesterly unit in KRCD. TRID's surface water supply (under the Tranquillity exchange agreement) is pumped from the Mendota Pool. TRID's former Kings River diversion facilities, the Lone Willow Channel and Beta Main Canal, were last used in 1958 and are abandoned.

Tulare Lake Basin Water Storage District

Tulare Lake Basin Water Storage District is described elsewhere in this section

Tulare Lake Reclamation No. 761

Tulare Lake Reclamation District No. 761 receives most of its water supplies through the Blakeley Canal, originating at Empire Weir No. 2, and Lateral A from the SWP. Tulare Lake Reclamation No. 761 delivers water to lands on the western and southwestern sides of the Tulare Lake Bed in Kings County. Its service area is 37,000 acres, of which, 16,000 acres are agricultural and none are M&I. The remaining acres are fallow/idle and portions serve as wetlands. Main crops are wheat and alfalfa.

Burrel Ditch Company

Burrel Ditch Company has a service area of 4,500 agricultural acres and is a mutual water company. The company delivers water from Murphy Slough into the company's small service area in the Burrel area, east of Fresno Slough. Main crops are wine grapes, almonds, alfalfa and silage corn.

Corcoran Irrigation Company

Corcoran Irrigation Company has no designated service area and is a mutual water company serving the Corcoran area of eastern Kings County with water transported 25 miles through the Lakelands Canal system from People's Weir, south of Kingsburg. The Peoples Weir is the largest of all such Kings River structures and spans the main channel a mile south of the Fresno County of Kingsburg just inside the northeastern corner of Kings County. It creates a large pool from which water may be diverted into the Lakelands Canal, which flows from the left bank 25 miles to the Corcoran area, or into the People's Ditch. Those privately owned canals deliver water to users in a substantial portion of eastern Kings County, all the way south to the Tulare Lake Bed.

Crescent Canal Company

Crescent Canal Company has a service area of 13,100 agricultural acres and is a mutual water company serving an area west of the Kings River North Fork and Fresno Slough, several miles of west of Riverdale. Deliveries are through the company's Crescent Canal. The Crescent Weir is located a few miles southwest of Riverdale and four miles below State Route 41 where North Fork flood release quantities are typically measure and confirmed. Beginning here is the Crescent Canal Company's ditch. Main crops are cotton, seed alfalfa and safflower.

John Heinlen Mutual Water Company

John Heinlen Mutual Water Company has a service area of 13,100 agricultural acres and serves stockholders in a Kings County area north and northwest of Lemoore. Main crops are cotton and alfalfa.

Last Chance Water Ditch Company

Last Chance Water Ditch Company is a mutual water company which serves stockholders within a large portion of Kings County, southwest of Laton and north and west of Hanford, as well as, portions of the Tulare Lake Bed. The company has a service area of 39,000 agricultural acres. Main crops are stone fruit and walnuts.

Lemoore Canal and Irrigation Company

Lemoore Canal and Irrigation Company is a mutual water company serving stockholders in the Lemoore area of Kings County. The company's large service area has one of the most substantial

lower river water supplies. The company's service area is 52,300 agricultural acres. Main crops are cotton, wheat and safflower.

Liberty Canal Company

Liberty Canal Company is a mutual water company and delivers water through the Liberty Canal which flows northwesterly from Laton to the company's service area of 5,300 irrigated acres north of Riverdale. Main crops are orchards, vines and row crops.

Liberty Mill Race Company

Liberty Mill Race Company is a mutual water company receiving water through Murphy Slough and serves an area, approximately 8,100 irrigated acres, north and northwest of Riverdale and near Burrel.

Lovelace Water Corporation

Lovelace Water Corporation, a private water company, serves the northern portion of the Tulare Lake Bed with deliveries made through the Kings River South Fork Canal and the Tulare Lake Canal. Lovelace Water Corporation has no designated service area.

People's Ditch Company

People's Ditch Company is a mutual water company providing water service over an extensive portion of northeastern Kings County (including the Hanford area), as well as, making deliveries to stockholders in the Tulare Lake Bed. The company operates People's Weir which was discussed in this section under Corcoran Irrigation Company. In wet years, surplus water deliveries through the People's Ditch is ponded in the Kings County Water District's extensive system of groundwater recharge basins and channels. The People's Ditch Company has no designated service area.

