BROADVIEW WATER CONTRACT ASSIGNMENT PROJECT

Environmental Assessment/ Finding of No Significant Impact

April 2004

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202529

FINDING OF NO SIGNIFICANT IMPACT

United States Department of the Interior

Bureau of Reclamation

Mid-Pacific Region

FINDING OF NO SIGNIFICANT IMPACT

BROADVIEW WATER CONTRACT ASSIGNMENT PROJECT

Recommended: _____

Concur: _____
Regional Environmental Officer

Approved: _____
Regional Director

Date: _____ **FONSI No.** _____

In accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, the Mid-Pacific Regional Office of the U.S. Bureau of Reclamation (Reclamation) has determined that an environmental impact statement is not required for the Broadview Water Contract Assignment Project.

The Pajaro Valley Water Management Agency (PVWMA) is responsible for protecting and managing the water resources of the Pajaro Valley. The Pajaro Valley historically has relied primarily upon groundwater to meet agricultural, municipal, and industrial water demands within the PVWMA service area. Groundwater pumping has led to overdraft conditions, causing seawater intrusion from the Pacific Ocean through the aquifer toward areas of depressed groundwater levels. Seawater intrusion in the Pajaro Basin was first identified in 1953 by the State Water Resources Board (now the Department of Water Resources or DWR). Reclamation completed a feasibility study in 1964 for the San Felipe Division of the Central Valley Project (CVP) that confirmed seawater intrusion along the coastal areas of Monterey Bay. Seawater intrusion into the groundwater in the coastal areas of the basin degrades the water quality, affecting the groundwater's suitability for drinking water and irrigation of crops.

PVWMA is in escrow to purchase, on a willing-seller/willing buyer basis, approximately 9,100 acres of lands within the Broadview Water District (BWD). BWD was formed in 1955 to provide irrigation service to a group of landowners who de-annexed from the Westlands Water District (Westlands). Within BWD's approximately 9,515 acre service territory, approximately 9,200 acres are irrigated for agricultural production. 9,100 acres are owned by 30 private landowners and BWD owns approximately 100 acres. In 1959, BWD entered into a long-term contract (Contract 14-006-200-8092) with the Reclamation for 16,000 afy of CVP water. In May 1964, after the capacity of BWD's distribution system was increased, the 1959 contract was amended. The new contract (Contract 14-06-200-8092 Amendatory) is now for 27,000 afy of CVP water. The amended contract expired on February 28, 1995. Since then, a series of interim contracts have been executed, while the parties negotiate a long-term renewal contract.

At present, 30 individual landowners within BWD, representing nearly all of the privately-owned land within BWD, have agreed to sell their land and associated water allocations to PVWMA. The sole purpose of purchasing these lands is for PVWMA to take possession of the BWD's CVP water service contract associated with these lands and to have it permanently assigned to PVWMA. The Proposed Action or assignment of BWD's CVP water service contract to PVWMA will provide PVWMA with the ability to meet its water management needs in the PVWMA service area by balancing existing and projected basin water demand and supply thereby alleviating seawater intrusion. The purchase of the lands is a discretionary action by PVWMA only and therefore is only subject to California Environmental Quality Act (CEQA). As there are no federal approvals for the purchase of these lands by PVWMA, there is no federal action and therefore the land purchase activities are not subject to NEPA and are not the focus of this NEPA document.

An Environmental Assessment has been prepared that fully discloses any potential environmental impacts associated with the Proposed Action in accordance with NEPA. Detailed below are

PVWMA-sponsored measures that will ensure that Proposed Action would not result in significant impacts:

- All fallowed lands will be managed for weed and pest control by discing the fields twice a year, coinciding with the existing planting and harvesting agricultural practices.

- Appropriate air quality and dust control measures will be taken to minimize fugitive dust and emissions generated as a result of any earth-moving activities associated with the weed and pest control activities. Specifically, these include, but are not limited to:

  I. Ensuring that all earth-moving activities and application of any dust control products meet local, regional, state, and federal air quality control regulations; halt all earth moving activities during periods of sustained strong winds (hourly average wind speeds of 20 mph or greater); and

  II. Properly maintain all earth moving vehicles and avoid excessive idling of inactive equipment.

- No expansion of any drain water or shallow groundwater application for growing salt tolerant crops or any other unidentified land management strategies will be undertaken without additional and appropriate environmental documentation.

