RECLAMATION
Managing Water in the West

ENVIRONMENTAL ASSESSMENT
Transfers and Exchanges of CVP Water from the Friant Division to Non-Central Valley Project Contractors and the Execution of Temporary, One-Year Contracts (Section 215)

DRAFT FINAL EA
EA-02-35

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List of Acronyms and definitions

ACOE	US Army Corps of Engineers
af/y	Acre foot per year.
Ag	Agriculture
CO	Contracting Officer
Contractor	Water or Irrigation District contracted with Federal or State Agencies to obtain water.
CVC	Cross Valley Canal
CVP	Central Valley Project
CVP Contractor	Friant Division or Cross Valley Long-Term Contractor
DWR	California State Department of Water Resources
EA	Environmental Assessment
Exchange	Exchange of water among contractors
EWA	Environmental Water Account
FKC	Friant-Kern Canal
IRC	Interim Renewal Contract – Refers to interim contracts in place until the long-term Renewal contracts are signed and executed for CVP supplies.
LTRC	Long-Term Renewal Contract
M&I	Municipal and Industrial
NEPA	National Environmental Policy Act
Non long-term contract	Refers to temporary contracts for short-lived CVP water supplies, if available
NCVPC	Non Central Valley Project Contractor
POU	Place of Use and includes Purpose of Use
Reclamation	US Bureau of Reclamation
RRA	Reclamation Reform Act
Section 215	Refers to Section 215 of the Reclamation Reform Act
Service	US Fish and Wildlife Service
Surplus 215 Water	Refers to surplus water under Section 215 and related contracts for marketing this surplus water
SWP	California State Water Project
Transfer	The sale of water between willing sellers and willing buyers

CHANGES MADE FROM THE PUBLIC DRAFT TO THE FINAL EA

Reclamation did not receive any comments from the public. However, the timing in preparation of the Final EA necessitated updates and changes. The following is a list of updates and changes:

Clarification that each proposed contract for surplus water, request for transfers and exchanges would undergo separate administrative reviews for compliance with the RRA, applicable laws and permits. The pre-conditional approval is contingent upon assumptions that the proposal meets all the applicable laws, regulations, permits and criteria and no additional environmental review is necessary. Each CVP transfer would meet the requirements under the CVPIA and would have no third party impacts including impacts to fish and wildlife. The analysis in this document and the approvals are based on temporary, one-year transfers. Water transfers occurring consecutively between a specific CVP Contractor and NCVCPC for the same amount of water would require additional environmental review and separate approval.

The boundary used to define the project area is the extent of the boundaries where Friant CVP water could be applied.

Clarification that CVP water originating from the Delta is not included. The Consolidated Place of Use is not relevant and is omitted.

Each proposal involving non-CVP water would include evidence of CEQA compliance, as applicable.

Exchanges must be initiated in the same contract year as the approval. The final "leg" of the exchange must be completed within 365 days of the date the initial water moved.

Angiola and Melga Water Districts are within the project area. However, they are not part of this approval and analysis and are omitted in the Final EA.

Updated land use information for Kings County Water District.

The Cumulative Impacts Section was updated.

The list of reviewers was updated.

The results of the consultations under Section 7 of the ESA and reviews under the National Historical Preservation Act will be incorporated into the Final EA.

Editorial changes: Long-term Renewable Contract was changed to Long-term Renewal Contract

BACKGROUND

The US Bureau of Reclamation (Reclamation) constructed the Central Valley Project (CVP) and negotiates contracts with a group of Long-Term CVP Contractors. These contracts are herein referred to as Long-Term Renewal CVP Contracts (LTRC). The LTRCs provide the method for the Federal Government to be reimbursed for the construction, operation, maintenance and administration of the CVP. Therefore, Reclamation must continue contracting with the LTRC contractors, referred to as CVP Contractors from this point in this document. Reclamation is in the process of renegotiating the LTRCs with multiple contractors. Some of the renegotiated LTRCs have been signed and completed. A group of contractors have LTRCs that have expired and are currently in Interim Renewal Contracts (IRC) with Reclamation. A small number of CVP Contractors are still under their old contracts. It is anticipated that they will sign new contracts in 2006.

Article 9 of the LTRC or IRC provide for CVP Contractors to transfer and exchange water between willing sellers and willing buyers with the approval of the Contracting Officer (CO). The conditional pre-approval is contingent upon assumptions that each proposal meets all applicable laws, regulations, permits, criteria and no additional environmental review is necessary. Section 215 of the Reclamation Reform Act (RRA) of 1982 authorizes Reclamation to enter into temporary contracts to quickly disperse surplus water.

SUMMARY

Reclamation proposes to pre-approve, temporary, one year transfers and exchanges between the parties described, and to execute 215 contracts. As individual actions are proposed by CVP Contractors, each will be reviewed by the Contractor Officer to ensure all criteria of CVPIA, Reclamation law, guidelines and policy have been met before final approval is given. The goal of this environmental assessment and associated biological assessment is to expedite the Central Valley Project Improvement Act Title XXXIV (CVPIA) review process for temporary water service contracts and related water actions, as described, by determining if there are any significant environmental impacts.

A group of 17 water user entities that do not have LTRCs with Reclamation have been identified as potential recipients of Central Valley Project (CVP) water from the Friant Division and Cross-Valley CVP Contractors via (1) temporary water service contacts (pursuant to Section 215 of the Reclamation Reform Act), (2) via CVPIA transfer from a CVP Contractor, or (3) an exchange of non-CVP (non project) water for CVP water from a CVP Contractor. These contractors are herein referred to as Non-Central Valley Project Contractors or NCVPCs. These NCVPCs are entities that do not have an allocation of a long-term supply of CVP water pursuant to CVPIA.

These NCVPCs may have at some point in time, entered into a contract with Reclamation for a temporary water service contract, more commonly called “215 contracts” or into a contract for surplus water that is above the allocated amounts of the CVP. It should be noted that Reclamation is authorized at any time to enter into 215 contracts with any

contractor to quickly disperse high flow waters to prevent potential flooding and damage. Article 9 of the IRCs and LTRCs provide for CVP Contractors to transfer and exchange water between willing sellers and willing buyers with the approval of the Contracting Officer. The CVP Contractors have proposed to engage in water transfers and exchanges with the NCVPCs. A list of the potential NCVPCs is provided below:

Non-Central Valley Project Contractors

- Buena Vista Water Storage District
- Cawelo Water District
- Consolidated Irrigation District
- Corcoran Irrigation District
- Deer Creek & Tule River Authority
- Kaweah Delta Water Conservation District
- Kern County Water Agency
- Kern Delta Water District
- Kern Water Bank Authority
- Kings County Water District
- Kings River Conservation District
- Lakeside Irrigation District
- Liberty Water District
- North Kern Water Storage District
- Rosedale-Rio Bravo Water Storage District
- Semitropic Water Storage District
- Tulare Lake Basin Water Storage District
- Lewis Creek Irrigation District

The environmental assessment will be valid until 2025. It should be noted that Friant Division CVP Contractors have been signed and will expire in 2025. Cross-Valley CVP Contractors are operating under IRCs. The proposed action and this environmental assessment will be reviewed and updated as necessary every five-years or when conditions change, whichever occurs sooner. It should be noted the environmental review does not result in a multiple year blanket approval. Each proposal would be reviewed individually prior to final approval for compliance with Reclamation laws, permits, policies, guidelines, as well as consistency with any biological opinions or concurrences as a result of the proposed action and alternatives. Each annual approval would be for water service actions commencing within the same contract year. A contract year typically begins on March 1st and ends February 28th of the following year. Each annual water service action would end no later than 365 days after the date initiated. Exchanges must be initiated in the same contract year as the approval. The final "leg" of the exchange must be completed within 365 days of the date the initial water was provided. Exchanges not completed within 365 days resulting in less water returned to a CVP contractor will be considered a transfer for the amount of water not returned. The water service actions for surplus water contracts, transfers, and exchanges are needed to allow for greater management options of CVP water by allowing NCVPCs to participate in water service actions with CVP Contractors to provide greater flexibility in matching excess supplies to deficient areas to balance existing water supplies in the lower San Joaquin Valley.

SCOPE

The existing water conveyance facilities allow Friant and Delta water to be physically exchanged and transferred among multiple water districts. For the purposes of this EA, it is assumed that any transfers from the CVP Contractors are compliant with the transfer provisions of Section 3405 of the CVPIA. Therefore, the CVP Contractors are not the focus of the analysis in this EA. The scope of this EA is focused on the effects of the conveyance and delivery of CVP water resulting from the execution of temporary 215

water service contracts, short-term one year water transfers from a Friant or Cross Valley CVP Contractor, and exchanges between Friant Division long-term Contractors and the NCVPC as identified below. The analysis includes the following:

- Environmental Analysis of the NCVPCs service areas with the focus on areas within the Friant POU boundaries.
- Transfers of CVP water to NCVPCs under Article 9 of the IRC and LTR contracts.
- Exchanges of CVP water to NCVPCs under Article 9 of IRC and LTR contracts.
- The focus of this EA is water originating from behind Friant Dam (CVP water)

- The exchanges could involve
    - Local groundwater resources
    - SWP water conveyed from the Delta
    - Other surface water supplies including rivers, creeks and streams.

Excluded from this EA are:

- Any transfers or exchanges that require the movement of water through facilities or structures that have not yet been built
- CVP Contractors south of the delta in the San Luis Unit and the Delta Division
- Long-term (beyond one year) banking of CVP water in groundwater banks
- Article 5 Exchange Provision of the LTRC allowing for initial delivery of CVP water to CVP Contractors on the CVC

Separate environmental documentation would be required for such actions.

The NCVPCs participating in this proposed action and potential CVP water service actions are located in Fresno, Kings, and Kern Counties in the southern San Joaquin Valley. The NCVPCs have not undergone environmental review for proposed water service actions to be approved by Reclamation. This EA serves to examine the NCVPCs in one collective environmental document for multiple water service actions involving CVP water, if approved. The purpose of this EA is to review each of the NCVPCs in sufficient detail to determine if the delivery of CVP water to the NCVPCs would result in significant impacts to environmental resources in the NCVPC service areas. This EA will also review the cumulative impact of transfers, up to 150,000 AF in a given contract year, from Friant and Cross-Valley CVP Contractors service areas.

This EA examines each of the NCVPCs in their entirety with emphasis on areas within the boundaries where Friant CVP water can be applied. Delta CVP water is not included in this Proposed Action. Each of these proposed water service actions will be examined individually for compliance with the applicable permits based on places and purposes of use. Some of the NCVPCs are not located wholly within the permitted POU as defined in Reclamation's water rights permits. Water districts with lands located partially outside the permitted place of use boundary(s) would be subject to the terms of Reclamation's water rights permits. Therefore, the main focus of this EA is the NCVPCs service areas that are capable of receiving CVP water originating at Friant. It is important to note the

use and application of Section 215 surplus water is not limited to the requirements under the Reclamation Reform Act. These high flood flows are available when water is abundant and difficult to quickly disperse to avoid flood damages downstream. Reclamation offers this surplus water to districts and enters into Section 215 Contracts for contractors to acquire these flood flows. Due to the urgency to disperse this water quickly there are no restrictions for where and how this water is used relative to the RRA.

The conditional pre-approval is not an automatic approval. Each proposed water transfer or exchange must comply with applicable permits, Federal, State and local laws prior to approval by Reclamation. Each transfer will be reviewed for consistency with this environmental assessment and in accordance with the transfer provisions of §3405 of CVPIA and interim guidelines including no third party impacts. Thirteen of the NCVPCs are individual entities and four are umbrella agencies, which comprise of numerous districts. Each of the thirteen districts that are individual entities may also be included in one of the four umbrella agencies. This overlapping of district boundaries results in duplication of analysis and variances when computing district acres to total acres.

1.0 PROPOSED ACTION AND ALTERNATIVES

Proposed Action
The conditional pre-approval is for three separate short-term water transactions to ensure efficient water management and allow maximum water management flexibility of both Irrigation and Municipal and Industrial (M&I) CVP water by and between multiple Friant Division and Cross-Valley CVP Contractors and a group of nineteen (19) NCVPC without adversely impacting third parties or resulting in significant impacts to the environment.

The proposed three categories of short-term water transactions are described in this EA as separate alternatives including the no-action alternative (Alternatives 1 thru 4). Each of the three short-term CVP Water transactions must occur within the given contract year. A contract year typically begins on March 1st and ends on the last day of February of the following calendar year. Reclamation anticipates that each of the 19 NCVPC would participate in the three proposed water transactions with the CVP Contractors. Reclamation only has jurisdiction over CVP water.

The three types of CVP water transactions necessary in effectuating the CVP Contractors proposed needs are:

Alternative 1. Execution of Temporary Section 215 Water Service Contracts with the NCVPCs for 215 water from the Friant Division and Cross-Valley CVP Contractors.

Alternative 2. Conditional pre-approval of Up to 150,000 af/y of Friant CVP Water Transfers from Friant and Cross-Valley CVP Contractors to the NCVPCs.

Alternative 3. Conditional pre-approval of Friant CVP Water Exchanges between Friant and Cross-Valley CVP Contractors and the NCVPCs

It should be noted the environmental analysis and initial internal review of any of the above alternatives does not result in automatic approvals. This EA and internal review will serve to streamline anticipated future requests for these water service actions through pre-approval subject to the conditions of meeting certain criteria, laws, quideslines and policy. Reviewing the CVP Contractors proposed temporary water service requests requires extensive Federal staff time and adds administrative costs, which could affect both the timing and the cost of the efficient and flexible water management of the CVP. Therefore, establishing and implementing a streamlined review process for the Irrigation and/or M&I CVP Water transactions will aide in lowering administrative costs, minimizing staff review time, and maximizing the flexibility of efficient CVP Water management.

These actions require that the following conditions be met:

! CVP water may be applied only to lands located within the permitted Place of Use boundaries,

! CVP water may be used for either Agricultural or M&I purposes,

! No native or untilled land (fallow for 3 consecutive years or more) may be cultivated with this water without a survey for the presence of federally listed or proposed threatened and/or endangered species,

! No new construction or modification of existing facilities is to occur in order to complete the proposed actions,

! No new water supplies are to be created, and

! No sale or transfer of Section 215 temporary water is to take place.

The following additional conditions also must be met for all transfers and exchanges:

! No impacts to a third party,

! All transfers and exchanges involving CVP water must comply with all applicable federal, state and local laws, regulations, permits, and policies in addition to applicable Biological Opinions including long-term contract renewal and interim contract renewal.

! Evidence of CEQA compliance with DWR for exchanges involving SWP supplies must be provided to Reclamation at the time the site-specific request for approval is made to the CO.

Additional environmental review would be required for proposed actions not meeting these conditions.

Alternative 4. No Action Alternative

Reclamation does not approve a multiple year environmental assessment and expedited internal administrative review of 215 surplus water contracts, water transfers and exchanges for the NCVPCs. The NCVPC could still request water service actions on an individual basis and separate environmental documents could be generated annually thereby increasing administrative costs and duplicating efforts. Requests from the NCVPC for temporary water service contracts for 215 water would not be processed in a timely manner decreasing Reclamation's flexibility in discharging and managing flood flows. Reclamation could disperse flood flows to the CVP Contractors with or without the proposed action. Furthermore, Reclamation could dispense the flood flows to the

NCVPC with or without the proposed action under emergency conditions via a categorical exclusion checklist provided sufficient data is provided for NEPA compliance.

Under the no action alternative, Reclamation does not approve a multiple year environmental analysis and administrative review of transfers of CVP water between CVP Contractors and NCVPCs nor exchanges of CVP for non-CVP water. The CVP Contractors would have decreased flexibility in managing their water supplies. Transfers could occur among the CVP Contractors. However, the transfer of CVP water would not occur between both the CVP Contractors and NCVPCs. Individual CVP Contractors could request to engage in CVP water transfers with the NCVPCs on an annual basis. Reclamation would not have an expedited review process resulting in increased administrative costs and duplication of efforts. In order to approve each transfer, exchange or delivery of Section 215 water, Reclamation would need to prepare yearly Categorical Exclusions (CE). Additionally, a CE would be necessary for all CVP contractors currently covered under the "Historic" EA, which expires 2-28-2005.

2.0 MANAGEMENT DIRECTION AND AUTHORITIES

Alternative 1. Executing Temporary Water Service Contracts (Section 215 Water)

Section 215 of the Reclamation Reform Act (RRA) defines Surplus Water as "(1) an unusually large water supply not otherwise storable for Project purposes; or (2) infrequent and otherwise unmanaged flood flows of short duration." This water is often referred to as Section 215 Water.

Execution of the Temporary Water Service Contract(s) (Contract) are authorized pursuant to the Act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto including the Act of August 26, 1937 (50 Stat. 844), as amended; the Act of August 4, 1939 (53 Stat. 1187); the Act of October 12, 1982, as amended; and the Act of October 30, 1992 (106 Stat. 4600) referred to as Reclamation Law. These short-term contracts may be executed annually, only upon a 215 declaration. The contract expires at the end of each contract year.

NEPA compliance for executing one year Section 215 Water Service Contracts has historically been achieved with a Categorical Exclusion [516 DM 6 Appendix 9.D.4 Consistent with 48 Federal Register 34263 (1983)]. In a letter dated November 2, 2001 to Service regarding the LTRC for the Friant Division, it is stated that within the Friant Division "The {Section 215} water {for NCVPC} would not lead to any land use changes, and would be delivered only to established crop lands, wildlife refuges, or groundwater basins". This statement will be honored in this document as well. However, because this is a multi-purpose proposal including the Temporary Contracts Reclamation has determined, and the participating NCVPC concur, that incorporating the Contract action into this extensive EA is economically feasible. The delivery of water via the Temporary Water Service Contracts proposed between the NCVPC and Reclamation is contingent upon the declaration of Section 215 water. Section 215 water may be applied to excess lands without RRA acreage limitations, but must be applied only to lands located within the Contractors' Service Areas and in accordance with Reclamation water rights permits.