Reed Ditch Company

Reed Ditch Company is a mutual water company serving a small area northwest of Riverdale with water delivered through Murphy Slough. The company's service area is 3,500 irrigated agricultural acres. Main crops are trees, row crops and vines.

Southeast Lake Water Company

Southeast Lake Water Company is a mutual water company with no designated service area. The company delivers water to stockholders in portions of the Tulare Lake Bed.

Stinson Canal and Irrigation Company

Stinson Canal and Irrigation Company is a mutual water company and has a service area of 15,500 irrigated agricultural acres serving an area west of the left bank of the North Fork and Fresno Slough, west and northwest of Burrel. Deliveries are through the company's Stinson Canal. Main crops are row crops.

Tulare Lake Canal Company

Tulare Lake Canal Company is a mutual water company and has no designated service area. The company provides water to stockholders in portions of the Tulare Lake Bed.

Upper San Jose Water Company

Upper San Jose Water Company serves a narrow area about seven miles along the western sides of the South Fork, Clark's Fork and the Crescent Bypass, just east of Lemoore Naval Air Station in Kings County. The company has no designated service area.

Ditch companies are entities that do not have specific geographic boundaries. However, they own canals and ditches that provide the mechanism to deliver water to the stock holders.

Besides groundwater potential water supplies are Kings River and streams tributary thereto, such as Mill Creek, Sand Creek, Wahtoke Creek and other minor streams flowing into KRCD, Kaweah, St. Johns and Tule Rivers, SWP, and CVP (Friant Division or Cross Valley Canal Divisions supplies).

# Appendix F – Conveyance Facilities and Waterways

## ***Jones Pumping Plant and Banks Pumping Plant***

Located in the Sacramento-San Joaquin Delta, Banks lifts water 244 feet from the Clifton Court Forebay into the beginning of the Aqueduct. DWR has a priority system for pumping SWP and CVP water supplies at Banks. CVP water supplies have a lower priority compared to SWP uses. Prior to pumping CVP supplies at Banks (Joint Point of Diversion {JPOD}) there are environmental and water quality plans that must be submitted and approved and criteria that must be met. Under certain conditions, DWR does not have an opportunity to pump and convey the annual allocation of water supplies to the CV contractors or pumping and conveyance may occur at a time that is outside of the growing season.

Jones consists of an inlet channel, pumping plant, and discharge pipes. Water in the Delta is lifted 197 feet into the DMC. Each of the six pumps at Tracy is powered by a 22,500 horsepower motor and is capable of pumping 767 cfs. Power to run the huge pumps is supplied by CVP powerplants. The water is pumped through three 15-foot-diameter discharge pipes and carried about 1 mile up to the DMC. The intake canal includes the Jones Fish Screen, which was built to intercept downstream migrant fish so they may be returned to the main channel to resume their journey to the ocean. Although CV contractor supplies are predominantly pumped at Banks, infrequently, if pumping capacity exists after all other CVP needs have been met (typically in the spring), CV contractor water supplies have been pumped at Jones and moved over the SWP at O'Neill Forebay for conveyance to the CVC.

## ***Delta-Mendota Canal***

The DMC carries water southeasterly from the Jones along the west side of the SJV for irrigation supply, for use in the San Luis Unit, and to replace San Joaquin River water stored at Friant Dam and used in the Friant-Kern and Madera systems. The canal is about 117 miles long and terminates at the Mendota Pool, about 30 miles west of Fresno. The initial diversion capacity is 4,600 cfs, which is gradually decreased to 3,211 cfs at the terminus. It also connects with O'Neill Forebay near San Luis Reservoir where water can be pumped from the DMC into either San Luis Joint Use Facilities a part of which is a shared canal named the San Luis Canal for the CVP and the Aqueduct for the SWP.

## ***O'Neill Forebay***

These joint Federal/State facilities are located on San Luis Creek, 2.5 miles downstream from San Luis Dam. O'Neill Dam, completed in 1967, is a zoned earthfill structure with a height of 87 feet and a crest length of 14,300 feet. The forebay, with a capacity of 56,400 AF, is used as a hydraulic junction point for Federal and State waters. The top 20,000 AF acts to re-regulate storage necessary to permit off-peak pumping and on-peak generation by the main San Luis Pumping-Generating Plant. The O'Neill Forebay Inlet Channel extends 2,200 feet from the DMC to deliver water to the O'Neill Forebay. Six pumping units of the O'Neill Pumping-Generating Plant lift water 45 to 53 feet into the forebay.