- PVWMA, acting as BWD, will continue to work cooperatively and continue to participate in the programs led by the Grassland Area Farmers for the implementation of projects to reduce water quality impacts to the wildlife habitat areas and the San Joaquin River. It is recognized that this will be based on the proportion of water quantity and quality impacts caused directly or indirectly by discharges from BWD.

- PVWMA, acting as BWD, will leave water within BWD or make water available to mitigate for identified adverse impacts to sensitive, threatened, or endangered species as a result of the implementation of the Proposed Action Alternative as identified by the U.S. Fish and Wildlife Service or the National Oceanic and Atmospheric Fisheries Service (NOAA Fisheries; formerly known as the National Marine Fisheries Service) through this environmental review process. As discussed in Chapter 4.0, no significant adverse impacts have been identified that would necessitate leaving CVP water at BWD for environmental purposes.

- The approximately 23 acre-feet of water per year that is currently delivered by Westlands and is used as potable water within BWD will remain unchanged.

- PVWMA, as landowner within BWD, will continue to pay property taxes and land-based assessments levied on the properties.

- PVWMA, acting as BWD, will make every attempt to employ contract workers working in the BWD to maintain the fallowed lands as described above and other District operations as appropriate.

- If PVWMA elects to sell or transfer the lands within BWD, the successor(s) in interest will be required to follow these terms and commitments, applicable mitigation measures, and all federal, state and local laws. Any proposed change in land use other than what is prescribed in this Proposed Action would require additional environmental documentation, review and approvals under NEPA and CEQA.

Measures prescribed in this section are not actions proposed by Reclamation and therefore do not constitute front-end loading. Rather, these measures were developed by PVWMA and will be exclusively implemented by PVWMA

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CHAPTER 1.0
PURPOSE AND NEED

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PURPOSE AND NEED

1.1 INTRODUCTION

This Environmental Assessment (EA) addresses the potential environmental impacts associated with the proposed assignment of the Broadview Water District's (BWD) Central Valley Project (CVP) water service contract to the Pajaro Valley Water Management Agency (PVWMA). The proposed assignment is known as the Proposed Action.

This document has been prepared in accordance with the National Environmental Policy Act (NEPA). The U.S. Bureau of Reclamation (USBR or Reclamation) is the federal agency responsible for approving the assignment of the CVP water service contract and is, therefore, the lead agency responsible for complying with the provisions of NEPA. PVWMA will function as the lead agency responsible for complying with the California Environmental Quality Act (CEQA). Due to the separate approval actions and authorities, Reclamation has requested that PVWMA comply with CEQA separately from NEPA. As a result, PVWMA is complying with CEQA in a separate document and through a separate process[1], which satisfies a contractual agreement between the landowners and PVWMA.

1.2 BACKGROUND OF THE PROPOSED ACTION

PVWMA is in escrow to purchase, on a willing-seller/willing-buyer basis, approximately 9,100 acres of lands within the BWD. At present, 30 individual landowners within BWD, representing nearly all of the privately-owned land within BWD, have agreed to sell their land and associated CVP water allocations to PVWMA. The sole purpose of purchasing these lands is for PVWMA to take assignment of the BWD's CVP water service contract associated with these lands. Assignment of BWD's CVP water service contract to PVWMA will provide PVWMA with the ability to meet its water management needs in the PVWMA service area by bringing existing and projected basin water demand and supply into balance and alleviate seawater intrusion. The purchase of the lands is a discretionary action by PVWMA only and therefore is only subject to CEQA. As there are no federal approvals for the purchase of these lands by PVWMA, there is no federal action and therefore the land purchase activities are not subject to NEPA and are not the focus of this EA.

[1] PVWMA submitted a Draft Environmental Impact Report (EIR) for the Project on January 16, 2004.

1.2.1 PVWMA WATER SUPPLY NEEDS

The Pajaro Valley groundwater basin has historically been and still remains in a state of overdraft. In 1984, PVWMA was formed and given the responsibility of managing ground and surface water resources within the Pajaro Valley. As part of the alternatives screening process during the development of its Revised Basin Management Plan (BMP), PVWMA determined that even with strict conservation, water recycling, and groundwater management strategies; an import water supply was necessary to meet current and future agricultural water demands and alleviate seawater intrusion[2]. PVWMA has worked with Reclamation to complete a water needs assessment consistent with Reclamation policies and procedures. PVWMA's water needs assessment, as approved by Reclamation, shows that in the year 2030, PVWMA has a need for the entire 27,000 acre-feet per year (afy) of CVP contract supply potentially available from the assignment of the Broadview Water District CVP contract. Furthermore, Reclamation has determined that PVWMA has the ability to put all 27,000 afy to beneficial use once assigned BWD's CVP water contract.