The water delivered pursuant to the Contract may be used for either irrigation or M&I purposes. The water will be put to beneficial use (agricultural land currently in production) and no native, untilled lands may be cultivated as a result of the delivery of this water. In addition, the water must be applied only within the Contractors' Service Area. No new construction or modification of existing facilities is required to put this water to beneficial use. If construction or modification of existing facilities would be needed, separate environmental compliance actions and documentation will be required prior to approval of any said water action. Because the quantity and duration of Section 215 water is not predictable, Section 215 water is available only occasionally and usually it must be delivered on short notice pursuant to the following criteria:

- Water is made available under a Temporary Water Service Contract from the Friant Division of the CVP.

- Water is declared under Section 215 of the RRA is exempt from acreage limitations.
- No new water supplies are created.
- No sale or transfer of Section 215 water made available under this contract may take place without the contracting officer's approval and appropriate environmental review.
- The Contractor will participate in establishing and complying with the environmental commitments established between the Contracting Officer and the United States Fish and Wildlife Service (Service) resulting from the Endangered Species Act consultation.

Alternative 2. Transfers of Water, CVP to non-CVP

Reclamation anticipates water transfers, which are authorized pursuant to §3405 of the CVPIA between Friant Division and, Cross-Valley CVP Contractors and the NCVPC to occur in the future. These transfers are subject to the current and/or future administrative review and approval processes including Reclamation's Interim Guidelines for Implementation of Water Transfers under CVPIA dated February 25, 1993, and the Department of the Interior's Final CVPIA Administrative Proposal on Water Transfers dated April 16, 1998. Each transfer proposed under this project is subject to separate review before approval.

CVP water from the Friant Division allocated to the Friant Division Contractors and/or the Cross Valley Contractors or acquired via a LTRC Article 5 exchange, are being analyzed for transfer. In order to lower costs, minimize staff time, and to ensure efficient and flexible water management, a streamlined expeditious review process for transfers of either CVP Irrigation or M&I Water pursuant to Article 9 of the LTRC is needed. Criteria for said transfers are:

- CVP Water originating from Friant and transferred from a CVP Contractors within the Friant Division or Cross-Valley Division (diverted from the San Joaquin River at Friant Dam) to a NCVPC identified as typically surface water supplies that were originally delivered under an existing contract and subsequently determined available for transfer. Such transfers must adhere to the required consumptive use criteria set forth in the Interim Transfer Guidelines.
- Each transfer proposed pursuant to §3405 of the CVPIA will be reviewed and approved in accordance with current and future Reclamation Laws, policies, regulations, and guidelines. (Currently, the process includes both Reclamation's Interim Guidelines for Implementation of Water Transfers under CVPIA transfers dated February 25, 1993, and the Department of the Interior's Final CVPIA Administrative Proposal on Water Transfers dated April 16, 1998.)

- **Alternative 3. Exchanges of Water, CVP to non-CVP**

Reclamation also anticipates that water exchanges, authorized pursuant to The Reclamation Project Act of 1939 Section14, between Friant Division and Cross-Valley CVP Contractors and the NCVPC may occur.

CVP Contractors CVP Water and Section 215 Temporary Water originating from the San Joaquin River (stored at Millerton Reservoir of the Friant Division Project Facilities) and water originating from the Delta allocated to the Cross Valley Contractors are being considered for exchanges. In order to lower costs, minimize staff time, and to ensure efficient and flexible water management, a streamlined expeditious review process for transfers of either CVP Irrigation or M&I Water pursuant to Article 9 of the LTRC is needed. Criteria for the exchanges are:

- Exchanges are contemplated as a mechanism to improve water deliveries to Irrigation and M&I users in the southern San Joaquin Valley. Exchanges may aid in water conveyance cost reduction, timing of deliveries, delivery of non-CVP Water to excess lands, and to facilitate instantaneous exchanges in accordance with Section 426.15 of the RRA.

- Evidence of CEQA is required, when applicable.

- Exchanges of water under Article 5 for the Cross Valley Contractos are excluded from this assessment. These types of exchanges are analyzed in a separate environmental document.

- Proposed exchanges, outside of the 19 identified NCVPC's analyzed in this proposed action, would be reviewed under a separate process and environmental review.

All of the water actions analyzed in this assessment are subject to the provisions and terms for the protection of threatened and endangered species (T&E) in addition to the applicable Biological Opinions under the Endangered Species Act (ESA). As a condition of these Temporary Water Service Contracts, Transfers and exchanges, neither the CVP Contractors nor the NCVPC water application will adversely affect the presence of threatened or endangered species. Grasslands and shrub land that have never been tilled or irrigated will not be tilled and put into production using this Section 215 surplus water or CVP Water acquired via transfer or exchange. Land that has been fallowed, idled, and not cultivated on a temporary basis (less than three consecutive years) and rotated back into production is not considered conversion of a native habitat.

To ensure that native habitat will not be converted to irrigated agricultural usage with this water, nor that land use changes will occur, Reclamation requires that the following condition be met:

If crop-lands irrigated with water pursuant to this contract have remained fallow for three previous consecutive years, said crop-lands must be surveyed prior to the application of

such water via a process deemed appropriate by the Contracting Officer for the possible presence of Federally listed T&E species in which case, such lands may not be irrigated with this water.

Alternative 4. No Action

In order for Reclamation to meet the intent of the CVPIA and Water 2025, an increased flexibility in water distribution needs to be developed. The no action alternative in this circumstance is contrary to the implementation of greater flexibility.

3.0 PURPOSE AND NEED

Purpose and Need

The proposed action is to provide conditional pre-approval for multiple, one-year, temporary water service actions between Friant and Cross-Valley CVP Contractors and the NCVPCs as identified in this environmental assessment, as well as approval for 215 contracts between Reclamation and the NCVPCs. The water service actions include contracts for surplus water, transfers and exchanges between CVP Contractors and NCVPCs. The water service actions are needed to allow greater management options of CVP water by allowing NCVPCs to participate and provide greater flexibility in matching excess supplies to deficient areas in order to balance existing water supplies in the lower San Joaquin Valley. Many of these farmers in the smaller districts are quite dependent upon groundwater pumping. The amount of pumping in some of the smaller districts is depleting the groundwater reserves on both a local and a regional scale. Similarly, these farmers tend to pay increased energy costs in comparison to farmers in districts with more stable surface water supplies. The ability to receive these surface water supplies will increase the stability of the smaller farms in the Valley.

It should be noted the approvals for temporary water service actions are limited to a period of one-year or less. Exchanges must be initiated in the same contract year as the approval. Exchanges must be completed within 365 days from the date the initial water was delivered. Due to the uncertainty of duration and quantity of surplus water and the unpredictable amount of CVP water supplies available for transfers and exchanges within a water year, a multiple-year environmental assessment is preferred to expedite the annual recurring administrative process and to address cumulative effects.

The proposed action has five objectives:

- To allow the execution of temporary contracts for NCVPCs to receive surplus water and to best manage surplus water for protection of public safety and flood damage

- To include the NCVPCs under a multiple year environmental analysis and internal review for surplus water contracts, transfers and exchanges of CVP water and Non-CVP water

- To allow an expedited review and streamlined coordination by Reclamation for anticipated recurring proposals for water service actions and to avoid duplication of administrative processes

- To sustain permanent crops and orchards in dry years

- To allow greater flexibility in managing available water supplies, and

- To provide the assurance of uniform stipulations and requirements for the NCVPCs and CVP Contractors including compliance with applicable biological opinions. The CVP

Contractors have already undergone environmental review to receive surplus water and have executed contracts to receive surplus water and engage in transfers and exchanges of CVP water. These transfers and exchanges of Ag to Ag water have been deemed to have met § 3405 of CVPIA. Additional transfers and exchanges among the CVP Contractors that did not fall under § 3405 were analyzed in a 5 year EA, SCCAO EA-00-05 *Temporary Water Transfer and Exchange Friant Contractors.*

Purpose and Need for Alternative 1. Executing Temporary Water Service Contracts (Surplus 215 Water)

Surplus water is defined as non-storable flood flows. Due to certain hydrological conditions, surplus water is typically available when water supplies are abundant. This non-storable water results in a situation whereby Reclamation needs to dispense the water quickly and efficiently. The declaration of surplus water is often considered an emergency situation and offered to any Contractor having the physical capability to obtain the surplus water. However, a water service contract is needed to facilitate the terms and conditions for Contractors to obtain the CVP surplus water. The multiple year environmental analysis for water service contracts will provide an expedited internal review process for generating water service contracts to Contractors other than CVP Long-Term Contractors.

The NCVPC need surplus water to pre-irrigate their fields, control erosion, control frost, recharge groundwater and other beneficial uses. Section 215 water is not subject to the RRA and may be applied to excess lands. Transfers of Section 215 water are not typical, therefore, not part of this proposed action or analysis.

Purpose and Need for Alternative 2. Transfers of Water, CVP to non-CVP Contractors

The transfer of CVP water supplies from a CVP Contractor to a NCVPC is needed to manage water effectively throughout the southern San Joaquin Valley**.** Transfers provide for movement of water from areas having excess water to areas in need of this water to be put for beneficial uses. Due to various conditions, such as hydrological events, crop-planting decisions, crop marketing fluctuations, actual water demands, and farm practices within the lower San Joaquin Valley, a CVP Contractors may determine the district has water in excess of its needs. For the same reasons, other potential Contractors having the physical capability to obtain this water may determine they need this water in their district. The NCVPC need the water to balance out deficient water supplies for beneficial use of CVP water. The transfer of CVP water from a CVP Contractors to a NCVPC allows greater flexibility in the management of available water supplies.

Purpose and Need for Alternative 3. Review of CVP Water Exchanges

Exchanges involving CVP water are typically needed to allow better timing for deliveries of water. This flexibility of timing allows farmers greater choices for the type of crops to plant dependent on the market variables in effect at the time. This greater flexibility also allows for more consumptive uses of water that may otherwise not be used to the fullest extent.

4.0 AFFECTED ENVIRONMENT

As stated earlier, the CVP Contractors have already undergone extensive environmental review and are not the focus of this EA. The amount of water leaving the CVP Contractors under the transfers would be limited to a maximum of 150,000 af/yr. The water will be staying within the appropriate Place of Use and is a small portion of the more than 5 million af of water used in the valley on an annual basis.

Sections 4.1 through 4.7 describe the general geographic area of the southern portion of the San Joaquin Valley in general terms. Due to Reclamation's unfamiliarity with the NCVPC prior to development of this EA, Appendix A contains extensive descriptions of the geographic area of the NCVPC and their facilities. The NCVPC's are located in the southern portion of the San Joaquin Valley **(Plate 1,** located at the back of this document). Deer Creek & Tule River Authority, Kern County Water Agency, Kern Water Bank Authority and Kings River Conservation District all serve as umbrella agencies with multiple sub-entities and are described in Section 4.8. Water for the Friant Division comes from the San Joaquin River at Millerton Lake with a storage capacity of 520,000 acre feet. From there, water is released from the reservoir to the south via the 152-mile-long Friant Kern Canal (FKC). Water for the Cross Valley Canal Unit comes from northern California through the Delta Mendota Canal, California Aqueduct and the Cross Valley Canal.

4.1 Water Resources
See Plate 1, Non-Long Term Contractors

The amount of surplus water available each year is unpredictable and varies depending upon storm events. Contracts for Section 215 surplus water to NCVPC's are dependent upon when water becomes available as defined in Section 215 of the RRA. Temporary contracts for surplus water are not subject to the acreage limitations under the provisions of Section 215 of the RRA. CVP water delivered to CVP Contractors under existing water service contracts and deemed available for transfer or exchange varies from year to year and is dependent upon multiple hydrological conditions.

Table 2 reflects the primary surface water supply for each NCVPC. These surface water supplies are potential supplies for exchanges.

Table 1
Surface Water Supply

Non-Long-Term CVP Contractors	**Surface Water Supply**	**Uses**
Buena Vista Water Storage District	21,300 SWP; 145,000 Kern River	Ag
Cawelo Water District	45,000 SWP; Poso Creek in wet years only; 27,000 Kern River; 20,000 reclaimed oil field water	Ag
Consolidated Irrigation District	Kings River	Ag and M&I
Corcoran Irrigation District	40,000 Kings River	Ag

Deer Creek & Tule River Authority	137,400 FKC Class I; 271,280 FKC Class II; 66,100 Tule River; 5,000 Deer Creek; Intermittently from creeks	Ag
Kaweah Delta Water Conservation District	149,000 Kaweah and St John's River, Cottonwood Creek, Lewis Creek, Yokohl Creek; 80,000 Kings or Tule Rivers	Ag
Kern County Water Agency (includes KCWA Improvement District #4)	1,083,000 SWP; 466,633 mean runoff Kern River; Intermittently from Poso Creek; Caliente Creek; Kaweah, Tule, St Johns and Kings Rivers	Ag -except KCWA ID#4
Kern Delta Water District	25,500 SWP; 210,000 Kern River	Ag
Kern Water Bank	SWP and Kern River	Ag and M&I
Kings County Water District	150,000 Kings; 150,000 Kaweah Rivers	Ag
Kings River Conservation District	Over 754,000 Kings River based on hydrology and hierarchy for diversions; Mill Creek; Sand Creek; Wahtoke Creek; Kaweah, St Johns, Tule River via CVP exchange; and SWP	Ag
Lakeside Irrigation Water District	40,000 Kaweah; Intermittently from Cottonwood Creek, Cross Creek and Kings River	Ag
Liberty Water District	3,000 Kings River	Ag
North Kern Water Storage District	1.25 million SWP; 740,000 Kern River; Intermittently Poso Creek	Ag
Rosedale-Rio Bravo Water Storage District	29,900 SWP; 35,000 Kern River	Ag
Semitropic Water Storage District	155,000 SWP; 0-5,000 Poso Creek	Ag
Tulare Lake Basin WSD	96,277 SWP; 59,000 Kings; Intermittently from Tule and Kaweah Rivers	Ag

Water Conveyance Facilities

The FKC is a prominent feature in the southern San Joaquin Valley and provides for the transport of water through the southeastern portion of the San Joaquin Valley for delivery of water to CVP Contractors. The FKC extends 152 miles south from Friant Dam in Fresno County to the Kern River in Kern County four miles west of Bakersfield. The FKC exports water to areas in the Tulare Lake Hydrologic Basin.

The Cross Valley Canal began operations that routed water from the California Aqueduct to the east side of the San Joaquin Valley. The Cross Valley Canal was financed locally and began operations in 1975. The canal begins at the California Aqueduct near Taft and conveys water across the valley to the FKC near Bakersfield. The Cross Valley Canal is constructed so as to allow water to flow in either direction, conveying water to the east or to the west. The source of Cross Valley Canal water is from the Delta via State Water Project (SWP) or CVP facilities

The State of California constructed the California Aqueduct as part of the SWP. Operations began in 1972. Waters from the aqueduct flow out of the Delta near the City of Tracy to San Bernadino and Riverside into Lake Perris reservoir. Contractors have access to either the Cross Valley Canal and/or direct diversion from the California Aqueduct. Currently, the SWP imports about 1.36 million af of water to the San Joaquin Valley. Contracts executed in the early 1960s established the maximum annual water amount (entitlement) that each SWP long-term contractor may request from the SWP. These entitlements projected annual water needs at the time the contracts were signed. SWP delivers water to agricultural and M&I water contractors based on the criteria established in the 1996 Monterey Agreement, which applies equal deficiency levels to all contractors.

Water districts in the San Joaquin River Region have constructed extensive water conveyance systems to provide water throughout their districts. Water is conveyed through an intricate network of canals and aqueducts to provide water where needed. Water service contracts, transfers and exchanges are negotiated and executed in accordance with appropriate federal, state and local regulations and policies.

Although Reclamation does not have jurisdiction over non-CVP water, the following subsections are included for the purpose of discussing how non-CVP contractors are restricted in the transfer of their water supplies outside their service areas:

> Several NCVPC have the physical capabilities to transfer their SWP water outside their service areas and potentially to southern California via the California Aqueduct. (See **Table 1, Surface Water Supplies)** Such transfers are restricted by the provisions in Article 53 (d) (1-7) under the contracts for SWP water. SWP contractors (including NCVPC) having excess water for transfer notify the State Department of Water Resources (DWR) and a "pool" of water is established. SWP contractors have first priority to purchase the "pool" water. The State has an opportunity to purchase the water for providing additional carry over storage for SWP contractors. If there are more requests from SWP contractors to purchase more water than is available in the "pool", the water shall be allocated among those SWP contractors requesting such water in proportion to their annual SWP annual entitlements for that year up to the amount of their requests. If requests to purchase water from the "pool" are less than the amount available, the sale of "pool" water shall be allocated among the contractors selling such water in proportion to their respective amounts in the "pool". Any water remaining in the "pool" that is not withdrawn by the selling SWP contractor shall be offered by DWR to SWP contractors and non-SWP contractor and sold to the highest bidder, provided that if the highest bidder is a non-SWP contractor, all SWP contractors shall be allowed fifteen days to exercise a right of first refusal to purchase such water at a price offered by the non-SWP contractor.
>
> It is possible for NCVPCs with SWP supplies to engage in long-term transfers of their unneeded SWP entitlement water outside their service areas. However, they are subject to the terms and conditions of the Monterey Amendment. These long-

term transfers of entitlement water (also defined as Table A water) would be subject to approval by the Department of Water Resources and State Water Resources Control Board and would require environmental analysis under the California Environmental Quality Act (CEQA). Currently, none of the NCVPC have a long-term transfer contract with contractors in Southern California.

Several NCVPC have water rights of local water supplies and have the physical capability to transfer this water outside their service areas or to Southern California. (See **Table 1, Surface Water Supplies)** These water rights are subject to the restrictions under California water rights laws and the State Water Resources Control Board that prohibit the transfer of this water outside the permitted places of use without prior approval by the SWRCB for post-1914 rights and would be subject to CEQA review. Transfers of pre-1914 water rights outside their permitted place of use do not undergo approvals by the SWRCB, however, the no-injury rule applies. The amount of water in this proposed alternative is up to 150,000 af/y and would be used within the San Joaquin Basin to best manage current water supplies.

Reclamation has no jurisdiction over non-CVP water stored in underground facilities. Contractors having storage space in these facilities may extract non-CVP water for later use with or without this proposed action. This EA does not provide for the groundwater storage of CVP water in non-CVP contractor's areas for later retrieval beyond one year. Reclamation anticipates such requests however; separate environmental review would be required.