### ***Friant-Kern Canal***

The FKC carries water over 151.8 miles in a southerly direction from Friant Dam to its terminus at the Kern River, four miles west of Bakersfield. The FKC has an initial capacity of 5,000 cfs that gradually decreases to 2,000 cfs at its terminus in the Kern River (Reclamation, 2009). The water conveyed in the FKC is from the San Joaquin River and is considered to be of good quality because it originates from snow melt from the Sierra Nevada. The water is used for municipal and industrial, and agricultural purposes in Fresno, Tulare, and Kern Counties. The FKC is a part of the CVP, which annually delivers about seven million AF of water for agricultural, urban, and wildlife use.

### ***California Aqueduct***

The State of California constructed the Aqueduct as part of the SWP. Waters from the Aqueduct flow out of the Delta near the City of Tracy to San Bernadino and Riverside into Lake Perris. SWP contractors take delivery from the CVC and/or direct diversion from the Aqueduct. The SWP typically delivers approximately 1.36 million AF to the SJV per year. Contracts executed in the early 1960s established the maximum annual water amount (supply) that each SWP long-term contractor may request from the SWP.

Recovered groundwater that is discharged into the Aqueduct, can be delivered to water districts or exchanged with the DWR. Exchanges with the DWR can be simultaneous, or delayed exchanges. In a simultaneous exchange water delivered from the Aqueduct to an upstream district at the same time the recovered groundwater is transported to the Aqueduct. With a delayed exchange, water might be delivered by the DWR to the receiving district from storage before or after the recovered groundwater is received.

### ***Cross Valley Canal***

The CVC extends from the Aqueduct near Tupman to Bakersfield. It consists of four reaches which have capacities ranging from 890 cfs through the first two pumping plants to 342 cfs in the unlined extension near Bakersfield. The canal is a joint-use facility operated by the Kern County Water Agency for the CVC participants. Water can be conveyed through the CVC to the Kern Water Bank, the City of Bakersfield, the Berrenda Mesa Property, the Kern River channel, Pioneer Banking project and the various member units recharge sites.

The CVC is also used to convey banked groundwater after it is recovered. Once in the CVC, recovered water can be delivered to CVC participants in exchange for water in the Aqueduct. During periods when water is not available for exchange, the CVC can be operated in reverse flow. When operated in reverse flow, water flows from the CVC directly into the Aqueduct. In 1991, water levels in the Aqueduct were low enough for the flow to be by gravity. When water levels in the Aqueduct are too high for gravity flow, the water must be pumped into the Aqueduct. Due to this bi-lateral flow flexibility, the operations on the CVC require coordination among the users. The CVC provides flexibility in the conveyance of water supplies in the central and southern SJV. CVP or State Water Project (SWP) water supplies originating from the Delta are the predominant supplies conveyed through the CVC, although groundwater or previously banked water is also conveyed in this canal.

### ***Kern River/Alejandro/Outlet Canals***

Water from the FKC, the CVC, or from the Kern River can be conveyed in the Kern River channel or in the Kern River Canal to the Pioneer Banking project or other recharge areas. Conveyance of water in the Kern River Canal requires an agreement with the City of Bakersfield. Conveyance of water in the Alejandro Canal requires an agreement with the Buena Vista Water Storage District. It should be noted that depending on groundwater pumping operations, water in the Buena Vista Aquatic Lake may contain high concentrations of arsenic. These high concentrations are caused when groundwater from nearby wells is pumped into the Buena Vista Aquatic lakes for agricultural use and to make up evaporation losses.

The Kern River is about 165 miles long and is the southernmost river in the San Joaquin Valley. The river originates from the Sierra Nevada mountains on the eastern side of Tulare County and terminates on the west side of Kern County where it is mainly diverted for local water supplies. When the Kern River enters Kern County, it deposits into Lake Isabella created as a result of Isabella Dam. Below the dam, the river is highly diverted through a series of canals to irrigate farms in the southern San Joaquin Valley and provide municipal water supplies to the City of Bakersfield and surrounding areas. The Kern River is one of the few rivers in the Central Valley which does not contribute water to the CVP; however, the FKC joins the river approximately four miles west of downtown Bakersfield. Kern River water quality is generally similar to that in the FKC since its origin is also from snow melt in the Sierra Nevada. The Kern River Canal can also be used to convey water from the Kern River to the California Aqueduct directly via the Alejandro Canal, the Buena Vista Aquatic Lakes and Outlet Canal and a pumping plant, or indirectly via an exchange.