1.2.2 STUDY AREA

The Proposed Action study area is located within the existing water service boundary of BWD, located in western Fresno County near the City of Firebaugh. **Figure 1-1** illustrates the regional location of BWD relative to PVWMA, which is centered in Watsonville, California and has jurisdiction in areas covering portions of Santa Cruz, Monterey, and San Benito Counties. **Figure 1-1** also illustrates BWD's and PVWMA's respective boundaries, relative to regional transportation and surface water features. The boundaries of BWD roughly correspond to portions of the "Broadview Farms, CA" and the "Firebaugh, CA" U.S. Geological Survey (USGS) 7.5' Quadrangles.

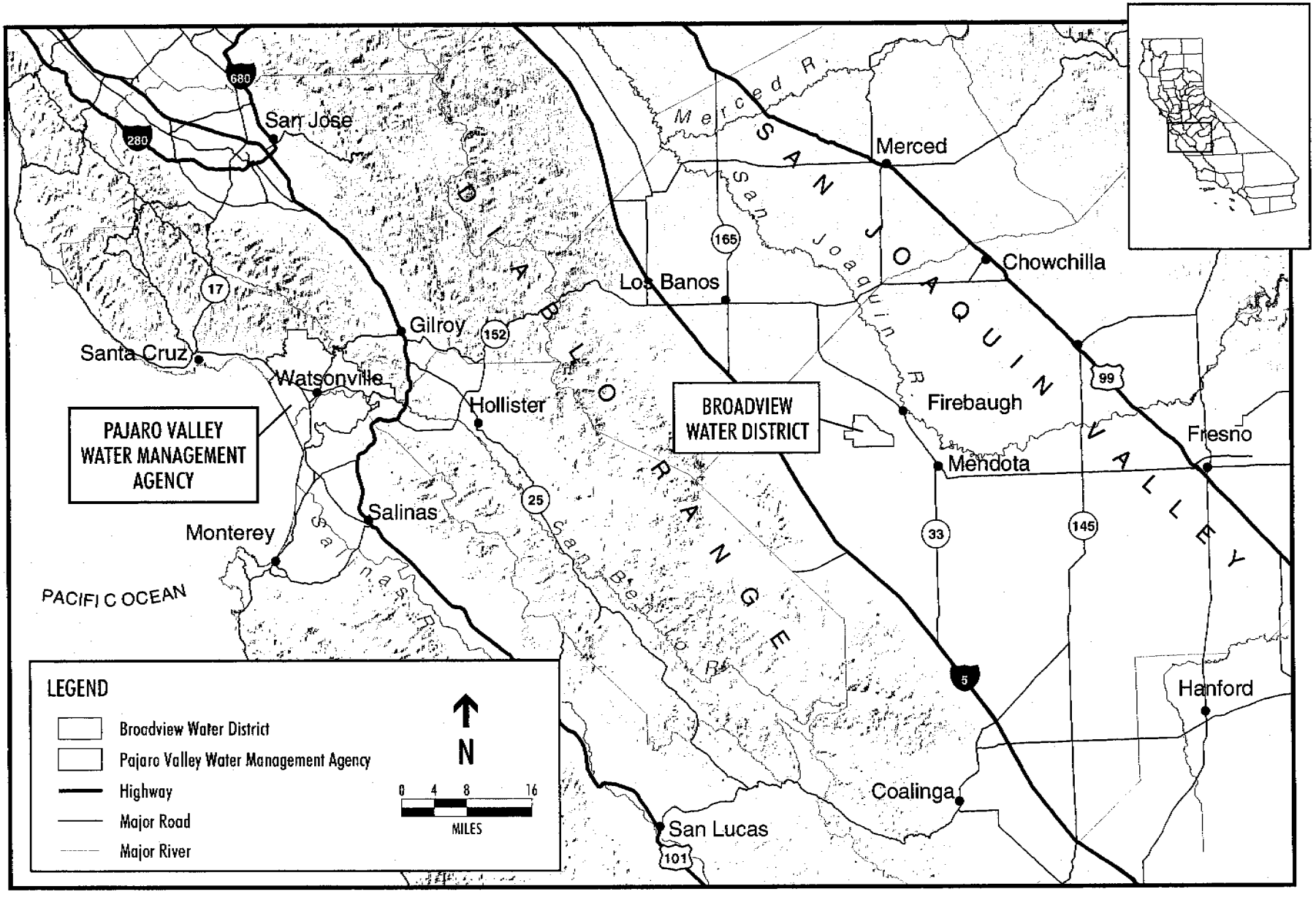
1.3 RELATED ENVIRONMENTAL DOCUMENTATION

Detailed below are the related environmental documents that have been incorporated by reference in this Environmental Assessment (EA).