The surface water supply is used for reasonable and beneficial use. Groundwater is also pumped and is used for reasonable and beneficial use**.**

4.1.1 Groundwater

The southern portion of the San Joaquin Valley has experienced overdraft conditions. A more detailed discussion of groundwater levels is contained in Section 3.1.4 of this EA. Generally, water districts in and near Kern County experience the lowest groundwater levels. These areas are subject to local groundwater ordinances that restrict the transfer of this groundwater outside the basin. During dry years, additional groundwater is pumped to offset reduced surface water supplies and is typically used locally. The availability and amount of groundwater that would be transferred outside a district's boundaries or Basin is small and unlikely to occur consistently or long-term.

4.1.2 Groundwater Resources

The CVP Contractors and NCVPCs lie within the San Joaquin River and Tulare Lake ground water hydrologic regions. The regions are further divided into ground water sub-basins.

Tulare Lake Basin

The Tulare Lake Basin is bounded on the south by the Kings-Kern County line, on the west by the California Aqueduct, and the eastern boundary of Westlands Water District, on the north by the southern boundary of the Kings Basin, and on the east by the westerly boundaries of the Kaweah and Tule Basins. The southern half of the Tulare Lake Basin consists of lands in the old Tulare Lake bed in Kings County. The Kings, Kaweah and Tule Rivers flow into the land locked Tulare Lake Basin.

The following NCVPC are located in the Tulare Lake Basin: Tulare Lake Basin Water Storage District, Dudley Ridge WD, Salyer WD, Kings County WD, Stratford ID, Empire West Side ID, and Corcoran ID.

Kings Basin

The Kings Basin is bounded on the north by the San Joaquin River to the boundary of Farmers Water District, and on the west by the eastern boundaries of the Delta-Mendota Basin and the Westlands Water District. The southern boundary runs easterly along the northern boundary of the Empire Westside Irrigation District, the southern fork of the Kings River, the southern boundary of Laguna Irrigation District, the northern boundary of the Kings County Water District. The Basin also includes the area around Fresno, extending to the foothills. The water supply for this basin is the Kings and San Joaquin Rivers. The basin declined following the drought in the early1990's and has not yet recovered. The portion of the basin near Orange Cove declined during the drought but has recovered to pre-drought conditions.

The following NCVPC are located in the Kings Basin: Alta ID, Consolidated ID, Kings River Conservation District, Kings River WD, Laguna ID, Liberty WD, Mid-Valley WD, Raisin City WD, and Riverdale ID.

Kaweah Basin

The Kaweah Basin lies between the Kings Basin on the north, the Tule Basin on the south, the Sierra Nevada foothills on the east and the Kings River Conservation District on the west. The basin generally comprises lands in the Kaweah Delta Water Conservation District and encompasses the area around the City of Visalia. The Basin is supplied from the Kaweah and St. Johns Rivers. Ground water levels decline of over 20 feet during the drought but have recovered somewhat. North of Visalia, ground water levels have not completely recovered.

The following NCVPC are located within the Kaweah Basin: Kaweah Delta Water Conservation District, Kings River Conservation District, Lakeside Irrigation Water District, and Corcoran Irrigation Company.

The following contractors have promulgated Groundwater Management Plans:
Kings County Water District, Kaweah Delta Water Conservation District

Kern County Basin

The Kern County Basin is bounded on the north by the Kern County line, on the east by the Sierra Nevada foothills, on the south by the Tehachapi Mountains, and on the west by the Coast Ranges. Principal rivers and streams include the Kern River and Poso Creek. The basin includes the area south of Bakersfield and is supplied from the Kern River. The Basin declined steadily until the mid 1970's when it began to recover. The basin declined in the early 1990's in response to drought conditions but has begun to recover.

The following NCVPC are located in the Kern County Basin and all have or are drafting groundwater management plans: Buena Vista WSD, Cawelo WD, City of Bakersfield, Kern County Water Agency, Kern Delta WD, Kern Water Bank Authority, Rosedale-Rio Bravo WSD, Shafter-Waso ID, and West Kern WD.

Recharge of the semiconfined aquifer in the Regions is primarily derived from seepage from streams and canals, infiltration of applied water, and subsurface inflow. Precipitation on the valley floor provides some recharge, but only in abnormally wet years. Seepage from streams and canals is highly variable depending on annual hydrologic conditions.

4.1.3 Groundwater Storage and Production

The usable storage capacity was estimated to be approximately 24 million af for San Joaquin river region and 28 million af for the Tulare Lake Region. Department of Water Resources (DWR) estimated a level of ground water extraction that would not lower groundwater levels over the long-term (perennial yield) to be approximately 3.3 million af/y for the San Joaquin River Region. The perennial yield is 4.6 million af/y for the Tulare Lake Region. The perennial yield is directly dependent upon the amount of recharge received by the groundwater basin, which may be different in the future than it has been in the past.

Groundwater storage in San Joaquin Valley reached a low point in 1978, as a result of the 1976-1977 drought period. By the early 1980s, ground water storage returned to predrought conditions. Groundwater storage again declined during the 1987-1992 drought. At the end of the 1990 water year, ground water storage was similar to 1978 conditions. These area wide groundwater storage fluctuations in the San Joaquin valley basin are not uncommon.

Groundwater pumping ranged from 1.6 million af in 1922 to 4.7 million af in 1977. Groundwater pumping has been rising steadily through the 1970s, and has varied greatly from year to year depending on hydrologic conditions. The largest year-to-year fluctuation occurred during the 1976-1977 drought period. Immediately following the drought, hydrologic wet and above normal conditions for the years 1978 to 1980 resulted in reduced pumping. However, urban growth during the 1980s has contributed to an increase in groundwater usage. In addition, increased groundwater pumping in the late 1980s and early 1990s occurred as a result of reduced surface water deliveries to CVP water users due to the imposition of environmental requirements on the operation of

surface water facilities, and critically dry hydrologic conditions during the 1987 to 1992 drought period. DWR estimated that recent groundwater pumping (1990) in the San Joaquin River Region at 3.5 million af and Tulare Lake Region at 5.2 million af. This exceeds the estimated perennial yield in the San Joaquin River Region and by 200,000 af in the Tulare Lake Region by approximately 630,000 af. All of the basins within the San Joaquin River and Tulare Lake Regions experienced some overdraft.

4.1.4 Groundwater Levels

Expansion of agricultural practices between 1920 and 1950 caused declines in groundwater levels in many areas of the San Joaquin River Region. Along the east side of the San Joaquin River Region declines have ranged between 40 and 80 feet since pre-1860 development conditions.

Groundwater levels in the semiconfined aquifer between Spring 1970 and Spring 1980 declined in response to 1976-1977 drought conditions and recovered to near predrought levels by 1980. The 1987-1992 drought resulted in substantial deficiencies in surface water deliveries and corresponding increases in ground water pumping. Water levels declines of 20 to 30 feet are common throughout most of the central and eastern parts of the San Joaquin Valley.

During the 10-year period from Spring 1970 to Spring 1980, semi-confined groundwater levels generally dropped in the Tulare Lake Region. In portions of Fresno, Kings, Kern, and Tulare counties, semi-confined groundwater levels dropped as much as 50 feet since spring 1970. The semi-confined aquifer in the Tulare Lake Region showed little change between spring 1980 and spring 1988.

DWR collects and summarizes groundwater data for thousands of wells across the San Joaquin Valley. These data show the historical trends in groundwater elevation for the basins in the Friant Division and Cross Valley Canal Unit. The San Joaquin River Region is generally divided by two major basins, the San Joaquin and Tulare Lake Regions. These two regions are subdivided into several basins that are defined by geologic and hydrologic conditions. The subbasins and the associated water districts are discussed below.

Table 2 depicts the conjunctive use and groundwater plans for each of the NCVPCs.

Table 2
NCVPC Conjunctive Use and Groundwater Plans

Non-Long-Term CVP Contractors	Groundwater Management Plans	Conjunctive Use Facility
Buena Vista Water Storage District	Yes	Yes
Cawelo Water District	Yes	Yes
Consolidated Irrigation District	Yes	Yes
Corcoran Irrigation District	Yes	Yes
Deer Creek & Tule River Authority	--	--
Kaweah Delta Water Conservation	Yes	Yes

District		
Kern County Water Agency	No	Yes
Kern Delta Water District	Yes AB3030 SB938	Yes
Kern Water Bank	No	Yes
Kings County Water District	Yes	Yes
Kings River Conservation District	Yes	Yes
Lakeside Irrigation Water District	Yes	Yes
Liberty Water District	Yes	Yes
North Kern Water Storage District	Yes	Yes
Rosedale-Rio Bravo Water Storage District	Yes	Yes
Semitropic Water Storage District	Yes	Yes
Tulare Lake Basin WSD	Yes	Yes[1]

1. Due to the heavy clay soils in most of the Tulare Lake Basin Water Storage District, it is generally not possible to directly recharge the groundwater aquifers. Management of the groundwater resources in the District consists of indirect or in-lieu recharge.

4.1.5 Groundwater Quality

Groundwater quality conditions in the San Joaquin River Region and the Tulare Lake Region vary throughout the area. A description of specific water quality parameters is provided below.

Total Dissolved Solids (TDS)

TDS concentrations vary considerably in the San Joaquin Region depending upon the ground water zone. Characteristics of TDS in the Tulare Lake Region are similar to those occurring in the San Joaquin River Region higher than the east of the San Joaquin Valley. This distribution reflects the low concentrations of dissolved solids in recharge water that originates in the Sierra Nevada, and the predominant regional groundwater flow pattern. Typically, on the east side, TDS concentrations generally do not exceed 500 mg/L.

Boron

High boron concentration occur in the northwestern part of the San Joaquin River Region from the northernmost edge of the region to the southernmost edge of the region. In the southern portion of the Tulare Lake Region, high concentrations of born are generally found in areas southwest to Bakersfield (greater than 3 mg/L) and southeast of Bakersfield (1 to 4 mg/L). However, boron in groundwater in the Friant Division area is not identified as a concern.

Nitrates-Nitrate

Several small areas of the Tulare Lake Region contain nitrates-nitrate concentrations in excess of 10 mg/L. These include areas south and north of Bakersfield, around the Fresno metropolitan area and scattered areas of the Sierra Nevada foothills in the Hanford-Visalia area. Municipal use of groundwater as a drinking water supply is also impaired due to elevated nitrate concentrations in the Tulare Lake Region.

Arsenic

In the Tulare Lake Region agricultural use of groundwater is impaired due to elevated arsenic concentration in the Tulare Lake Region, particularly in areas of the Kern Basin near Bakersfield. Groundwater in the Friant Division area is not identified as a concern for elevated concentrations of arsenic.

Dibromochloropropane (DBCP)

DBCP has been detected in many groundwater wells in the San Joaquin River Region and the Tulare Lake Region. Municipal use of groundwater as drinking water supply is impaired due to elevated DBCP concentrations near the cities of Visalia and Bakersfield.

4.2 Soils

The soils of the San Joaquin Valley are divided into four physiographic groups: valley land soils, valley basin soils, terrace soils, and upland soils. Valley land and valley basin land soils characterized most of the San Joaquin Valley floor. Specifically, these soils characterize the land within the subject districts. Land areas within the CVP's place of use and in the vicinity of the FKC, valley land soils consist of deep alluvial and aeolian soils that make up some of the best agricultural land in California. The alluvial fans and plains consist of unconsolidated continental deposits that extend from the edges of the valley toward the center. Derived entirely from runoff from the Sierra Nevada, the alluvial material formed a level to rolling landscape. Soils formed in light to moderate coarse textured alluvium are derived from weathered granitic and sedimentary rock. The alluvial plains cover most of the valley floor and make up some of the intensely developed agricultural lands. The level to gently sloping soils of the valley surface layer range from sandy loam to clay. The valley soils are very deep to moderate deep and are generally well drained, with the exception of lands in the western portion of the valley underlain by shallow clay lenses.

Wind erosion of soils occur when high wind velocities combine with barren soil surfaces. Factors such as wind velocity, climate, soil moisture, width of field and quantity of vegetative cover affect the severity of wind erosion. Soil taken out of irrigation and allowed to remain barren with no cover vegetation will have greater losses to wind erosion than the same soils under a good crop and land management program with irrigation. Soils are also lost to water erosion. Level land erodes less than sloped land because flow velocities are less. Terrace and upland soils would be more susceptible to water erosion than soils on the valley floor.

Prior to the CVP, groundwater pumping in the San Joaquin Valley resulted in overdraft and land subsidence conditions. The CVP was constructed to provide flood control, delivery of surface water, and to alleviate the overdraft and land subsidence conditions.

4.3 Land Use

The study area includes the southern portion of the San Joaquin Valley and includes portions of Fresno, Kings, and Kern Counties. Historically, the San Joaquin Valley was lush with vast grasslands and wetlands. The Arkansas Act of 1850 made Federal lands available cheaply to farmers who would convert wetlands to croplands. The Federal

Flood Control Act of 1930 began the construction of the CVP. The advent of these Acts and the rich, fertile soil of the San Joaquin Valley have facilitated the establishment and expansion of agricultural lands that support livestock and crops. Towns and cities were developed to support the agricultural industry. The major cities include Fresno, Visalia and Bakersfield. The development of urban and agricultural lands has caused the loss of natural habitat. The habitat types and cropping patterns for the non-Long-term CVP Contractors are depicted on the maps in the appurtenant Biological Assessment for this project. The land use between Fresno and Bakersfield along the Hwy 99 corridor, along the eastern boundary of the study area, is mainly agricultural lands supporting orchards, vineyards, croplands, pastures and dairys. Land use inside the western boundaries of the study area support mainly orchards, vineyards, croplands, pastures, intermittent with swathes of grasslands, shrub, brush or mixed rangeland. Land use on the south and southeast boundaries of the study area near Bakersfield is intensely cultivated, primarily by orchards, vineyards, field crops, pastures and intermittent swathes of grasslands or mixed rangelands.

4.4 Wildlife

Beginning in 1991 the FWS Biological Opinions specified how water should be delivered to most of the Friant Division Project water service Contractors to avoid jeopardy to endangered and threatened species and committed Reclamation to developing and implementing a long-term program to address the needs of listed endangered species in the San Joaquin Valley. The *Biological Opinion on U.S. Bureau of Reclamation Long Term Contract Renewal of Friant Division and Cross Valley Unit Contractors*, dated January 19, 2001 is the most recent biological opinion issued by the FWS for the Friant Division Project water service Contractors. The Contractors in this proposed action will sign a binding letter of agreement restricting the use of this water to avoid environmental impacts.

The CVPIA established an environmental restoration fund that all CVP contractors pay on an acre foot basis for CVP water received; this restoration fund is an annually adjusting charge. In addition to the restoration fund; all Friant-Kern Canal, Madera Canal and Millerton Lake Service Area contractors pay the Friant surcharge of $7.00 on each acre foot of CVP water received. CVP water supplies originating in the Delta have been reduced for fish and wildlife purposes. The CVPIA dedicates 800,000 acre-feet of CVP yield to environmental purposes and further mandates the delivery of full supplies of water to wetland habitat areas.

4.5 Socio-Economic Resources

The CVP water service area of the CVP Contractors and NCVPC's is primarily rural agricultural land. There are many communities across the area where farm workers reside. The small businesses that support agriculture such as feed and fertilizer sales, machinery sales and service, pesticide applicators, transport, packaging, marketing, etc. rely on the efficient and cost effective use of water in the surrounding agricultural lands. The cost and availability of water has a direct secondary impact on the communities of the area.

4.6 Electrical Power

The Friant Power Authority (FPA) operates three separate power plants located at Friant Dam. One at the headworks of the Madera Canal, one at the headworks of the FKC and one at the river outlet works. The project was constructed by the Friant Power Authority to take advantage of the energy available at Friant Dam and existing outlet structures from Millerton Reservoir. The project was completed in 1986 and has a Federal Energy Regulatory Commission license to operate until 2032. The power is sold to Pacific Gas and Electric Company. The three power plants were designe for an aggregate generating capacity of 25 megawatts; however historic maximum generating capacity has been shown to be 32 megawatts. Historically, the maximum capacity of 32 megawatts, providing power to 32,000 homes during the month of July. These conditions occur due to the combination of snow-melt, hydrologic conditions and irrigation demands for water during the month of July.

As discussed in Section 3.1.4 of this EA, groundwater levels vary throughout the San Joaquin Valley. In some areas the groundwater level is 300 feet below the surface. The extraction of groundwater from these levels in some cases results in decisions to use alternative sources of water supplies due to the cost in energy and electrical power.

4.7 Cumulative Effects - Description of Past, Present, and Future Actions

The cumulative effects section will examine the past, present, and reasonably foreseeable future actions related to the proposed actions and no action alternatives.

The Programmatic Environmental Impact Statement (PEIS) for the Central Valley Project Improvement Act, October 1999 provides an inclusive description of the CVP and SWP. The PEIS for the CVPIA is hereby incorporated by reference to limit the need to re-evaluate the region-wide and cumulative effects analysis. The following discussion is a summarization of Past Actions.

Past Actions

The Arkansas Act of 1850 made Federal lands available cheaply to farmers who would convert wetlands to croplands. Farmers were attracted to the San Joaquin Region because the climate and the soils provided the vital elements to support agricultural practices. Marshlands were converted that once supported vast amounts and diverse types of wildlife in the San Joaquin Region. Cultivation of lands expanded and the agricultural industry flourished. Small towns and businesses developed along the Highway 99 corridor to support the thriving agricultural industry. With the expansion of the agricultural industry, farmers began to pump groundwater at a rate that exceeded the natural recharge of rainfall and streambeds to the aquifer resulting in overdraft and land subsidence conditions. To alleviate groundwater overdraft and land subsidence the Friant Division Project Facilities (FDPF) were constructed to provide a supply of surface water to be used in conjunction with groundwater for irrigation.

Prior to construction of the FDPF, the San Joaquin River often overflowed its banks during the late winter months. The FDPF were constructed to aid in the management of varying fluctuation of flows in the San Joaquin River. Reclamation will continue to

manage and disperse surplus water in the best interest of the people of the United States, as in the past.

The FDPF of the CVP began operations in 1949. Since that time, the water in the San Joaquin River has been diverted into the Madera Canal and FKC except for an amount necessary to support riparian water rights and instream flows from Friant Dam to Gravelly Ford. The stretch between Gravelly Ford and the Mendota Pool is usually dry except during wet years. This lack of in stream flows has resulted in diminished aquatic and riparian habitats in the river corridor; resulting in a decline in the number ond density of species present in the San Joaquin River corridor. River bank erosion, agricultural practices and other industrial activities have deteriorated the river bank integrity along the San Joaquin River. This has in turn led to the loss of internal stream dynamics that would otherwise ameliorate the effects of high flows in the river.