### ***Kern Water Bank Canal***

The Kern Water Bank Canal is a bi-directional canal constructed by the Kern Water Bank Authority. The canal has a single pumping plant for delivering water for recharge. The forward flow capacity is 950 cfs. Reverse flow capacity is approximately 650 cfs. The canal is used to convey SWP water and other waters from the Aqueduct to the local banking projects for groundwater recharge. The canal is also used to convey pumped groundwater during a surface water short year, back to the Aqueduct, either directly or by exchange, to water districts for a supplemental water supply.

### ***Kings River***

The Corps is the operator of Pine Flat Dam and releases water for flood control. During the irrigation season, (normally June through August) water is released from behind Pine Flat Dam and the Kings River is controlled by the Kings River Water Association. In wet years the Kings River may flow to the Tulare Lake Basin. Only in very wet seasons does the Kings River flow north into Fresno Slough and into the San Joaquin River. The average annual runoff for the Kings River is approximately 1.7 million AF. The Kings River is managed similarly to a canal system providing water for irrigation and to meet flow requirements for fish and wildlife purposes.

### ***Kaweah and St. Johns Rivers***

The Corps also operates Terminus Dam on the Kaweah River for flood control and water supply. Downstream of Terminus Dam, the St. Johns River and Lower Kaweah River divides from the Kaweah River at McKay Point. The St. Johns River becomes Cross Creek north of Goshen. A

few tributaries such as Dry Creek and Yokohl Creek, flow into the Kaweah and St. Johns Rivers. The Kaweah River ceases to be an identifiable stream south of Highway 245, and the river branches into Mill Creek and other major and minor streams creating a delta. During the irrigation season (June through August) the Kaweah Delta Water Conservation District manages the Kaweah River irrigation flows similarly to a canal facility to meet demands and on behalf of the watermaster for the Kaweah and St. Johns Rivers Association. The average annual runoff of the Kaweah River is 430,000 AF, and does not include various smaller creeks. The St. Johns River was permanently established during the fresher of 1861-62 and branches off the Kaweah River. The Lower Kaweah River, St. Johns River and smaller creeks are used for conveyance of irrigation water to ditch companies and water districts.

### ***Tule River***

The Tule River watershed above Success Dam is a fan shaped area containing 245,000 acres, ranging in elevation of 550 feet at Success Dam to a maximum of 10,000 feet, with less than 10 percent of the watershed above elevation 7,500 feet. The Tule River above Success Reservoir is composed of three channels, the North Fork and the Middle Fork that join just above the community of Springville, and the South Fork that passes through the Tule River Indian Reservation before entering Success Reservoir at State Route 190. The main channel of the Tule River below Success Dam traverses about 50 miles to the pocket of the Tulare Lake Basin where the river joins the terminus of the South Fork of the Kings River. The Tule River bifurcates at Road 192 and a South Fork channel traverses 12 miles along with a third Middle Fork channel of 3 miles, all northerly of the community of Woodville.

Success Dam, a Corps project currently has a storage capacity of 82,300 AF, of which 75,000 AF is reserved for flood control and irrigation water storage. The remaining storage, 7,300 AF, was set aside for a silt and recreation pool. The Tule River runoff at Success Reservoir is extremely variable subject to precipitation in the watershed. Records of the Tule River runoff for the past 101 years are available from water year 1904 through water year 2004. The average annual runoff of the Tule River is 141,630 AF. Of the past 101 years, 1977 was the driest year with a runoff of 15,810 AF, and 1983 was the wettest year with 615,090 AF.

The Tule River Association, made up of all water rights holders at and below Success Reservoir, administers the water and storage rights at and below Success Dam. The Corps controls storage in Success Reservoir through a Flood Control Diagram that limits irrigation storage during the period November 15th to May 1st of the following year. Irrigation water storage operations during the remainder of the year are controlled by the Tule River Association Watermaster.