1.3.1 PVWMA REVISED BASIN MANAGEMENT PLAN EIR AND EIS

In 2002, PVWMA's Board of Directors approved a Revised BMP to manage water supplies and eliminate seawater intrusion into the groundwater basin. This was an update to the 1993 Basin Management Plan. The 1993 BMP's Recommended Alternative included managing groundwater pumping to sustainable yield, water conservation, development of local supplies and the

[2] Seawater intrusion in the Pajaro Basin was first identified in 1953 by the Department of Water Resources (DWR). Reclamation completed a feasibility study in 1964 for the San Felipe Division of the CVP that confirmed seawater intrusion along the coastal areas of Monterey Bay. Seawater intrusion into the groundwater in the coastal areas of the basin degrades the water quality, affecting the groundwater's suitability for drinking water and irrigation of crops.



SOURCE: California Data Exchange, 2002; and Environmental Science Associates. 2003

Figure 1-1
Regional Map

importation of water to bring existing and projected basin water demand and supply into balance and alleviate seawater intrusion.

Impacts of the use of imported water in the Pajaro Valley were evaluated in a Project EIR. The Revised Basin Management Plan EIR was certified by PVWMA's Board of Directors in February, 2002. In addition, the Revised Basin Management Plan EIR also contains the analysis required by the State Water Resources Control Board (SWRCB) for the change in place of use for CVP water pursuant to the requirements of CEQA. A separate Final Environmental Impact Statement (EIS) on the Revised Basin Management Plan is now being prepared pursuant to NEPA which provides an evaluation of potentially available water supplies, including CVP supplies, that could be imported to the Pajaro Valley and project-level evaluations of the Import Pipeline Project, which will connect to the federal CVP system and Title XVI funding for the Watsonville Area Water Recycling Project. This EIS has been out for public review and the Record of Decision is anticipated to be signed in May 2004. This Record of Decision would need to be in place prior to the construction of the Import Pipeline and/or approval of the assignment of BWD's water supply contract to PVWMA.

1.3.2 LOCAL WATER SUPPLY AND DISTRIBUTION EIR (LOCAL PROJECTS EIR)

PVWMA prepared and certified the Local Projects EIR in compliance with CEQA, which evaluated the impacts associated with the development of various local surface water supplies within the Pajaro Valley Basin, including surface water diversions and groundwater recharge.

1.3.3 CVP WATER CONTRACT ASSIGNMENT FROM MERCY SPRINGS WATER DISTRICT (CONTRACT NO. 14-06-200-3365A) TO PAJARO VALLEY WATER MANAGEMENT AGENCY EA/FONSI.

The Environmental Assessment/Finding of No Significant Impact (EA/FONSI) for the CVP Water Supply Contract Assignment from Mercy Springs Water District to PVWMA was approved by Reclamation on May 14, 1999. The Proposed Action evaluated in this document was the assignment of a portion of the Mercy Springs' Water District's (MSWD's) CVP contract to PVWMA. The EA/FONSI did not evaluate the use of the water obtained from MSWD in the Pajaro Valley, which was evaluated in the Revised Basin Management Plan EIR and EIS.

1.3.4 BROADVIEW WATER CONTRACT ASSIGNMENT PROJECT EIR

PVWMA prepared an EIR for the Proposed Action and circulated the Draft EIR for a 45-day public review period, which ended on March 1, 2004. The EIR includes an analysis of potential environmental impacts associated with the purchase and future use of the BWD lands, assignment of the CVP water supply for use within the Pajaro Valley, and the potential resale of the property without the CVP water supply. PVWMA anticipates completion of the Final EIR and subsequent circulation to commenting agencies in May 2004.

CHAPTER 2.0

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

CHAPTER 2.0
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter provides a description of the Proposed Action and associated alternatives. Specifically, what follows is a description of the Proposed Action Alternative and the No Action Alternative. At this time no other alternatives have been identified that meet the purpose and need of this action and therefore no additional alternatives are being evaluated in this Environmental Assessment (EA) at this time.