Present Actions

The San Joaquin River Region is known worldwide for its production of agriculture products and has been hailed by some as the "bread basket of the world". The agricultural industry is a vital factor in the economy for California. Cities such as Visalia and Fresno benefit from agricultural industries that provide local jobs. Employment opportunities abound for farm labor workers and this supports a large Hispanic population in the region. The agricultural industry is of vital importance for communities in the San Joaquin Valley.

The San Joaquin River Region is a patchwork of agricultural fields. Very little habitat for wildlife exists; and what land that is suitable for wildlife is very fragmented. Small populations of various species are confined to disjunct areas with little opportunity of co-mingling. The wildlife must compete for available resources within confined habitats in order to maintain sustainable populations. Wildlife populations have been declining from loss of habitat.

The water project facilities in the San Joaquin Region are operated in a manner similar to the past with some operational modifications to comply with the Central Valley Project Improvement Act (CVPIA) of 1992. The CVPIA has many components including the allocation of 800,000 acre feet of CVP yield for habitat uses. Water service contracts are negotiated and executed; water transfers and exchanges are reviewed for compliance with all federal, state and local regulations prior to approval. Requests for Warren Act Contracts are reviewed in accordance with all pertinent regulations to allow non-CVP water to be conveyed in the CVP facilities. Because of the vast array of actions over the last century, it is impossible to determine the specific causes and effect of the declining resources with respect to any one factor, such as the CVP. Through the CVPIA, Interior is developing policies and programs to improve environmental conditions that were affected by operations, management, and physical facilities of the CVP. The CVPIA also includes tools to facilitate larger efforts in California to improve environmental conditions in the Central Valley and San Francisco Bay-Delta system.

An inventory of major Federal authorities and State Water Resources Control Board decisions that affect the Central Valley Project is contained in the PEIS on pages I-8 thru I-10 in Table I-1. Other efforts are underway to manage the delicate balance of needs for all competing water users. The Environmental Water Account is a component of the CALFED Bay-Delta Program and has been established as a means to bank water for the purpose of providing water for fish and wildlife.

Habitat Conservation Plans and water conservation measures are being developed and implemented. Studies are currently conducted on the stability of the San Joaquin River banks by the Army Corp of Engineers for flood control information. The San Joaquin River Riparian Habitat Restoration Project (SJRRHRP) is conducting studies to provide data on increased flows in relation to the strength of the banks and levee systems. The SJRRHRP will be developing and proposing a riparian habitat restoration plan that includes delivering water down the San Joaquin River. The Lower San Joaquin River Levee District maintains the levees and coordination of efforts is ongoing.

Several strategies are underway for managing the finite water supplies and to correct unsatisfactory environmental conditions. Such strategies are water conservation measures, water banking, land fallowing and land retirements. Water banking is a management strategy that stores surface water underground for later use. Land fallowing allows lands to rest from cultivation for a short period of time, thus freeing up water and decreasing water usage for that piece of land. The Land Retirement Program is designed for the federal government to purchase agricultural lands that are drainage impaired on the west side of the San Joaquin Valley and take those lands out of production permanently. Restoration projects and test plots on currently retired lands are investigating management practices to restore retired lands to native habitat. The Panoche Drainage District on the western side of the valley actively manages land within their district boundaries for the amelioration of agricultural drainage problems. The San Joaquin Basin Action Plan discusses wetland habitat areas and requires that water entering the wildlife refuges contain less than 2 parts-per-billion (ppb) selenium. Selenium in concentrations greater than 22ppb is known to cause death or congenital disfigurement to wildlife.

The San Joaquin River Region is experiencing an increase in population due to lower housing costs compared to costs in the coastal and bay areas. Cities such as Fresno, Visalia, and Bakersfield are growing and development management plans are being produced to deal with the influx. The increase in population to the San Joaquin Valley is causing farmers to succumb to the economic benefits of selling their farmland for development. Agricultural lands provide food and shelter for wildlife. The diminishing farmlands contribute to fewer habitat types for fowl and wildlife.

The Grasslands Bypass Project (GBP) will continue using a 28-mile segment of the San Luis Drain to convey agricultural subsurface drainwater to a point of discharge at Mud Slough on the San Joaquin River system. The GBP occurs within other regional efforts to manage agricultural subsurface drainage in the San Joaquin Valley. These efforts include *A Management Plan for Agricultural Subsurface Drainage and Related Problems*

on the Westside San Joaquin Valley, San Joaquin Valley Drainage Program, September 1990 and ongoing San Joaquin Valley Drainage Implementation Program implementation activities; *The San Luis Drainage Program* managed by Reclamation; *San Joaquin Basin Action Plan* under the CVPIA; and State and Regional Water Quality Control Programs.

The Bureau of Reclamation has released the Draft Environmental Impact Statement (EIS) for the San Luis Drainage Feature Re-evaluation for public review and comment. Reclamation has been re-evaluating options for providing drainage service to the San Luis Unit of the Central Valley Project. Drainage service alternatives in the Draft EIS are aimed at maintaining environmental quality and providing for continued agricultural production. The Draft EIS is available online at http://www.usbr.gov/mp/nepa. Additional information is available at: http://www.usbr.gov/mp/sccao/sld/index.html .

Future Actions

The State Board and Reclamation are proposing to expand the CVP Consolidated Place of Use to include lands adjacent to the existing CVP service area.

Two petitions are currently before the State Board for the Friant Places of Uses to include CVP water service to lands.

The Refuge Water Conveyance Study initiated by Reclamation identified the need to improve or construct water conveyance facilities to deliver Level 2 and Level 4 water supplies in accordance with the 1998 Refuge Water Supply Study and the San Joaquin Basin Action Plan. Environmental documentation is being prepared for the facilities.

The SWP Supplemental Water Program allows the transfer of unused water rights, CVP water contracts, or SWP entitlements to water users that have an unmet water demand.

The Friant Inflow Analysis would investigate the potential water supply benefits of working with the owners of reservoirs upstream of Millerton Lake. This project could identify alternatives to manage the basin water supply that would increase the supply in certain water year types or provide a water supply to a new use.

The California State Clearinghouse database at www.ceqanet.ca.gov lists environmental documents for proposed actions. A review of this database indicates that several activities are proposed that support the trend of population growth. The Cities of Fresno and Bakersfield are revising their general plans to facilitate residential construction. Several water projects are proposed including constructing groundwater storage facilities, banking, exchanging, and transferring water. Several environmental projects are proposed including purchasing lands to protect wildlife, restoring habitat, and obtaining water for refuge supply.

Many environmentally supportive projects are in various stages of development and execution. Funding sources must be identified and partnerships are needed to provide a collective approach for implementation.

5.0 Environmental Consequences

5.1 Alternative 1
Temporary Surplus Section 215 Water Contractors

5.1.1 Water Resources **Alternative 1**

Under the proposed action, surplus water would be offered first to the CVP Contractors in accordance with all applicable guidelines. Depending upon the amount of surplus water available and the decisions of the CVP Contractors, the remaining surplus water would be offered to the NCVPC. Due to the unreliability and short duration of the availability of surplus water there would be no significant impacts to the CVP Contractors or NCVPC. Neither the CVP Contractors or NCVPCs would plan or implement permanent strategies for the use of the surplus water. The decision to accept or decline the delivery of surplus water is based on the hydrological conditions and amount of surplus water available at the time it is offered. As stated earlier, Reclamation may have at some time in the past entered into temporary contracts for Surplus 215 Water with some of the NCVPCs to quickly disperse emergency flood flows. Reclamation may at any time enter into Surplus 215 Water contracts with any willing contractor. Temporary contracts for Surplus 215 water do not become effective until after a declaration of Surplus 215 water is made. Surplus 215 water contracts do not result in less water or less frequency of water in the San Joaquin River. The decision by Reclamation to disperse flood flows and offer Surplus 215 Contracts depends upon timing and amount of water. Reclamation coordinates with the ACOE, Friant Water Users Authority and the Fresno Metropolitan Flood Control District to manage flood flows prior to declarations of available surplus water. In certain years flood waters have flowed down the San Joaquin River.

Current operations of the Friant Division Project Facilities include dewatering between the reach of Gravelly Ford and the Mendota Pool of the Joaquin River. The river channels have become destabilized. Levees were built with the expectation that current operations of the Friant Division Project Facilities would continue along historical procedures. Reclamation is currently conducting studies to determine the results of increased flows down the San Joaquin River. The studies are needed prior to proposing a riparian restoration plan along the banks of the San Joaquin River. The modeling efforts will provide information to assess changes in water surface elevation given various assumptions about riparian vegetation and channel geometry, levee setbacks, reviews of flood operations, armoring the levees, and engineering specific levee breaches to maximize habitat restoration and reduce losses due to floods. Adjacent landowners and municipal interests are concerned that increased flows into the San Joaquin River could cause flood damage. The San Joaquin River Riparian Habitat Restoration Pilot Project 2003 is currently underway and will data for the studies. The collection of the data, interpretation, and environmental analysis will not be completed before this proposed action is considered. Until consensus is reached regarding restoration of the San Joaquin River, or until legally required otherwise, the diversion of CVP water to the Madera and Friant-Kern Canals will continue. The dispersal of surplus water to willing buyers is the most economical means to manage the flood water. Current efforts are underway to

develop models. The proposed action would not interfere with any Reclamation obligations to deliver CVP water. The Proposed Alternative action would not affect CVP or SWP operations and would not change the existing diversion points.

5.1.1.1 Groundwater **Alternative 1**

The availability of Section 215 water is unreliable and does not increase groundwater pumping. However; during periods of Section 215 releases, less groundwater could be pumped providing a short-term benefit and would not lead to any long-term or significant impacts to groundwater quality or quantity. Executing contracts for surplus water, when available, for the NCVPCs would provide an opportunity to use less groundwater and provide direct groundwater recharge with desired benefits without increasing historical use.

5.1.2 Soils **Alternative 1**

Due to the unpredictability and availability of surplus water, landowners are unlikely to make decisions to fallow land or not irrigate. Pre-irrigation would occur with or without executing contracts for surplus water. Controlling erosion and applying irrigation water to soils is best planned with reliable sources of water. The timing and amount of surplus water available is unpredictable and the execution of temporary Section 215 water service contracts for the delivery of surplus water to the NCVPC would not result in long-term or significant impacts to soils.

5.1.3 Land Use **Alternative 1**

Converting lands entails long term planning and reliable water supplies. Due to the unpredictability and small amount of the surplus water there would be no changes in land use as a result of the delivery of Section 215 CVP water.

Section 215 water is not subject to land restrictions of the RRA. Section 215 water is usually available during hydrological events when fields are saturated and additional water is unwanted by landowners. The application of surplus water to ineligible or excess lands as defined in the RRA provides an economical means to disperse this flood water without causing long-term or significant impacts to the environment.

5.1.4 Wildlife Resources **Alternative 1**

Under the Proposed Action, no native, untilled lands would be cultivated, tilled or irrigated with the surplus water. The surplus water would be put to beneficial use. Due to the short duration and variable amounts of CVP water involved, these contracts would not result in impacts to wildlife or special status species.

Under the proposed action, Reclamation's contract execution would be conditioned with the following terms:

> "The Endangered Species Notice to the Friant Division Water Service Contractors noted that some types of surface disturbing activities would require consultation with the Fish and Wildlife Service. The intent is that irrigation activities not affect the presence of threatened or endangered species. Grasslands and shrub

> land that have never been tilled or irrigated must not be tilled and put into agricultural production using this water. If the land has been fallow for three consecutive years or more, Reclamation must inspect it for endangered species."

Under the Proposed Action Alternative, there would be no construction or modification of CVP facilities. The proposed action would not interfere with CVP obligations to deliver water to other CVP water service Contractors or fish and wildlife areas. Specifically, the distribution of surplus water would not affect unique geological features such as wetlands, wild or scenic rivers, refuges, flood plains, rivers placed on the nationwide river inventory, or prime or unique farmlands. Since no surface disturbance would occur, no species listed or proposed to be listed as endangered or threatened, would be affected.

5.1.5 Socio-economic Resources Alternative 1

Under the Alternative 1, seasonal labor requirements would not change, and businesses that support agriculture would not be financially harmed.

5.1.6 Electrical Power Alternative 1

It is unlikely for surplus water, when available, to provide an opportunity to produce the maximum capacity of 32 megawatts of power at Friant Dam. In order for the maximum capacity to be produced, water would have to flow at optimal levels throughout the entire FDPF's facilities. The availability of surplus water is unpredictable and of short duration. Surplus water is usually available during times when the demands for water are low. Hydrologic conditions may be quite different between the north and south regions in the hydrological area. Requests for surplus water from Contractors throughout the hydrological area may be inconsistent resulting in surplus water flowing in the FKC and not the Madera Canal. The proposed action Alternative could result in a slight increase of power generation. However, the inconsistency of available surplus water and unlikely demands for water would make it difficult to achieve the optimum opportunity to produce the maximum capacity.

As stated earlier, the delivery of surplus water could result in less groundwater pumping and decreased demands on power associated with pumping groundwater. This decrease in demand would be temporary and would not result in any significant impacts to energy resources. However; a reduction in groundwater pumping could temporarily lessen the amount of electrical usage as well as reduce the number of diesel groundwater pumps operating in the Valley. These two decreases in power demand could have a positive effect on the electrical availability and air quality in the Valley.

5.1.7 Environmental Justice Alternative 1

The market for seasonal workers on local farms draws thousands of migrant workers, commonly of Hispanic origin from Mexico and Central America. The population of some small communities typically increases during late summer harvest, overwhelms local water and sewage facilities and causes public health problems. The service area of the FKC has a stable economy based on intensely developed irrigated agriculture. The crops are predominately permanent plantings of citrus, nuts, and grapes.

The Proposed Action for temporary Section 215 water service contracts would not cause any harm to minority or disadvantaged populations. The distribution of surplus water would allow the Contractors to supplement the water supplies in their service areas. The surplus water supply may allow farmers to pre-irrigate to protect permanent orchards that require much field labor for pruning and harvest and sustain employment opportunities.

5.1.8 Cumulative Effects Alternative 1

Under the proposed action, the review and administrative process to execute contracts for surplus water would be accelerated compared to the past review process for these contracts. Each surplus water contract would be temporary, for one year or less. Surplus water is intermittent and unpredictable. Therefore, the duration of each surplus water contract and availability of this water would limit any cumulative impacts. Moreover, the contracts would not result in less water in the San Joaquin River. The decision to execute the Section 215 contracts are made after a declaration of Section 215 water is made. Alternative 1 would not establish a precedent for future actions. The multiple year environmental assessment would simplify the review and administrative process for executing temporary surplus water contracts and provide flexibility to better manage the finite water supplies. Reclamation has determined that there would be no significant cumulative effects to CVP operations from the proposed action. The approvals for Section 215 contracts would limit uses of this surplus CVP water. This water would not be applied to native lands. Due to the short duration and amount of surplus water available contractors would not formulate long-term planning strategies or decisions that would rely on the delivery of surplus water.

5.1.9 Archeological and Cultural Resources Alternative 1

The San Joaquin Valley is rich in historical and pre-historic cultural resources. Prior to the 18th Century, many Native American tribes inhabited the Central Valley. It is possible that many cultural resources lie undiscovered across the valley and along rivers and waterways. It is unlikely they are within the right of way of existing man-made facilities. The availability of this surplus CVP water would not affect any cultural resources. The surplus CVP water would be conveyed in existing facilities and canals to established agricultural land. No excavation or construction is required to convey the surplus CVP water and no untilled, native land would be irrigated with the surplus CVP water.

5.1.10 Indian Trust Assets Alternative 1

The proposed action would not impact Indian Trust Assets.

5.2 Alternative 2
Transfers of CVP Water from CVP Contractors to NCVPC

5.2.1 Water Resources Alternative 2

The CVP Contractors completed water needs assessment based on projected water needs to 2025. These projections indicated demands would be unmet with current water supplies. Due to varying hydrological conditions, fluctuating markets for agricultural

commodities, inclusions and exclusions of lands from water district boundaries and other reasons, excess CVP water may become available for transfer intermittently and sporadically over the next several decades. Transfers of water to areas in need allows for efficient management of water that has already been appropriated under the long-term contracts. Under the long-term contracts, the whole available supply of the Friant project has been appropriated. The temporary redistribution of any water that may not be of immediate benefit to the long-term contractors increases the efficiency of the system and limit losses

Proposed transfers may include the transfer of water either from an Ag user to another Ag user, an Ag user to M&I user, an M&I user to Ag user. Reclamation bills contractors based on the end use of the water and applies the appropriate rates for Ag and M&I water.

The total amount of water proposed for transfer is up to 150,000 af/y from CVP Contractors to NCVPCs. The total amount of CVP contract water supplies to the Friant Division is 2,115,975 af/y The NCVPC's total amount of surface water supplies are over 3 million af/y. Under Alternative 2, the transferred CVP water does not increase overall water supplies, but rather moves water to areas in need within the lower San Joaquin Valley. The movement of this comparatively small amount of water within a single contract year within the lower San Joaquin Region would not result in any significant impacts to surface water resources.

It is possible a specific CVP Contractors could transfer CVP water to a specific NCVPC each contract year. It is also possible for CVP water delivered to a NCVPC could free up non-CVP supplies for transfers outside the NCVPC's service areas and outside of the San Joaquin Valley.

The subsequent sale (transfer) of non-CVP water freed up as a result of deliveries of CVP water is constrained by multiple laws and policies. However these laws do not expressly prohibit such transfers. The cumulative effects section below discusses the laws and impacts to such subsequent transfers. Reclamation does not have approval authority for non-CVP water supplies. The purpose for this proposed action is based upon the NCVPC's needing and using this CVP water within their service areas within the same water year. Each proposed transfers would undergo review for consistency with this EA, compliance with applicable state, federal and local laws including the transfer provisions in Section 3405 of the CVPIA.