The Tule River gross service area below Success Dam covers about 320,000 acres, of which 140,000 acres are within Tulare County, and 180,000 acres are within the Tulare Lake Basin of Kings County. Of the gross service area, approximately 240,000 acres are developed in irrigated agriculture with the remainder in urban and non-agriculture uses.

### ***Dos Amigos Pumping Plant***

This joint Federal/State facility, 17 miles south of O'Neill Forebay, is a relift plant in the San Luis Canal. The plant contains six pumping units, each capable of delivering 2,200 cfs at 125 feet of head.

# **Appendix G – ITA and Cultural Resources Concurrence**

**Inthavong, Michael T**

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**From:** Rivera, Patricia L  
**Sent:** Thursday, July 01, 2010 12:14 PM  
**To:** Inthavong, Michael T  
**Subject:** RE: ITA Request Form Review (EA-10-36)

Michael,

I reviewed the proposed action to approve the CV contractors' exchange arrangements with individually proposed exchange partners for the 2010 and 2011 contract years for up to the full CV contractors' CVP contract supply of 128,300 acre-feet per year (AF/y). This EA analyzes the 2010 and 2011 contract years which runs from March 1, 2010 through February 28, 2012. This EA would cover the broadest flexibility for exchange arrangements known at this time.

The proposed action does not have a potential to affect Indian Trust Assets.

Patricia

## Inthavong, Michael T

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**From:** Nickels, Adam M  
**Sent:** Thursday, July 01, 2010 11:05 AM  
**To:** Inthavong, Michael T; Perry, Laureen (Laurie) M  
**Cc:** Bruce, Brandee E; Goodsell, Joanne E; Ramsey, Dawn; Bruce, Brandee E; Overly, Stephen A  
**Subject:** RE: CR Review - EA-10-36 Article 5 Exchanges

Michael I had to correct the project number... it's 10-SCAO-253 no 235. Use the one below.

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**From:** Nickels, Adam M  
**Sent:** Thursday, July 01, 2010 10:56 AM  
**To:** Inthavong, Michael T; Perry, Laureen (Laurie) M  
**Cc:** Bruce, Brandee E; Goodsell, Joanne E; Ramsey, Dawn; Bruce, Brandee E; Overly, Stephen A  
**Subject:** RE: CR Review - EA-10-36 Article 5 Exchanges

Project No: 10-SCAO-253

Michael:

I have reviewed the EA 10-36 for Article 5 exchanges. This EA will be good for two years. After reviewing the EA I have no comments to make regarding impacts to cultural resources.

The proposed action identified in the EA will involve the transfer of water through existing facilities. The transfer will result in no new agricultural production of areas not previously in production, there will be no modification of existing facilities, and there will be no construction of new facilities. The proposed action is administrative in nature will has no potential to cause effects to historic properties pursuant to the regulations at 36 CFR Part 800.3(a)(1).

This email is intended to conclude the Section 106 process. Please retain a copy of this email with the administrative record for this EA. Thank you for the opportunity to comments.

Sincerely,

**Adam M. Nickels** - Archaeologist - M.S.  
Phone: 916.978.5053 - Fax: 916978.5055 - [www.usbr.gov](http://www.usbr.gov)

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RECLAMATION - Mid-Pacific Regional Office MP-153 2800 Cottage Way - Sacramento, California 95825



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**From:** Inthavong, Michael T  
**Sent:** Tuesday, June 29, 2010 10:37 AM  
**To:** Perry, Laureen (Laurie) M  
**Cc:** Bruce, Brandee E; Goodsell, Joanne E; Ramsey, Dawn; Bruce, Brandee E; Overly, Stephen A; Nickels, Adam M  
**Subject:** CR Review - EA-10-36 Article 5 Exchanges

Good Morning Laurie,

Attached is a draft EA for your team to review and determine if the Proposed Action will have any impacts on cultural resources. This is similar to EA-08-99 and EA-07-101, where Reclamation will improve exchanges involving Cross Valley

contractors and other CVP and non-CVP contractors. The Proposed Action will be for the 2010 and 2011 water years, and will use existing facilities.

I would very much like to get this project completed asap, so your team's expedited review would be greatly appreciated. Please let me know if there's anything else I can provide that would help.

CA#: U1N-0863-8603-332-65-0-0-2

Thanks,  
Michael I