2.1 PROPOSED ACTION ALTERNATIVE

The Broadview Water District (BWD) and the Pajaro Valley Water Management Agency (PVWMA) propose, on a willing-seller/willing-buyer basis, to permanently assign BWD's existing Central Valley Project (CVP) water service contract to PVWMA. Currently, PVWMA is in escrow to purchase, on a willing-seller/willing-buyer basis, approximately 9,100 acres of lands within BWD in order to take assignment of BWD's CVP water supply contract (i.e., Contract No. 14-06-200-8092-IR7) for up to 27,000 acre-feet per year (afy) of CVP water. PVWMA is in escrow with the sole right to purchase these lands from selling landowners.

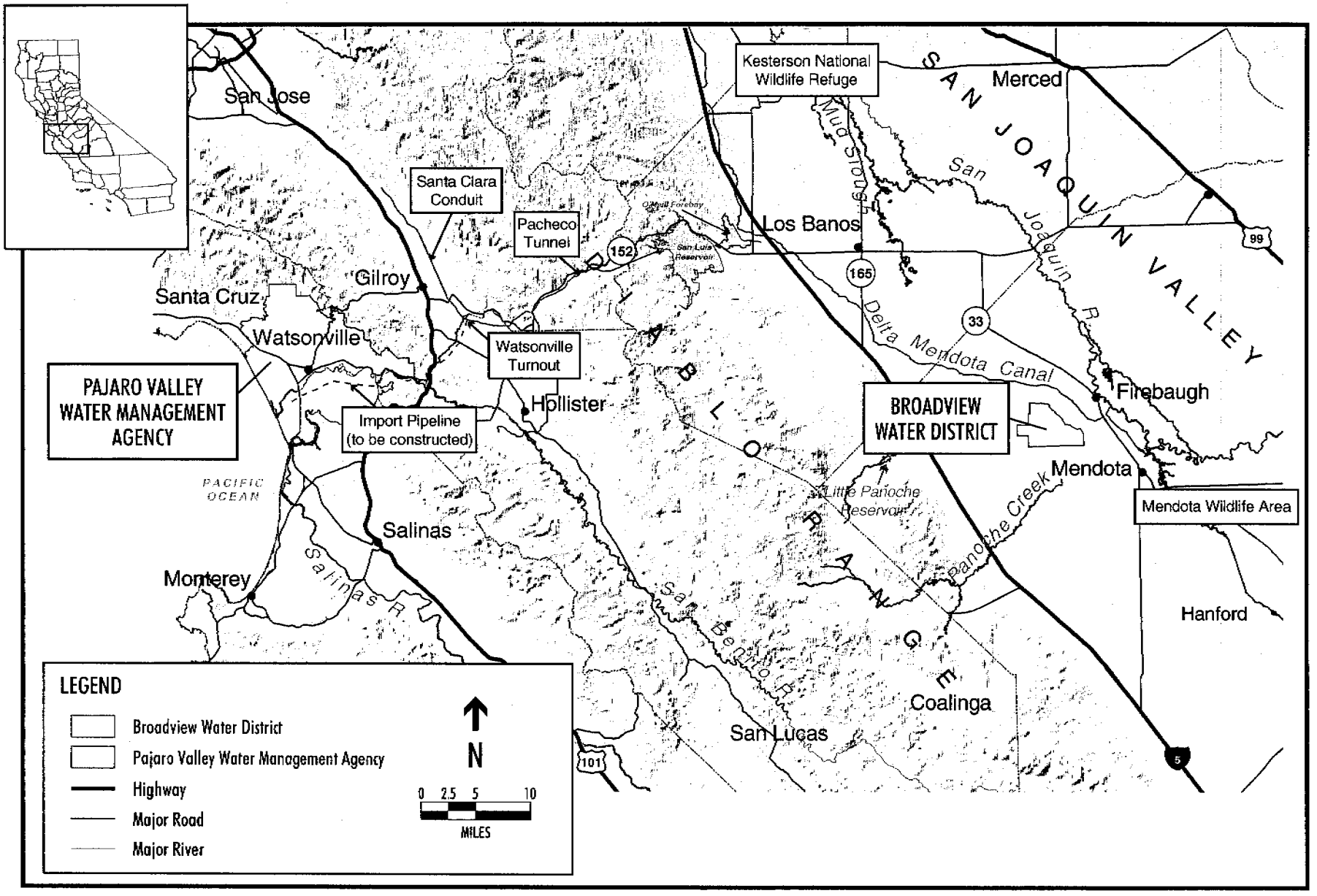
The Proposed Action requiring the approval of the Bureau of Reclamation (Reclamation) is solely related to the assignment of BWD's existing CVP water supply contract to PVWMA. It is understood that assignment to PVWMA will be subject to CVP reliability and deliverability, existing short-term interim contract renewals, and a long-term contract renewal. At present, BWD has an interim renewal contract effective March 1, 2004 through February 28, 2006.