5.2.1.1 Groundwater **Alternative 2**

NCVPC located in areas with overdraft conditions are less likely to pump groundwater with the proposed action. Areas with severe overdraft conditions currently have or are in the process of developing groundwater management plans. The delivery of CVP water into the NCVPC areas could provide localized and short-term relief to overdraft conditions. Under Alternative 2, the transferred water is moved only within the San Joaquin Valley and does not provide additional water to alleviate the region-wide overdraft problem. The transfers of CVP water to NCVPC's would not result in any

significant impacts to groundwater quantity. As discussed in Section 3.3 of this EA, certain NCVPC's experience high concentrations of boron, nitrates nitrate, arsenic and DBCP in groundwater supplies. These NCVPC's do not supply M&I water and rely mainly on imported or local surface water supplies. The application of CVP water in these areas would provide temporary relief to the groundwater quality. The small amount of water available for transfer, temporary nature of these transfers, the uncertainty of availability of the water and willing sellers or buyers results in sporadic transfers that would not result in any long-term benefits or significant changes in groundwater quality.

5.2.2 Soils Alternative 2

The management of vegetation and soils for the purpose of controlling erosion are typically based on firm water supplies. Decisions by CVP Contractors and NCVPC to engage in transfers of CVP water are contingent upon the hydrological conditions occurring at that time.

The development of the CVP and SWP has partially mitigated land subsidence in the San Joaquin Valley. Land subsidence is caused by a reduction in the volume of pore-space within the soil. The most suceptable soils are clays, and the clay soils in the valley have lost significant volume over the last century and a half. This subsidence is primarily non-recoverable. Dry year pumping contributes to land subsidence. Conjunctive use programs provide water for irrigation by storing surface water in the aquifer. This water is placed in the aquifer through infiltration ponds operated by groundwater banks. It is anticipated during wet years, groundwater pumping would decrease allowing for the recharge of aquifers and stabilization of subsidence. As mentioned earlier, each proposed transfer would undergo separate review and be subject to applicable laws including the no-injury rule including land subsidence issues. Under Alternative 2, transferred water out of the CVP Contractors service areas and into the NCVPC's service areas would not result in long-term or region-wide impacts for land subsidence or soils.

5.2.3 Land Use Alternative 2

Under this proposed alternative, each proposed transfer of CVP water would be reviewed in accordance established criteria and, if approved, would occur within the same water year. The proposed transfers may include the sale of Ag water for M&I use. This small amount of water, its uncertainty of availability, and short duration would not provide incentives for developers or planners to construct new homes, businesses or make long-term land use changes or decisions. For these same reasons, land use changes are unlikely to occur as a result of the proposed alternative. The transfer of CVP water to NCVPCs would not result in significant impacts to land uses or contribute to growth or urban sprawl.

As stated earlier, CVP water transferred into the NCVPC's service areas could free up non-CVP water for transfers outside the San Joaquin Valley. Subsequent transfers by the NCVPC, as a result of delivering CVP water supplies, outside the San Joaquin Basin would undergo stringent approval processes. These transfers would be governed by DWR, SWRCB, the Districts and applicable local, state and federal laws. A more complete discussion is located in the cumulative effects section below.

5.2.4 Wildlife Alternative 2

Although several NCVPC and CVP Contractors have critical habitat, threatened or endangered species located within their service areas, this proposed alternative would restrict the water to lands already under cultivation. In some cases, CVP Contractor may decide to fallow lands which frees up water for transfers. If lands are fallowed for three consecutive years, they would be inspected for threatened or endangered species. No new, native lands would be tilled as a result of the proposed alternative. . Similarly, the CVP Contractors are subject to existing Biological Opinions.

In certain proposed transfers, CVP water could be conveyed in rivers or natural waterways resulting in fluctuations in water levels. Without specific transfer proposals, the timing and amount of water involved for transport in natural waterways are difficult to predict in this EA. The natural waterways in the San Joaquin Valley have been used primarily as water conveyance facilities for the last century. Many of the rivers and streams flowing into the east side of the valley only have water in them during flood events or when they are being used to transfer water within the districts. Transfers would be subject to all applicable laws including the no-injury rule. Each proposed transfer will be evaluated for third party effects and in-stream uses prior to approval.

5.2.5 Socio-economic Alternative 2

The CVP Contractors and NCVPCs exist for the primary purpose to provide water supplies to their respective landowners and customers. Farmers exist to grow crops for a profit. Typically, farmers fallow their lands based on a market based economy and hydrological conditions. Under Alternative 2, the proposed transfer of up to 150,000 af/y of CVP water, by itself, would not provide an incentive for farmers to fallow their lands for the purpose of selling water to make a profit. However, these proposed transfers, if approved, could help offset costs for not farming crops due to undesirable market or hydrological conditions. The proposed transfers would allow additional options to sell water to the NCVPCs and greater flexibility for the farmers to offset their costs and maintain the local economic vitality.

The depth to groundwater is different in each of the NCVPC’s service areas.
Under Alternative 2, the transferred CVP water could result in less groundwater pumped by the NCVPC's, thereby decreasing energy costs for the NCVPCs. This benefit would be small, localized and short term and would not result in significant impacts to the economy or energy resources. Conversely, NCVPC's could pay increased costs to convey CVP water to their Districts. Without specific transfer proposals, these variables in cost fluctuations are difficult to predict in this EA.

The amount of transferred CVP water is up to 150,000 af/y compared to over 3 million af/y of CVP, SWP and local surface water supplies in the study area. This small amount of transfer water would not result in significant impacts to water service contractors or third parties.

Recent developments have decreased supplies in southern California increasing demands and potentially heightening costs for water. This higher cost could provide incentives for

NCVPC's to transfer in lower priced CVP water and subsequently sell their non-CVP water to southern California. However, there are several laws and local restrictions for transferring water outside of district boundaries. These laws and restrictions of such transfers and potential impacts are discussed in the cumulative effects section below.

5.2.6 Electrical Power Alternative 2

Under Alternative 2, power generation at Friant Dam would not change since the water available for transfer would have already passed the turbines. The transfer of up to 150,000 af/y of CVP water from a CVP Contractor to a NCVPC could result in increased power usage to convey the water to its new destination. It is difficult to determine in this EA the actual amounts of increased power without specific transfer proposals. Most of the CVP Contractors are "uphill" from the NCVPC and costs to convey the CVP water would be minimal. In addition, the transfer of up to 150,000 af/y of CVP water from CVP Contractors to NCVPC could result in less groundwater pumping by the NCVPC's. The reduction of groundwater pumping would lessen the amount of electrical usage as well as reduce the number of diesel groundwater pumps operating in the Valley. These two decreases in power demand could have a positive effect on the electrical availability and air quality in the Valley.

5.2.7 Environmental Justice Alternative 2

The intra-Basin transfers would maintain existing croplands and job opportunities for migrant workers. Under Alternative 2, transfers from CVP Contractors agricultural districts to NCVPC M&I districts are permissible. The CVP Contractors primarily exist to provide water supplies to their customers and landowners to grow crops. CVP Contractors could make water available for transfer from landowners fallowing their lands reducing workable acreages for migrant workers resulting in increased distances to travel to find job opportunities. The proposed transfers would be temporary and short-term actions and would not result in significant impacts to migrant workers. Transfers of non-CVP water outside the San Joaquin Valley could result in less cultivated lands and displaced migrant workers as discussed below in the cumulative effects section.

5.2.8 Cumulative Effects Alternative 2

The proposed transfers are intra-basin transfers of CVP water from CVP Contractors to NCVPCs. Water is moved from areas with excess water to areas in demand within a single water year to support existing croplands or M&I facilities. It is anticipated demands for water will surpass available supplies as indicated in the CVP Contractor's Water Needs Assessments and less CVP water would be available to transfer in the future driving costs higher.

In wet years, Class 1, Class 2 and surplus water (Section 215) could be delivered. In some years, hydrological conditions could be wetter on the east side and drier on the west side of the San Joaquin Valley and similarly, there could be higher precipitation in the north compared to the south. In wet years, the full 150,000 af/y could be transferred to the NCVPCs. The historical maximum delivery from the Friant Division facilities is 2,115,975 af of Class 1 and 2 water. The proposed 150,000 af/y of Friant CVP water for

transfer is approximately 7% of the historical maximum deliveries, not including Section 215 water.

The proposed 150,000 af/y is an "up to" amount. In normal years, the amount available for transfer may be 150,000 af, or less, depending upon hydrological conditions and annual allocations. In critically dry years or extended periods of dry seasons, the amount available to transfer could be zero.

The districts manage water to meet customer demands. Typically, the priorities are for M&I purposes and to irrigate permanent crops. Irrigable lands are planted to crops or fallowed based on hydrological conditions and forecasted water supplies. The proposed transfers of up to 150,000 af/y of CVP water, when available, would help to offset the variable conditions to meet demands within the lower San Joaquin Valley. The proposed transfers do not provide a long-term or reliable water supply. Providing up to 150,000 af/y of water to the NCVPCs is a small amount of water when compared to over 3 million af/y of non-CVP water supplies available in the lower San Joaquin Valley. The CVP water available to transfer has already been allocated and no additional water would be diverted from rivers.

It is feasible a specific CVP Contractor could transfer the water to a specific NCVPC annually. However, this would not likely occur due to fluctuating hydrological conditions and with the open and competitive water market. Moreover, water transfers occurring consecutively between a specific CVP Contractor and a NCVPC for the same amount of water would require additional environmental review and separate approval.

The SWP contractors must provide sufficient data that adequate groundwater supplies are available to meet demands prior to approvals by DWR to transfer SWP water to the Environmental Water Account (EWA). The transfers of CVP water to SWP contractors could temporarily increase groundwater supplies to free up SWP water to sell to the EWA at higher rates. The higher rates provide an incentive for selling water to benefit fish and wildlife purposes so long as other willing buyers do not offer higher amounts and out-compete the EWA program.

As stated earlier, Reclamation does not have approval authority for non-CVP water actions. It is physically possible for NCVPC's to transfer their non-CVP supplies outside the area of origin and San Joaquin Valley as a result of transferring in CVP water.

The potential cumulative effects of these subsequent transfers outside the San Joaquin Valley include decreasing and converting farmlands, decreasing opportunities for the agricultural industry in the San Joaquin Valley, displacing low-income workers, less habitat areas for fish and wildlife, increasing or decreasing groundwater pumping, and degrading groundwater quality. The potential cumulative effects for southern California contractors include induced growth and increased water costs.

Freeing up other water supplies and subsequent transfers as a result of Alternative 2 are physically feasible. However there are legal constraints on these transfers creating disincentives.

The following is a discussion of applicable laws restricting transfers of SWP water, water rights water and groundwater:

SWP Water Transfers

Under Article 56, (Monterey Amendment) of the SWP contracts, transfers water is declared as Table A water and is accounted for in a Turn-back Pool. Table A water is defined as the amount of SWP water set forth in Table A in each of the SWP contractor's Water Supply Contract, which the State makes available for delivery to the SWP contactors at the delivery structure provided for the contractors. Table A water that is not needed by a SWP contractor can be sold back to DWR, and is kept in Turnback Pool A. The water in the Turnback Pool A will then be sold piecemeal or in whole by DWR to another SWP contractor. The program allows SWP contractors to sell unneeded SWP water, but gives the seller no control over who may purchase this water.

Generally, no SWP will be sold outside the contractor's service area. There are two exceptions to this policy. The first exception involves a landowner in one SWP's contractor's service area that also owns the land in another service area (SWP or other contractor). The Department of Water Resources (DWR) may approve such a transfer outside the service area. An example of this is a landowner owns land in both Tulare Lake Basin Water Storage District and Westlands Water District and requests transfers of small amounts of SWP water (usually 5000 af or less) outside the service area. The other exception involves Table A water which are considered permanent (long-term) transfers to another SWP contractor. These permanent transfers have been allowed under the 130,000 af Monterey Amendment provision, and to a lesser extent, outside the 130,000 af based on economic reasons but only between SWP contractors. For additional information of the Monterey Amendment and program see DWR's webpage http://wwwswpao.water.ca.gov/contract/pool.html.

Water Rights Water

Water rights are categorized as either pre-1914, post-1914, riparian or appropriative. Changes to the water rights would be required if transfers would be inconsistent with the Place of Use, Purpose of Use and Points of Diversion. It should be noted that Pre-1914 water rights holders do not require SWRCB approval for transfers. Complying with Section 1706 of the Water Code is the responsibility of the water right holder, and if challenged, the courts.

Water Code Section Excerpts

This section is excepts from the California Water Code located on the Internet at: http://www.leginfo.ca.gov/cgi-bin.

Water code 22259 - Applies to Irrigation Districts. If its board deems it to be for the best interests of the district, a district may enter into a contract for the lease or sale of any surplus water or use of surplus water not then necessary for use within the district, for use either within or without the district.
Water Code 31023 - Applies to County Water Districts. 31023. A district may sell water or the use thereof for any useful purpose and whenever there is a surplus, dispose of the surplus to municipalities, public agencies, or consumers located without the district.
Water Code 35425 - Applies for State Water Districts. If its board deems it to be for the best interests of the district, a district may enter into a contract for the lease, sale, or use of any surplus water not then necessary for use within the district, for use either within or without the district.
Section 384 - Prior to serving water to any person for use outside the agency, the agency shall comply with all provisions of the general laws of this state relating to the transfer of water or water rights, including, but not limited to, procedural and substantive requirements governing any change in point of diversion, place of use or purpose of use due to such transfer.
Section 385 - No water may be transferred pursuant to this chapter for use within the boundaries of a local or regional public agency that furnishes the same water service to the transferee without the prior consent of that agency.
Section 386 - The SWRCB may approve any change associated with a transfer pursuant to this chapter only if it finds that the change may be made without injuring any legal user of the water and without unreasonably affecting fish, wildlife, or other instream beneficial user and does not reasonably affect the overall economy of the area from which the water is being transferred.
Section 470 - Known as the Costa-Isentberg Water Transfer Act of 1986 that declares transfers on an intermittent basis can result in a more efficient use of water.
Section 1215 - Applies to exporters of water from protected areas including the San Joaquin River System and Delta.
Section 1216 - States that "A protected area shall not be deprived directly or indirectly of the prior right to all the water reasonable required to adequately supply the beneficial needs of the protected area, or any of the inhabitants or property owners therein, by a water supplier exporting or intending to export water for use outside a protected area pursuant to application to appropriate surface water filed, or groundwater appropriations initiated, after January 1, 1985."
Section 1745.04 - Transfer of Water. A water supplier may contract with a state drought water bank or with any other state or local water supplier or user inside or outside the service area of the water supplier to transfer, or store as part of a transfer, water if the water supplier has allocated to the water users within its service area the water available for the water year, and no other user will receive less than the amount provided by that allocation or be otherwise unreasonably adversely affected without that user's consent.
Section 1745.05 - Water Eligible for Transfer. (a) Water stored by the water supplier and water made available from either of the following sources may be

transferred by the water supplier pursuant to Section 1745.04: (1) Conservation or alternate water supply measures taken by individual water users or by the water supplier. (2) Water developed pursuant to a contract by a water user to reduce water use below the user's allocation or to eliminate the use of water during the water year, including a contract to grow crops without the use of water from the water supplier, to fallow land, or to undertake other action to reduce or eliminate water use. (b) The amount of water made available by land fallowing may not exceed 20 percent of the water that would have been applied or stored by the water supplier in the absence of any contract entered into pursuant to this article in any given hydrological year, unless the agency approves, following reasonable notice and a public hearing, a larger percentage.

CALFED Water Transfer Program- CALFED Water Transfer Subcommittee is currently developing standard analysis sets at a programmatic level to disclose likely third party impacts. These standards will not specifically address or analyze any specific transfers, level of transfer activity, or site-specific information. The Water Transfer Program describes a strategic plan of actions, policies, and processes to facilitate the further development of the water transfer market in California, while protecting water rights and area of origin priorities and providing safeguards against source area environmental and economic impacts.

Groundwater

Groundwater is basically treated as a local water supply and has little statewide regulation of its use. Areas with overdraft conditions develop groundwater management plans. Water Code Section 10750 (also known for the legislation that established this code: AB 3030) allows the general development of groundwater management plans. Some of the Water Code Sections establish local groundwater management plans for specific areas of the State. Water Code section 1745.1 provides that a water user who transfers surface water pursuant to 1725 and 1735 may not replace that water with groundwater unless the groundwater use is either of the following: (1) Consistent with a groundwater management plan or (2) Approved be the water supplier from whose service the water is to be transferred and that the water supplier, if a groundwater management plan has not been adopted, determines that the transfer will not create, or contribute to, conditions of long-term overdraft in the affected groundwater basin.

Water Code Sections 1215 and 1216 deals with groundwater diversions These diversions are subject to similar provisions under the Watershed Protection Statute (11460). Therefore, other users wishing to export or transfer groundwater from a protected basin would be required to comply with this requirement. DWR, SWRCB or Reclamation do not have permitting authority or oversee groundwater extractions.

Theoretically and physically, the NCVPC could receive CVP water resulting in excess non-CVP water to be transferred out of the San Joaquin Valley and to southern California. The amount of water that could be transferred from CVP Contractors to NCVPC is up to 150,000 af/y. If CVP water freed up a like amount in the NCVPCs service areas for sale to the highest bidder, the NCVPC would have made a profit that would not have been possible without the transfers under Alternative 2. This increase could result in out-competing refuges and smaller, less affluent water districts for the purchase of water.

As stated earlier, each proposal would undergo separate reviews prior to approvals. Each proposal would include the Criteria Checklist for a Complete Written Transfer Proposal (Criteria Checklist). This Criteria Checklist addresses how the water is made available, fallowing, conservation, and requirement for substituting groundwater use for surface supply including a study or evaluation of groundwater supplies demonstrating that the transfer will have no significant long-term adverse impacts on groundwater conditions, inter-related surface streams, or other groundwater supplies in the service area or a comprehensive evaluation of the potential impact on groundwater supplies accompanied by an adopted groundwater management plan.

Transfers are considered beneficial uses of existing water supplies already diverted from surface water sources and would not result in cumulative or long-term effects. The availability of water to transfer is driven by myriads of reasons including conveyance limitations, timing of water deliveries, hydrological conditions, crop patterns, water demands, economical conditions and agricultural market. Water transfers are temporary actions that do not provide long-term reliability for long-term land use changes. The selling of water is conducted between willing sellers and willing buyers and prices vary depending upon time of year, economical and market fluctuations for crops, and hydrological conditions.

Federal agricultural water is marketed at subsidized prices, whereas, non-CVP water is typically higher in cost. The purchase and selling of water is conducted in an open market, i.e., to the highest bidder. Reclamation does not interfere with the open market prices. The proposed water transfer alternative could result in incentives for landowners to make money in this open market. However, this incentive is small and unlikely due to the existing laws prohibiting adverse impacts to third parties, restrictions for transferring groundwater, and a compelling drive for farmers to continue growing crops in the suitable soils and climatic conditions of the lower San Joaquin Valley. As stated earlier, the transfer of non-CVP water is subject to a myriad of laws governing the transfers, and changes in place of use, purpose of use and points of diversions. These applicable laws do not explicitly prohibit transfers outside of the area of origin but do place constraints and disincentives on such transfers. The NCVPC's intent and the purpose and need for the exchanges and transfers alternatives are to use the CVP water in addition to their existing supplies within their district's service areas. Reclamation does not have approval authority for transfers of non-CVP water and may not be aware of cases whereby landowners market their non-CVP supplies as a result of deliveries of CVP water.

Reclamation would require the NCVPCs and CVP Contractors to provide annual transfer and exchange data for tracking purposes.

5.2.9 Archeological and Cultural Resources Alternative 2

Under Alternative 2, the transfer water would be conveyed in existing facilities. No construction or land disturbances would be required to deliver the water. The water would be used for existing M&I facilities or applied to existing agricultural lands in the NCVPC's service areas. This proposed action, would not result in any significant impacts to archeological or cultural resources.

5.2.10 Indian Trust Assets Alternative 2

The water would be transferred under existing contract provisions to known contractors and applied on existing agricultural lands or M&I facilities. The proposed action would not result in any significant impacts to Indian Trust assets held by the Government.

5.3 Alternative 3
Exchanges of CVP Water between CVP Contractors and NCVPC

5.3.1 Water Resources Alternative 3

As stated earlier in this EA, groundwater banking is not included in this proposed action. Reclamation anticipates requests and subsequent environmental review for groundwater banking in the near future. Under Alternative 3 , this EA provides a five-year environmental review of exchanges of CVP water and non-CVP water that would occur within a single water year and would not result in any significant impacts to water resources. The proposed action involves equal amounts of water exchanged between contractors and would not increase or decrease water supplies in either district or contactor's service area. The water proposed for exchange would be water already diverted from surface water supplies and would not result in increased diversions of surface water. No new conveyance facilities would be constructed to facilitate the exchanges. Non-CVP water would not be introduced into CVP facilities to convey the potential exchanges. The proposed exchanges would not result in any impacts to water quality or quantity.

5.3.1.1 Groundwater Alternative 3

The exchange of CVP water and non-CVP water would not result in any significant impacts to groundwater resources or contribute to land subsidence. The district or contractor exporting water to another district would receive a like amount of water within the same water year. Groundwater levels, quantity, and quality would not change on a long-term basis as a result of proposed exchanges.

The exchange of CVP water and non-CVP water between CVP Contractors and NCVPC would not cause any long-term changes or significant impacts to TDS, Boron, Nitrates-Nitrate, Arsenic or DBCP. Exchanges typically are proposed to deliver water to areas with insufficient supplies due to lack of rainfall. A like amount of water would return to replace the water. Exchanges are temporary and intermittent actions. In some cases,

proposed exchanged could result in less groundwater pumped and could result in slight benefits to the soils and groundwater in a constituents area, however, these benefits would be short-term and not result in significant impacts.

5.3.2 Soils Alternative 3

The exchange of CVP water and non-CVP water between CVP Contractors and NCVPC's would occur within a single water year. Exchanges between agricultural CVP Contractors and agricultural NCVPC's and would not result in an increase or decrease of water applied to soils. Specific proposed exchanges could include M&I water to be exchanged with ag water, or vice-a- versa. These exchanges are temporary actions and the water would be returned in a like amount within the same water year and would not result in any changes or long-term impacts to soils, land subsidence or overdraft conditions.

5.3.3 Land Use Alternative 3

The exchange of CVP water and non-CVP water between CVP Contractors and NCVPC would not result in any significant impacts to land use. Each proposed exchange would be reviewed on a case-by-case basis and would meet the parameters of this EA, Biological Assessment, Biological Opinion, CVPIA, RRA, and applicable laws. CVP water delivered to agricultural NCVPC's under this alternative would be restricted to lands already cultivated. NCVPC's having M&I as a purpose of use would be examined and determinations would be made at the time specific exchanges are proposed for cost adjustments, water uses and location in accordance with appropriate water rights permits relating to the origin of the water. The exchanged water would not result in any significant impacts to land uses or cause growth to occur. The availability of exchanged water is dependent upon uncertain conditions. The delivery and return of the like amounts of water would occur within the same water year. These variables would not provide an incentive for developers or planners to construct new homes or businesses or cause farmers to make changes in land uses.

5.3.4 Wildlife Alternative 3

Proposed exchanges of CVP water and non-CVP water between CVP Contractors and NCVPC would not affect threatened or endangered species or wildlife. Exchanges are short-term actions with a like amount of water returned within the same water year. Water would be delivered to established agricultural lands or M&I uses. These exchanges would not contribute or provide incentives for farmers to cultivate additional lands or for developers and planners to construct additional homes or businesses. Native habitat would not be converted as a result of proposed exchanges. Under Reclamation's current water rights permits, Friant water is not permissible for delivery to refuges, the CVP Contractors pay a restoration fee in lieu of providing water for refuges. The NCVPC's would be party to these fees for water originating behind Friant Dam. This proposed action and conditional pre-approval does not include deliveries or actions with refuges. It is anticipated that refuges, including the Kern National Wildlife Refuge and Environmental Water Account (EWA), would propose to engage in temporary water service activities with the NCVPC's for available non-CVP water that may become available due to this action.

5.3.5 Socio-economic Alternative 3

The proposed action for conditional pre-approval for exchanges of CVP water and non-CVP between CVP Contractors and NCVPC would not result in any significant changes to agricultural lands or crop production. Exchanges typically are a water management tool to sustain existing croplands and the economy. NCVPC's and CVP Contractors having M&I water supplies have a firm supply at higher fees and rates than agricultural water supplies. Exchanges of water are temporary actions and would occur within a single water year. Water would be returned in like amounts and not cause an imbalance of existing economic conditions.

5.3.6 Electrical Power Alternative 3

The proposed blanket environmental review and exchanges would not result in any impacts to power generation at Friant Dam. CVP Water proposed for exchange would already be delivered out of Friant under existing water service contracts and use of that water for power generation would not change. Some proposed exchanges could result in a slight benefit as less groundwater may be pumped in areas of overdraft conditions. This reduction in pumping also results in less power usage. Due to the short-term and intermittent occurrences of exchanges, the decreased power usage would not result in significant impacts to energy resources.

5.3.7 Environmental Justice Alternative 3

The proposed action would not result in significant impacts to low income or disadvantaged populations. Exchanges are a water management tool to sustain the agricultural industry including jobs for migrant workers. In addition, exchanges sustain M&I uses including local businesses and jobs. The water would be returned in a like amount within a single water year and would not decrease or increase job opportunities on a long-term basis.

5.3.8 Cumulative Effects Alternative 3

Exchanges of CVP and non-CVP water between CVP Contractors and NCVPC would not result in any significant impacts or cumulative effects. A like amount of water is returned to the same contractor and service area within the same water year. Any impacts would be short-term and no increases or decreases of water would occur within the service areas of transferor or transferee.

5.3.9 Archeological and Cultural Resources Alternative 3

Under Alternative 3 , the exchange water would be conveyed in existing facilities. No construction or land disturbances would be required to deliver the water. The water would be used for existing M&I facilities or applied to existing agricultural lands in the NCVPC's and CVP Contractors service areas. This proposed action, would not result in any significant impacts to archeological or cultural resources.

5.3.10 Indian Trust Assets Alternative 3

The water would be exchanged under existing contract provisions to known contractors and applied on existing agricultural lands or M&I facilities. The proposed action would not result in any significant impacts to Indian assets held in trust by the Government.

5.4 Alternative 4
No Action Alternative

5.4.1 Temporary Section 215 Water Service Contracts Alternative 4

Without this conditional pre-approval the NCVPCs could request and negotiate Section 215 water contracts. However, the annual review of the legal, technical and environmental aspects of each request for a surplus water service contract would hinder flexibility and discourage the timely distribution of unstorable and potentially damaging water. Reclamation may not be capable of completing each proposal in a timely manner as needed to fulfill the purpose of the CVP facilities to restrain overdraft and land subsidence conditions for the lower, eastern portion of the San Joaquin Valley. Flood control releases from Millerton Lake could occur and flow into the San Joaquin River and the Delta benefiting riparian habitat and fish, however these releases into the River are not considered bennifical use under the Friant Division in the CVPIA and will be avoided. Due to the short duration and availability of surplus water the benefits would be temporary. Under Reclamation's water rights permits for water stored behind Friant Dam, deliveries to refuges are not included as a purpose of use. The no action alternative for not approving the blanket EA for the consideration of annual temporary 215 water contracts for the NCVPC is the same as current conditions and would not result in any significant impacts to resources. Currently Section 215 contracts are covered with a categorical exclusion. In very wet years, it is possible that not all of the requests for section 215 water would be granted due to high workload within Reclamation, resulting in spill to the Kern River or flooding within the Friant system.

5.4.2 Transfers and Exchanges Between CVP Contractors and NCVPC Alternative 4

Under the no action alternative for exchanges of CVP and non-CVP water, Reclamation does not conditionally pre-approve any of these transfers or exchanges. The CVP Contractors could still request to engage in exchanges with NCVPC's on an annual basis, but Reclamation would not have the benefit of a streamlined administrative and review process to examine these alternatives and their cumulative impacts in one encompassing document. CVP water would be delivered to LTRC and would remain in their service areas or be transferred and/or exchanged amongst the LTRC. Reclamation does not have approval authority for Non-CVP water within the NCVPC's service areas. The no action alternative does not change current conditions, but may hinder the ability of the NCVPC's to obtain water at the most beneficial times of the year for crop production.

5.4.3 Water Resources Alternative 4

The no action alternative would have no effect on current water resource use. However, it is anticipated that the current water operations models for the CVP and SWP will not be able to keep up with the increasing demands for water in California. Inaction at this time may prove more costly in the future, as water project operations will eventually need to be streamlined and integrated to meet future demands.

5.4.3.1 Groundwater **Alternative 4**

The no action alternative will have no effect on the current groundwater use practices. Some of the practices currently employed are considered detrimental to the resource; the proposed actions may alleviate some of the conditions contributing to the excessive groundwater pumping.

5.4.4 Soils **Alternative 4**

The no action alternative will have no effect on the soils of the Central Valley.

5.4.5 Land Use **Alternative 4**

The no action alternative will may lead to increased fallowing of agricultural lands as non-CVP water continues to become more expensive. These potential land use changes may have a positive impact on some species of concern and a negative impact on others. The additional fallowing of land may have a detrimental effect on the community of migrant workers, agricultural support workers and consumers in the central valley and the U.S. as a whole.

5.4.6 Wildlife **Alternative 4**

The no action alternative may have an effect on wildlife, as additional land in the NCVPC's may fallow lands due to increasing non-CVP water prices. The increased fallowing of land may affect some species positively, and other species negatively. The analysis of these potential effects is beyond the scope of this document.

5.4.7 Socio-economic **Alternative 4**

The no action alternative will may lead to increased fallowing of agricultural lands as non-CVP water continues to become more expensive. The additional fallowing of land may have a detrimental effect on the community of migrant workers, agricultural support workers and consumers in the central valley and the U.S. as a whole.

5.4.8 Electrical Power **Alternative 4**

The no action alternative may lead to increased demands for electrical and diesel power to pump groundwater in the NCVPC's.

5.4.9 Environmental Justice **Alternative 4**

The no action alternative may result in significant impacts to low income or disadvantaged populations. Exchanges and transfers are a water management tool to sustain the agricultural industry including jobs for migrant workers. In addition, exchanges and transfers sustain M&I uses including local businesses and jobs.

5.4.10 Cumulative Effects **Alternative 4**

The no action alternative may serve to exacerbate the problems of an already strained water management system in California. To meet the increasing demands of varying water users in the central valley, a high degree of flexibility needs to be obtained. The current system is quite rigid and provides many disincentives for creative water

management in the Valley. The proposed actions should serve to make the system more flexible so that more needs can be met with the finite amount of water currently available.

5.4.11 Archeological and Cultural Resources Alternative 4

The no action alternative will have no effect on archeological or cultural resources.

5.4.12 Indian Trust Assets Alternative 4

The no action alternative would not result in any significant impacts to Indian assets held in trust by the Government.

6.0 ENVIRONMENTAL COMMITMENTS

The contracts for the delivery of temporary surplus water to the non-Long-Term CVP Contractors would include the same measures listed in Section 1.1, Proposed Action, of this document. In addition, the NCVPC would sign an agreement letter to comply with the biological opinions for the Friant Division Project Facilities. or enter into their own BO with Service

The Proposed Action (delivery of Section 215 water, and transfers and exchanges of CVP to non-CVP (NCVPC) water), requires the following six conditions:

! May be applied only to lands located within the applicable Place of Use boundaries,

! May be used for either Agricultural or M&I purposes,

! No native or untilled land (fallow for 3 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 new water supplies are created, and

! No sale or transfer of temporary water is to take place.

The following additional conditions also must be met for all transfers and exchanges:

! There can be no impact to a third party resulting from these actions,

! Transfers and exchanges cannot alter the flow regime of natural waterways or natural watercourses such as rivers, streams or creeks, ponds, pools, wetlands, etc., so as to have a detrimental effect on fish or wildlife or their habitats,

! All transfers and exchanges must comply with all applicable federal, state and local laws, regulations, permits, and policies

! Reclamation will review each transfer or exchange proposal for compliance with the above conditions prior to approval and execution of the action.

It is against these criteria, that the Effects Analysis for each species in the Biological Assessment was considered. Proposed transfers or exchanges that do not meet all of the above conditions and criteria would require subsequent environmental review and analysis.

7.0 CONSULTATION AND COORDINATION

Reclamation informally consulted with the Fish and Wildlife Service (FWS) during the development of this environmental assessment. In addition, Reclamation prepared a Biological Assessment for the proposed actions. No consultation under the Endangered Species Act with the National Marine Fisheries Service (NMFS) was required for this proposed action because Reclamation determined this program would not affect any listed species under the jurisdiction of NMFS. This determination was made because approvals for the proposed action alternatives would be consistent with and within the requirements of the Friant and Operations Criteria and Plan biological opinions addressing species that are NMFS's responsibility.

For the FWS, this determination is based on similar rationale for aquatic species under FWS's jurisdiction. The Friant and Cross Valley Division Long-Term Renewal Biological Opinion states that certain temporary water service actions would undergo separate determinations under the ESA, therefore this EA and corresponding BA have been prepared to examine the NCVPC's service areas and to comply with the Biological Opinion. For terrestrial species, Reclamation has also determined that the proposed alternatives would not likely adversely affect any listed species. Reclamation is consulting with the FWS. The FONSI and approvals for the proposed alternatives would be subject to the terms and conditions issued by the FWS.

FISH AND WILDLIFE COORDINATION ACT (16 USC sec. 651 et seq.)

The Fish and Wildlife Coordination Act requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources. None of the Proposed Alternatives would require construction for water development projects. No significant, unmitigable impacts to wildlife would occur under the Proposed Alternatives and no further coordination/consultation would be needed with the Service or the California Department of Fish and Game.

ENDANGERED SPECIES ACT (16 USC Sec.1521 et seq.)
Section 7 of the Endangered Species Act requires federal agencies, in consultation with the Secretary of the Interior, 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 concluded that the proposed action would not likely adversely affect any listed or proposed for listing threatened or endangered species. Reclamation is consulting with the Service in accordance with The Biological Opinion for the Long Term Contract Renewal of Friant Division and Cross Valley Unit Contracts. This Biological Opinion, under Section 1-3, Contract Items to be Handled Under Separate ESA Determination, states that surplus flood flow water contracts will require separate determinations regarding their potential effects on threatened and endangered species and critical habitat pursuant to section 7 and/or section 10 of the Endangered Species Act. The FONSI and approvals for the

Proposed Action and Alternatives would be subject to the terms and conditions issued by the Service.

NATIONAL HISTORIC PRESERVATION ACT (15 USC Sec. 470 et seq.)

Section 106 of the National Historic Preservation Act requires federal agencies to evaluate the effects of federal undertakings on historical, archeological and cultural resources. The proposed actions would not affect features or resources that have been identified in the NCVPC's service areas.

EXECUTIVE ORDER 11988 - FLOODPLAIN MANAGEMENT AND EXECUTIVE ORDER 11990-PROTECTION OF WETLANDS

Executive Order 11988 requires federal agencies to prepare floodplain assessments for actions located within or affecting flood plains, and similarly, Executive Order 11990 places similar requirements for actions in wetlands. The Proposed Actions would not affect wetlands. Although Reclamation has not received any specific requests, it is anticipated refuges would request and propose similar actions. The CVP water involved in the proposed actions and alternatives would be applied to existing agricultural lands or M&I facilities and would not affect wetlands. The management of water in the San Joaquin Region includes flood control management especially for the Tulare Lake Basin floodplain. The proposed actions and alternatives provide the flexibility for CVP and non-CVP contractors to jointly manage water in San Joaquin Region enhancing floodplain management.

8.0 LIST OF PREPARERS AND REVIEWERS

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APPENDIX A Non Long-Term CVP Contractors

To help the reader understand **Plate 1** is included depicting the NCVPC contractor's service areas, umbrella agencies and sub-entities. The following is a list of Non-Long-Term CVP Contractors and descriptions:

- Buena Vista Water Storage District
- Cawelo Water District
- Consolidated Irrigation District
- Corcoran Irrigation District
- Deer Creek & Tule River Authority
- Kaweah Delta Water Conservation District
- Kern County Water Agency
- Kern Delta Water District
- Kern Water Bank Authority
- Kings County Water District
- Kings River Conservation District
- Lakeside Irrigation District
- Liberty Water District
- North Kern Water Storage District
- Rosedale-Rio Bravo Water Storage District
- Semitropic Water Storage District
- Tulare Lake Basin Water Storage District

A.1 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 of the District, however the District does not supply any M&I water. The District's water service area contains 48,443 acres of agricultural land. Approximately 45,500 acres of the District 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 entitlement of 21,300 af and surplus entitlement 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 receives CVP water from the FKC out of the Kern River east of Coffee Road. The water is diverted into the City of Bakersfield's Kern River Canal, a lined canal, proceeding west to BVWSD's Alejandro Canal, a lined canal, which proceeds south into the Buena Vista Aquatic Lakes. BVWSD diverts water from the lakes into the District's Outlet Canal which proceeds to the District's intake facilities and to District's canals that serve District landowners.

BVWSD can also receive Friant-Kern water directly into Kern River which proceeds west and can either be diverted from Kern River into the City of Bakersfield's 2800 acre Recharge Facilities or be diverted from Kern River into the Kern County Water Agency Pioneer Project, or proceed west to be diverted either into the District's Alejandro canal for delivery as noted above

or proceed west to be diverted into the West Kern Water District/Buena Vista Water Storage District Project and recharge facilities just west of Interstate 5 Highway.

BVWSD can also receive FKC water for banking in the Rosedale-Rio Bravo Water Storage District. This is done by flowing southerly to the terminus of the FKC. At this point, the water can flow in the Kern River Channel and then flow southwesterly for two (2) miles to Rosedale-Rio Bravo Water Storage District Kern River headworks. The other option is for the water to enter the Arvin Edison bypass into the CVC and then flow southwesterly to the Rosedale-Rio Bravo Water Storage District's CVC turnout No. 2.

BVWSD is geographically located adjacent to the California Aqueduct and low in elevation on the Kern River Fan. The District's Kern River entitlement 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 entitlements 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 the District, 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 the District during a dry year when District supplies are restricted. The second category would be a program where the District 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 the District 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 entitlement 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 District allocated surface deliveries via groundwater pumping from individual wells. During wet years the District 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 the District, 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 US Army Corps of Engineers. BVWSD owns 31.6% of the conservation storage space within the reservoir with flood control being the only overriding purpose. This affords the District a maximum storage increment of 172,000 af of regulation space with a maximum winter carryover capability of 68,800 af. The District also retained storage rights within Cells 1 & @ 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, the District is afforded use of this facility for wet year storage of excess Kern River entitlement. In addition, the District, via agreement with Kern County maintains regulation storage use of 1,800 af of space within Buena Vista Aquatic Recreation Area Lakes. Therefore, the District 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 the District's Kern River water rights since the April-July runoff period does not coincide with the District's 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 the Districts SWP entitlement allow the District to provide a surface water supply for the early pre0-irrigaiton period even though the District's Kern River entitlement normally does not begin until the Mar-August entitlement 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 District with a very useful tool in the operational storage for regulation of both Kern River and SWP flows to the District as well as some valuable surface storage. This facility receives the District's Kern River flow via the Alejandro Canal and SWP flow via turnout BV-3 while directing flows in the District'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 District authorizes the sale of surplus water to reduce or avoid groundwater pumping and generate revenue to offset District operating costs. Generally, surplus water is offered to landowners within the District (for use above surface allocation), to landowners adjacent to the District 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.

The District maintains inflow capability from the Kern River, the KFC and the California Aqueduct. Kern River and FKC flows are delivered via the Kern River channel, the City's Kern River Canal, and the District's Main, Outlet, and Alejandro Canals. California Aqueduct inflow points include BV-1B, BV-2 BV-3, BV-6, and BV-7 which provide adequate capacity to operate at near peak demand. This flexibility allows the District access to large amounts of surplus water from various sources. This District is also able to make isolated deliveries to the northern portion of the service area via California Aqueduct turnout BV-1B that allows for better water management within the perches water area. BVWSD also engages in reclamation, drainage control and irrigation conservation programs.

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

A.2 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 the District.

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 the district'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 the district. 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.

CWD receives CVP surplus water from the FKC by way of the Cross Valley Canal (CVC) and its extension, of which CWD is a 27% owner. The CVP water is pumped from the CVC extension through the District's pump station and conduit "A" and is discharged into the Beardsley/Lerdo Canal and conveyed to pump station "B", for delivery through the District's distribution system where it serves approximately 33,320 watered acres.

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 the district in 1986.

A.3 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. CID is a partner unit under Kings River Conservation District (KRCD) and may participate in the temporary water service actions in this EA under KRCD's auspices, if approved.

CID receives CVP water via the Kings River. Water from the FKC would be released into the Kings River and Consolidated Irrigation District diverts the water approximately 100 yards downstream into the District's system.

A.4 Corcoran Irrigation District

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

A.5 Deer Creek & Tule River Authority

The Deer Creek and Tule River Authority is comprised of six water Contractors as depicted on Plate 1. They are Lower Tule River Irrigation District, Pixley Irrigation District, Porterville Irrigation District, Saucelito Irrigation District, Stone Corral Irrigation District and Terra Bella Irrigation District. All six are Long-Term CVP Contractors and have already undergone environmental analysis.

Within the bounds of the Authority four species of concern have been sighted since 1985. Three specimens of vernal pool fairy shrimp (*Branchinecta lynchi*) were reported from the Stone Corral Ecological Reserve in 1993. One specimen of California jewel flower (*Caulanthus californicus*) was reported from BLM lands in 1991. Three specimens of the tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) were reported in 1985 on private lands. In 1987 there were 8 specimens of blunt-nosed leopard lizard (*Gambelia sila*) reported.

A.6 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 the District, was expanded to include power generation and distribution.

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 the District 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. The District is comprised of four districts that are entirely or partially within KDWCD boundary and are listed below:

Lakeside I.W.D. is discussed elsewhere in this section of the EA.
Kings County W.D. is discussed elsewhere in this section of the EA.
Corcoran I.D.
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 delivered out of the KFC. 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.
St. Johns W.D.
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.
Tulare I.D. is also a CVP contractor and has already undergone environmental review.

District 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 District, 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.

The District 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. The District 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 the District'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 the District are supplied from groundwater.

Terminus Dam and Lake Kaweah, located on the Kaweah River about 3.5 miles to the east of the District, was completed in 1961 by the U.S. Army Corps of Engineers. This project was constructed for flood control purposes on the Kaweah River and to provide river control and water conservation for irrigation purposes. The District 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 the District.

KDWCD can take delivery of CVP water from the FKC, which passes through the eastern portion of the District. The waste way on the FKC at the St. Johns River crossing (FKC Milepost 69.48) and the waste way at the Kaweah River crossing (FKC Milepost 71.29) deliver CVP water into the Kaweah River distributaries' system. Additionally, the turnout for the Tulare Irrigation (FKC Milepost 68.14) serves as a significant point of diversion for CVP water used within the District. All diversion points are in Tulare County.

The District and the Kaweah River groundwater basin have experienced long-term groundwater overdraft estimated in 1972 to be 89,000 acre-feet per year. The District 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 the District 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. KDWCD has no intention of transferring any water for M&I use as a result of this proposed action. Proposals for transferring CVP water for M&I use would require separate NEPA review. While KDWCD owns and operates numerous groundwater recharge basins within its boundaries, it does not provide water banking for others.

A.7 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 the districts peak irrigated acres, 973,000 acres in 1984 and its lowest recent level of irrigated 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. The trend of dwindling permanent 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 entitlement of 1,000,949 acre-feet of SWP water supplies to 21 subcontracting water agencies (“Member Units”) within Kern County listed below:

Table 3

Agency	Surface Water Rights/ Contract Rights	Irrigated Acreage	Percent in Permanent Plantings
*Belridge Water Storage District	SWP	--	--
*Berrenda Mesa WD	SWP	--	--
Buena Vista WSD	SWP, KR	38,411	1%
Cawelo WD**	SWP, KR, MS, Oilfield waste	34,300	97%
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-Castac 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%

* Completely Outside the Friant Division POU. No CVP water would be delivered to these districts. Therefore, no data or further analysis is required.

** Partially outside the Friant Division POU – CVP water can only be delivered inside the applicable POU boundaries.

CVP: Central Valley Project
SWP: State Water Project
KR: Kern River
MS: Minor Streams

The matrix below depicts the SWP supplies for KCWA member units.

Table 4
KCWA Member Unit SWP Entitlements

Member Unit	Entitlement	Allocation (60%)	Water Shortage
Belridge WSD	121,508	72,905	48,603
Berrenda Mesa WD	108,600	65,160	43,480
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
Total	998,730	559,238	339,492

Arvin-Edison WSD, Southern San Joaquin MUD, Shafter-Wasco ID, Delano-Earlimart ID, Kern Tulare WD and Rag Gulch WD are CVP contractors and are not the focus of this EA. Belridge WSD, Berrenda Mesa WD, Tehachapi-Cummings CWD, Tejon-Castac WD and West Kern WD are not within the Place of Use under Reclamation's water rights permits for this action, therefore are not included in 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 for water transfers and exchanges 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 land, such as providing flood control; draining and converting lands; acquire,

appropriate, store, conserve and import water; prevent contamination of water; and develop and sell hydroelectric energy to aid in financing water projects**.**

The KCWA is seeking to be able to deliver CVP water to all areas within Kern County that are within the Places of Use as defined in Reclamation's water rights permits. The primary method of delivery of CVP water supplies to KCWA is via the Kern River at the FKC terminus. The water travels downstream in the Kern River channel, where it is diverted for use by water districts within the place of use as defined in Reclamation's water rights permits or for groundwater recharge projects located along the Kern River fan.

Because of the timing of surplus water availability, the primary use of the CVP surplus water has been for recharge within the Kern Fan groundwater storage projects, including the Berenda Mesa Project, the Pioneer Project and the Kern Water Bank.

KCWA is the largest agricultural water contractor on the SWP and the second largest overall with 1,000,949 acre-feet of annual entitlement. 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.

City	Population
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 have requested a temporary water service contract as an independent contractor and are described elsewhere in this Section.

Henry Miller Water District

Henry Miller Water District is located approximately 17 miles northwest of the southern intersection of Interstate 5 and California Highway 99. The total district acerage as calculated by Reclamation staff using ArcMap is roughly 26,000 acres. Annually the district provides about 35,500 af/y of irrigation water to approximately 19,500 acres of irrigated land.

The district is served by a large network of small private canals from the east. The California Aqueduct traverses the western portion of the district. Lake Webb and Lake Evans are located in the Buena Vista Recreation Area on the eastern side of the district. These two man made lakes are kept full for recreational purposes by the Buena Vista Water storage district as a mitigation measure for the permanent dewatering of the Buena Vista Lake after the construction of Lake Isabella in 1953.

Improvement District No. 4

In the late 1960's KCWA formed 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 the local ground water basin, while 34,000 af is treated at the 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's Improvement District #4 are found 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.

North of the River Municipal Water District

North of the River municipal Water District receives roughly 10,000 af of treated water from the Henry C. Garnett Water Purification Plant on an annual basis. The district is both a retailer of water and a wholesaler of water. In times of drought the district is also able to pump groundwater. The district delivers approximately 7,000 af/y to its contractor, the Oildale Mutual Water Company, the remainder f the districts water is delivered directly to municipal consumers. The primary consumers for North of the River Municipal Water District are residential, with a small portion going to warehouse type businesses. None of the water is used for agriculture.

Oildale Mutual Water Company

Oildale Mutual Water Company was incorporated in 1919 and currently has 6,800 connections providing approximately 7,000 af/y of treated water to a population of approximately 25,000 in Bakersfield.

California Water Service Company

California Water Service Company is a privately held company serving water to consumers in various portions of California. A small service area for California Water Service Company is located near Bakersfield.

East Niles Community Services District

The district has 6,700 connections and serves a population of approximately 27,000. The District's boundaries overlap with Arvin Edison Water Storage District. In addition to

serving municipal and industrial water the District serves approximately 4,600 irrigated acres with 11,000 af/y of water. The District's water resources are KCWA I.D. #4 treated water, groundwater and Arvin-Edison raw water. The main crop is oranges. The district does not have groundwater storage or recharge.

Within the boundaries of the Kern County Water Agency's Improvement District #4 are found San Joaquin woolly threads (*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, California 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 the District through the California Aqueduct which transects the District from West to East. Water from the SWP is the primary source of supplemental water utilized by the District. 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 surplus 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 entitlement 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.

Central Valley Project - 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 Delano-Earlimart Irrigation District, Southern San Joaquin Municipal Water Utility District, Shafter-Wasco Irrigation District, Arvin-Edison Water Storage District, Kern-Tulare Water District, and Rag Gulch Water District.

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 North Kern Water Storage District, Kern Delta Water District, City of Bakersfield, Buena Vista Water Storage District, 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 Agency'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 groundwater 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. The Agency 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 Margrarita 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).

FACILITIES

The following is a description of the conveyance facilities within the KCWA service area. These include the California Aqueduct, Cross Valley Canal, FKC, the Kern Water Bank canal and Kern River. These facilities are briefly described below.

California Aqueduct

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 on 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 - 1[1]; Rosedale Rio-Bravo WSD - 1[2]; Henry Miller WD- 2[3]; 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.

Cross Valley Canal

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

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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.

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.

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.

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.

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.

Friant-Kern Canal

The FKC is operated by the Friant Water Users Authority to convey water supplies from the San Joaquin River through the Friant Division of the Central Valley Project to several districts in Kern County, including the KCWA.

In addition to conveying CVP water, the canal is sometimes used to convey floodwaters from the Kings, Kaweah and Tule rivers which are pumped into the FKC in major flood years. If not pumped into the FKC these waters would flood the Tulare Lake bed. Such floodwaters in the FKC are released into the Kern River channel downstream of Bakersfield where the water can flow into the California Aqueduct via the Kern River - California Aqueduct Intertie or be diverted and recharged into the groundwater basin in Kern County. Alternatively, water from the FKC can be conveyed to the California Aqueduct or recharge areas via the CVC operating in reverse mode.

Kern Water Bank Canal

The Kern Water Bank (KWB) 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 California 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 California Aqueduct, either directly or by exchange, to districts for a supplemental water supply.

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, North Kern 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 NCVPC 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 NCVPC 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 Kern NCVPC 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 either CVP Contractors or NCVPC, 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 Kern 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 can not 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 transfers or exchanges to refuges and separate NEPA analysis would be required.

Potential Exchange Functions
Exchanges involving CVP supplies have occurred and may occur for the following reasons.

1. Exchanges to access surface storage – There are times when surface reservoirs (i.e. Lake Isabella) accessible to Kern NCVPC interests are at varying levels of fullness. Water availability on the Kern River or minor streams may not match up with the ability of the surface storage on that system to regulate the supply in order to match demand patterns. Exchanges can be used to affect the storage of CVP water in a non-CVP reservoir and vice versa. There may also be monetary or water resource gains associated with facilitating such exchanges.

2. Exchanges to access groundwater storage – “In lieu” groundwater recharge can be facilitated with exchanges that deliver CVP surface water to lands that would otherwise be pumping groundwater. Similarly, CVP deliveries may be made into river reaches to offset river losses effecting “in lieu” groundwater recharge elsewhere by virtue of making the displaced surface water (otherwise charged as river loss) available to these areas.

Another common method of exchange to access groundwater storage involves use of the large-scale groundwater recharge and recovery facilities located on the Kern River fan and in Semitropic Water Storage District (also in Arvin Edison Water Storage District, a Friant long-term contractor). Friant-Kern or CVP Delta water may be available to a CVP

Contractors, but not sufficiently regulated to match demand patterns. The water may be recharged on the Kern Fan recharge and recovery facilities or within Semitropic when it is available (typically in the winter months) and a like amount of groundwater recovered and delivered to the long-term contractor during times that better match demand patterns. There may also be monetary or water resource gains associated with facilitating such exchanges. KCWA collects fees for storing water for contractors until such time it is needed in the growing season.

3. Exchanges to allow delivery of non-CVP water to CVP districts – Lands capable of being served with both CVP and non-CVP surface water supplies can facilitate an exchange of water so as to effect the movement of the non-CVP supply through CVP facilities without actually having to physically transport the non-CVP supply through the CVP facilities.

4. Exchanges to allow delivery of CVP water to non long-term CVP districts – Similar to 3. above, lands capable of being served with both CVP and non-CVP supplies can facilitate an exchange of water so as to effect the movement of CVP supplies through non-CVP facilities without actually having to physically transport the CVP supplies through the non-CVP facilities.

A.8 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 the district's 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.

The district 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 the district 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. KDWD is completely within the Friant Places of Use. 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.

KDWD has historically received CVP surplus water either by direct contract with Reclamation, through participation with the KCWA, or by exchange with Arvin-Edison WSD. Regardless of the contract method, KDWD receives CVP water through a direct connection with Arvin-Edison WSD. KDWD has the capability of taking CVP water from the Arvin-Edison Intake Canal running mostly west to east across the northern portion of KDWD and crossing several of KDWD's canals. KDWD has the capability of taking water from the Arvin-Edison Intake Canal into the Stine and Farmers service areas through the Stine Canal and the Kern Island service area through the Kern Island Canal. The Buena Vista service area can also receive CVP water by moving water from the Arvin-Edison Intake Canal to the Kern River Canal then to the Buena Vista Canal. KDWD does not require special exchanges to take delivery of CVP water.

A.9 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 ownership of 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 district do use the water for farming within their districts.

The majority of KWBA land, 17,000 of the 20,000 acres that comprise the agency, 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.

A.10 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 the District. The total area of KCWD is 143,000 acres, of which 51,150 acres are also with 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. The District population excluding City of Hanford is 25,000. Although, KCWD boundaries encompass the Cities of Hanford and a portion of Lemoore, the District does not supply any M&I water. There is 775.8 acres of native lands.

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 the District. 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 the District'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 District. The 1996 map indicated that approximately 25 percent of the District area is semi-agricultural or non-agricultural. According to the District, 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. The District 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.

KCWD receives FKC water when it is diverted from FKC into the Kings River by an existing diversion structure. Water is diverted from the Kings River at People's Weir, just west of Highway 99. Water is diverted into the People's Ditch Company's main canal, of which KCWD is a stockholder. From the main canal KCWD can divert water into several ditches within their boundaries to be delivered to the landowners.

A.11 Lakeside Irrigation Water District

Lakeside Irrigation Water District (LIWD) is located east of the city of Hanford and the northern portion of the District crosses Hwy 198. LIWD 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. LWID 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 the Districts 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.

LWID 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 in the district was planted in various tree crops, grasses, vegetables and sugar beets.

LIWD receives CVP water from the FKC via the Kings River and Lakelands Canal or through the St. Johns River and Cross Creek to the headgate of the LIWD distribution system.

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

A.12 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. The District 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 for the District. 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 the District.

LWD has consistently entered into short-term and temporary water service contracts with Reclamation for the purchase of surplus CVP water. LWD has also acquired CVP water through transfers from long-term CVP contractors, as available. LWD could receive CVP water through the FKC via the Kings River where the water is diverted into the Liberty Canal and distributed within the district.

A.13 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 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 district 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% of the District uphill of the FKC. There is a turnout on the North side of Poso Creek on the FKC. NKWSD has a weir across Poso Creek on the Calloway Canal approximately 1-1/2 miles below the FKC. In addition, NKWSD 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.

A.14 Rosedale-Rio Bravo Water Storage District

Rosedale-Rio Bravo Water Storage District (R-RBWSD) is located west of Bakersfield in Kern County. The District 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. The District is primarily planted to alfalfa hay, almonds, grain, cotton and corn. All water coming into the District has been for groundwater recharge and overdraft correction. R-RBWSD does not serve M&I water.

Water used within the District 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 District's groundwater recharge project. Prior to operation of the District's 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 District 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.

The District has completed construction of additional recharge basins and now has a wetted area of approximately 840 acres available for groundwater recharge. The District is also a recharge participant in the Pioneer Project, and as such, has first priority to 25% of the total recharge capacity. This provides the District an additional 50 cfs of recharge capacity.

The District 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 the District with an average (firm and surplus) of about 29,900 af/y. However, the District is now expected to receive only about 76% of its firm entitlement or about 22,700 af/y. The District has also been unable to renew its short-term contract with Reclamation and is now only able to obtain surplus CVP water or through transfers. Currently, there are no export facilities in the District.

The CVP surplus water makes its way into the R-RBWSD by flowing southerly to the terminus of the FKC. At this point, the water can flow into the Kern River Channel and then flow southwesterly for two miles to R-RBWSD Kern River headworks. The other option is for the water to enter the Arvin-Edison bypass into the CVC and then flow southwesterly to the R-RBWSD's CVC turnout #2.

A.15 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, SWDS 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 entitlement 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 entitlement to buy into Kern Water Bank (KWB) and now has 155,000 acre-feet annual firm entitlement 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 the District 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 and alternatives could result in providing CVP water to SWSD for the purpose of groundwater recharge or conjunctive use.

SWSD has three ways of recovering water from the FKC. (1) Via Poso Creek through a FKC discharge structure into the creek. It is conveyed to the District's permitted diversion structure and delivered to irrigated lands and duck clubs in the surface water area of the District. (2) Via interconnection facilities with Shafter-Wasco Irrigation District which conveys water from the FKC by pipeline directly into our canal system. Water is then conveyed to irrigated lands. (3) Via spreading facilities located on the Kern Fan. SWSD is part owner of the Pioneer Project and the Kern Water Bank, both of which are located on the Kern River Fan area. Water from the CVP has historically been delivered to these projects for storage purposes from the end of the FKC where it spills into the Kern River. It is then diverted from the river into these two projects.

A.16 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 the District 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 the District's state contract, the Tulare Lake Bed units rely most heavily on Kings River water for irrigation purposes.

CVP water is conveyed to the District via the California Aqueduct or released into the Kings River, Kaweah River or Tule River from the FKC. Subsequent exchanges would likely be conveyed from the Kings River and Tule River systems by gravity. No other exchanges are contemplated. While the District has no formal water banking facilities, it does practice conjunctive use.

Tulare Lake Basin Water Storage District (TLBWSD) has requested a Temporary Water Service Contract as a separate contractor. TLBWSD has a service area of 185,800 agricultural acres. 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.

For informational purposes, Angiola Water District and Melga Water District are located within, and share facilities with, TLBWSD. However, Angiola and Melga Water Districts are separate entities and the associated lands are not serviced by TLBWSD. Therefore, Angiola and Melga Water Districts are not part of this analysis and approval action.

A.17 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. KRCD was established in the fall of 1951. 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.

KRCD's mission is to provide flood protection, achieve a balanced and high quality water supply, and develop power resources within its boundaries.

KCRD is a public agency that coordinates common interests on the Kings River. KRCD does not collect membership dues from partner units. The 35 partner units are listed and described below:

Alta Irrigation District
Clark's Fork Reclamation District No. 2069
Consolidated Irrigation District
Corcoran Irrigation District
Empire West Side Irrigation District
Fresno Irrigation District
James Irrigation District
Kings County Water District
Kings River Water District
Laguna Irrigation District
Lakeside Irrigation Water District
Tulare Lake Basin Water Storage District
Tulare Lake Reclamation District No. 761

Burrel Ditch Company
Corcoran Irrigation Company
Crescent Canal Company
John Heinlen Mutual Water Company
Last Chance Water Ditch Company
Lemoore Canal and Irrigation Company
Liberty Canal Company
Liberty Mill Race Company
Lovelace Water Corporation

Liberty Water District
Mid-Valley Water District
Raisin City Water District
Riverdale Irrigation District
Salyer Water District
Stratford Irrigation District
Tranquility Irrigation District
Peoples Ditch Company
Reed Ditch Company
Southeast Lake Water Company
Stinson Canal and Irrigation Company
Tulare Lake Canal Company
Upper San Jose Water Company

KRCD partner units are described below:

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 distribution system. Diversions are all by pumping through 30 individual pumping facilities along the Clark's Fork and South Fork channels. The District has a 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

CID is described elsewhere in this Section as an independent entity. CID has been determined to require separate environmental review for temporary water service contracts or transactions with the CVP Contractors involving CVP water.

Corcoran Irrigation District

Corcoran Irrigation District (CoID) is described earlier in this Section

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. The District also is a SWP contractor with deliveries made through TLBWSD Lateral A, which leaves the California Aqueduct at Kettleman City. The 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. The District 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 entitlement under the complex Kings River water diversion schedules is the largest in KRCD. Surface water transported by the District 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. The District stretches from the base of the Sierra foothills to west and south of Kerman. The District's internal water distribution system is extensive and complex. The District provides water (through the Fresno entitlement) to the Freewater County Water District north of Sanger

The District's territory encompasses much of the northern valley floor portion of Fresno County and embraces the cities of Fresno and Clovis. Other communities within the District service area include Kerman and Biola. The District'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. The District's mission is to deliver agricultural water and has a service area of 25,800 irrigated acres.

Since 1963, the District's primary surface water supply (under water exchange agreements with both JID and Tranquillity Irrigation Districts (TID) and the lower Kings River units) has been CVP water pumped from the Mendota Pool. The District diverts Kings River water only when flood release flows are available. Water enters the District 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 an entitlement). No water leaves the District.

JID and TID 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 TID are also CVP Contractors. The two Districts leased their average annual Kings River entitlement to other lower Kings River units at a price equal to that paid by JID and TID 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 TID entitlement 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 Tranquillity 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. The District's senior water rights and small delivery system capacity combine to enable the District to deliver water much of the year. The District's service area is 25,800 acres of which 10,000 acres are irrigated agriculture. The District does not provide M&I water. Water enters the District by diversions from the Kings River. No water leaves the District.

Laguna Irrigation District

Laguna Irrigation District (LID) 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. The District's 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 entitlements 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 entitlement schedules. This ultimately led to later agreements that resolved all Kings River water rights and entitlement issues. The District has a total area of 35,000 acres of which 20,700 are agricultural. The District 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. The 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. The District 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. The District's Kings River entitlement is combined with the Reed Ditch Company and Liberty Mill Race Company under the Murphy Slough Association. The District'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 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. The District serves the Stratford area of Kings County. The District 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 (TID) is a CVP Contractor and has already undergone extensive environmental review and is not the focus of this EA. TID has a service area of 10,700 agricultural acres and is a CVP Long-Term contractor. The District is the northwesterly unit in KRCD. The District's surface water supply (under the Tranquillity exchange agreement) is pumped from the Mendota Pool. The District'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 (TLBWSD) has requested a Temporary Water Service Contract as a separate contractor. The District is described earlier in this section

Tulare Lake Reclamation District 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. The District delivers water to lands on the western and southwestern sides of the Tulare Lake Bed in Kings County. The District has a service area of 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 Wier, 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 entitlements. 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 make 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).

Facilities for Delivery of CVP Water

Friant CVP water can enter directly in the District from the FKC through turnouts into FID and through waste ways located at the Kings River, St. Johns River, Kaweah River and Tule River.

Water originating in the FKC and diverted into FID or the Kings River will have the potential to flow throughout most of the District.

Water originating in the FKC and diverted at points south of the Kings River will be limited to flowing to only the southern half of the District.

Potential Sources of Exchange Water

KRCD acting in concert with or on behalf of agencies or entities within its boundaries has access to five potential sources of water that could be exchanged for CVP water supplies (Friant Division or Cross Valley Division supplies):

1. Kings River waters and streams tributary to the Kings River (i.e. Mill Creek);
2. Sand Creek, Wahtoke Creek and other minor streams flowing into KRCD;
3. Kaweah, St. Johns, Tule River water – Exchanges utilizing CVP water can potentially be used to facilitate delivery of water from these other river systems;
4. SWP water and;
5. Groundwater.

Kings River water is available to the lands served by the KRCD by diversion from the Kings River at numerous established points of diversion along the river and subsequently from various canals and pipelines owned and operated by public water agencies and private water companies.

Local minor stream transect a number of the districts within KRCD with established diversion points where many of these streams cross District distribution systems. Entities within KRCD own water rights on some of the Tule and Kaweah / St. Johns River systems. The FKC also traverses these drainages providing the potential for exchanges that could allow KRCD interests access to these other water supplies. Other river systems tributary to lands within Friant Division of the CVP may also provide future opportunities for exchanges involving CVP water.

SWP water supplies are accessed from turnouts along the California Aqueduct and subsequently from public and privately owned canals and pipelines that transport the water for use within the KRCD.

Exchanges involving groundwater could occur virtually anywhere within the KRCD that has access directly or through additional exchange to CVP surface water supplies.

Potential Exchange Functions

Exchanges involving CVP supplies have occurred or may occur for the following reasons:

1. Exchanges to access surface storage – There are times when surface reservoirs accessible to KRCD interests are at varying levels of fullness. Water availability on a particular river may not match up with the ability of the surface storage on that river system to control or regulate the supply in order to match demands. Exchanges can be used to affect the storage of CVP water in a non-CVP reservoir and visa versa. There may also be monetary or water resource gains associated with facilitating such exchanges.

2. Exchanges to access groundwater storage – "In lieu" groundwater recharge can be facilitated with exchanges that deliver CVP surface water to lands that would otherwise be pumping groundwater. Similarly, CVP deliveries into river reaches to offset river losses effecting "in lieu" groundwater recharge elsewhere by virtue of making the displaced surface water (otherwise charged as river loss) available to these other areas.

3. Exchanges to allow delivery of non-CVP water to CVP districts – Lands capable of being served with both CVP and non-CVP surface water supplies can facilitate an exchange of water so as to effect the movement of the non-CVP supply through CVP facilities without actually having to physically transport the non-CVP supply through the CVP facilities.

4. Exchanges to allow delivery of CVP water to non long-term CVP districts – Similar to 3. above, lands capable of being served with both CVP and non-CVP supplies can facilitate an exchange of water so as to effect the movement of CVP supplies through non-CVP facilities without actually having to physically transport the CVP supplies through the non-CVP facilities.

APPENDIX B

PHYSICAL FEATURES ON THE KINGS RIVER

This section describes the physical features on the Kings River to help the reader associate where the points of diversions and how these facilities supply water to KRCD and its subentities.

Mill and Hughes Creeks

These important tributaries enter the Kings Riverbetween one and three miles below Pine Flat Dam. The watermaster apportions the creek's flows based on the river's water schedule. Some Kings River units accept their shares of water from Mill and Hughes Creek to help recharge the San Joaquin Valley's groundwater reservoir.

Cobbles Weir

Cobbles Weir is the river's first diversion structure. At the weir, water can be directed through Cobbles Gate into the '76 Channel (off the river's left bank) which is operated by the *Alta Irrigation District*. The channel conveys water four miles to the Alta headgate at Frankwood Avenue near Minkler, the *Alta Irrigation District's* actual point of diversion. When the Alta system is not operating, flows are usually not permitted in the '76 Channel.

Dennis Cut and Byrd Slough

Water conveyed in Dennis Cut, a small channel which leaves the main river near Avocado Lake, also reaches the Alta headgate. It serves various points of diversion within the *Kings River Water District*, including water released on a year-round basis back toward the river through the Alta Wasteway (just upstream from the Alta headgate) and Byrd Slough through the Centerville Bottoms.

Fresno Weir

Three miles northeast of Centerville, a low-profile structure known as Fresno Weir pools water for diversions off the river's right bank in the *FID* Fresno Canal and through the *Consolidated Irrigation District's* headgate. The Consolidated Canal, with a capacity of 2,000 cfs is the river's largest single point of diversion.

Immediately upstream, the FKC crosses under the Kings River through a 3,200-foot siphon as it delivers San Joaquin River water along the San Joaquin Valley's east side. A control structure and channel permit Friant water to be delivered at Fresno Weir to the CVP's only long-term Kings River service area contractors, the *FID* and City of Fresno, or any temporary Kings River service area users of Friant water.

Centerville Bottoms

Located east and northeast of Sanger, this rich and beautiful delta contains many wooded areas and complex, secluded sloughs which, supplied by the river, ultimately flow back into the main stream. The area is served by the *KRWD* many small channels which utilize 16 diversion points. At the lower end of the Centerville Bottoms are the Reedley Narrows (near the Adams Avenue alignment), a reach in which the river is constrained by

bluffs. There are no KRCD points of diversions from above Reedley Narrows to State Route 99 near Kingsburg.

People's Weir and Pool
Largest of all such Kings River structures, People's Weir spans the channel a mile south of the Fresno County community of Kingsburg just inside the north-eastern corner of Kings County. Created is 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 operated canals deliver water to users in a substantial portion of eastern Kings County, all the way to the Tulare Lake Bed. The pool extends about three miles upstream to just above the Avenue 400 (State Route 201) bridge.

Old River
The original Kings River channel makes an abrupt turn toward the south a few hundred feet below People's Weir. In 1867, what is believed to have been the greatest river flood since settlement of the region began, deepened an entirely new channel that had been carved during an 1861 flood. The river itself eventually caused a natural plug to form across the original channel, now known as the Old River. Except at times of exceptionally high flows, it has since remained dry. Under a 1967 water rights decision, an Old River headgate was constructed on the People's Canal two miles south of People's Weir. The old channel, now operated by *KCWD*, receives water for groundwater recharge purposes in good water years.

Last Chance Weir
On the main Kings River's left bank near Laton, Last Chance Weir pools water for diversions into the *Last Chance Water Ditch Company's* canal which serves portions of kings County.

Reynolds Weir
Spanning Cole Slough on the eastern edge of Laton, Reynolds Weir controls diversions into the *LID* Grant Canal and A Canal, as well as, Murphy Slough and Liberty Canal which supply the *RID, Reed Ditch Company* and *Liberty Mill Race Company* (all of which are members of the Murphy Slough Association), the *Burrel Ditch Company* and *Liberty Canal Company*.

Lemoore Weir
Three miles downstream from Laton is Lemoore Weir where the *Lemoore Canal and Irrigation Company* makes its diversion to serve much of the Lemoore area in Kings County. The Lemoore headgate is also the primary point of diversion for the *John Heinlen Mutual Water Company* which serves a smaller area north and northwest of Lemoore.

Army Weir
The Kings River is unique that in its lower reaches it divides. The southerly channel is known in different stretches as Clark's Fork and the South Fork. It flows southeasterly and southerly into the Tulare Lake Bed region. Army Weir, constructed and maintained

by the Army Corps of Engineers for flood purposes, regulated flows into the Clark's Fork and South Fork system. Below State Route 41 are 30 individual pumping facilities which serve users in *Clark's Fork Reclamation District No. 2069*. A small channel along the district's southern boundary is the river's South Fork. One-half mile south of the Hanford-Armona Road, The South Fork and Clark's Fork combine as the South Fork.

Empire Weir No. 1
Located west of Lemoore, Empire Weir No. 1 forms a large pool for diversions into the Stratford, Westlake and Empire Westside canals.

Empire Weir No. 2
A mile southwest of Stratford, 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. One of two *TLBWSD* laterals from the California Aqueduct makes SWP project deliveries immediately below the weir. Lateral A also makes SWP deliveries to the *Empire West Side Irrigation District* and Kings County. The *Stratford Irrigation District's* Crabtree Ditch begins at Empire Weir No. 2, which marks the South Fork terminus of KRCD channel and levee maintenance.

Island Weir
The North Fork is controlled by Island Weir, a few hundred feet from Army Weir. Along with making irrigation deliveries, the North Fork serves as the primary means of disposing of Pine Flat Dam flood releases. Under typical high flow operations, the first 4,750 cfs of flood release water is directed through the North Fork-Fresno Slough-James Bypass channel to the San Joaquin River.

Crescent Weir
A few miles southwest of Riverdale and four miles below State Route 41 is Crescent Weir where North Fork flood release quantities are typically measured and confirmed. Beginning here are the *Crescent Canal Company's* ditch and *Laguna Irrigation District's* Summit Lake Ditch. The North Fork's channel below Crescent Weir becomes known as Fresno Slough.

Stinson Weir

Three and a half miles northwest of Lanare on Fresno Slough is Stinson Weir, point of diversion for the *Stinson Canal and Irrigation Company's* canal. Under normal operating conditions, Stinson Weir is the last point of diversion on the North Fork (although other historic points of diversion still exist downstream).

During the winter months, farmers use water for frost control and to pre-irrigate fields to saturate the top five feet of soil prior to planting. This technique loosens the soil for plowing and provides enough moisture to the seeds for successful germination. The application of this water over the surface will percolate into the ground and incidentally result in a slight benefit to overdraft conditions. The proposed action will also streamline the administration for continuation of groundwater recharge that will maintain benefits derived from historical uses.