2.1.1 DURATION OF ASSIGNMENT

The water contract assignment from BWD to PVWMA is a permanent assignment. It would remain in effect through the duration of the existing water service contract with Reclamation, and would be subject to contract renewals according to the contract and federal Reclamation law.

2.1.2 SOURCE AND DELIVERY OF WATER

The water supply subject to the proposed contract assignment is CVP water currently delivered to BWD pursuant to its water service contract with Reclamation. The existing interim contract will, at some point, be renewed as a long-term contract. BWD is located on the west side of the San Joaquin Valley and approximately five miles west of Firebaugh, in Fresno County. BWD takes delivery of CVP water through the Delta-Mendota Canal (DMC) (**Figure 2-1**). Under the



SOURCE: California Data Exchange, 2002; and Environmental Science Associates, 2003

Figure 2-1
Regional Water Distribution System

Proposed Action, water would not be delivered to BWD; rather it would be delivered to PVWMA through federal CVP facilities. Specifically, water would be released from the San Luis Reservoir to the Pacheco Tunnel and on to the Santa Clara Conduit where PVWMA would take delivery of it through its, to-be-constructed, Import Pipeline[2] (**Figure 2-1**). Any water from this proposed assignment temporarily transferred by PVWMA to another entity, as PVWMA constructs its Import Pipeline facilities, is speculative at this point in time and is not covered within the scope of this document. Those actions would be subject to additional environmental documentation as those details and plans become better defined or known.

2.1.3 AMOUNT OF WATER

The Proposed Action involves up to 27,000 afy, which is the total BWD CVP contract entitlement, less approximately 23 afy. BWD is the current CVP contractor for that water and, therefore, BWD is proposing to assign its entitlement under contract with the federal government to PVWMA. However, it is recognized that a small amount of water (approximately 23 afy) is provided by the San Luis Division and conveyed through the Westlands Water District (Westlands) to BWD pursuant to a contract between Westlands and BWD dated August 21, 1979. This 23 afy of water will remain within BWD for continued treatment and potable use at the BWD and the limited residences within the BWD.

At present, 30 individual landowners within BWD, representing nearly all of the privately owned land within the BWD, have agreed to sell their land. With the implementation of the Proposed Action, BWD would no longer provide irrigation water to these lands. For this reason, the EA considers the effects of a full assignment of the contract entitlement from BWD to PVWMA. As the BWD contract is for irrigated agriculture, water deliveries to PVWMA will coincide with Reclamation's agricultural delivery schedule for areas south of the Delta. All of the water assigned under the Proposed Action would be used directly for irrigated agriculture and none of the water to be assigned under this contract would be used for municipal and industrial uses[3].

2.1.4 CONTRACT ASSIGNEE

The contract assignee is PVWMA, with its principle offices located in Watsonville, Santa Cruz County, California. As part of the Proposed Action, PVWMA would enter into a contract with Reclamation for the assignment of BWD's CVP water service contract entitlement. This action would require the approval of the contract assignment by Reclamation's Contracting Officer. As an assignee of the BWD contract, PVWMA will be subject to all terms and conditions of Contract No. 14-06-200-8092-IR6 and subsequent renewals. This includes all provisions of federal

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2 PVWMA is in the process of designing and constructing an importation pipeline as part of its Revised Basin Management Plan (Revised BMP) to be able to take delivery of CVP water and/or other imported water. The environmental effects of the Revised BMP, the Import Pipeline, and use of CVP water within PVWMA was analyzed in previous CEQA document and is currently undergoing a separate NEPA review with a Record of Decision anticipated in May 2004. As these effects were/are being analyzed in these documents, which are incorporated by reference, they are not re-visited in this document.

3 PVWMA's enabling act provides that PVWMA may only import water for agricultural uses, with a small exception for land within the Aromas Water District which has a demand of 300 afy. (Cal Water Code App. 124-710)

3.2 WATER RESOURCES

3.2.1 WATER SUPPLY

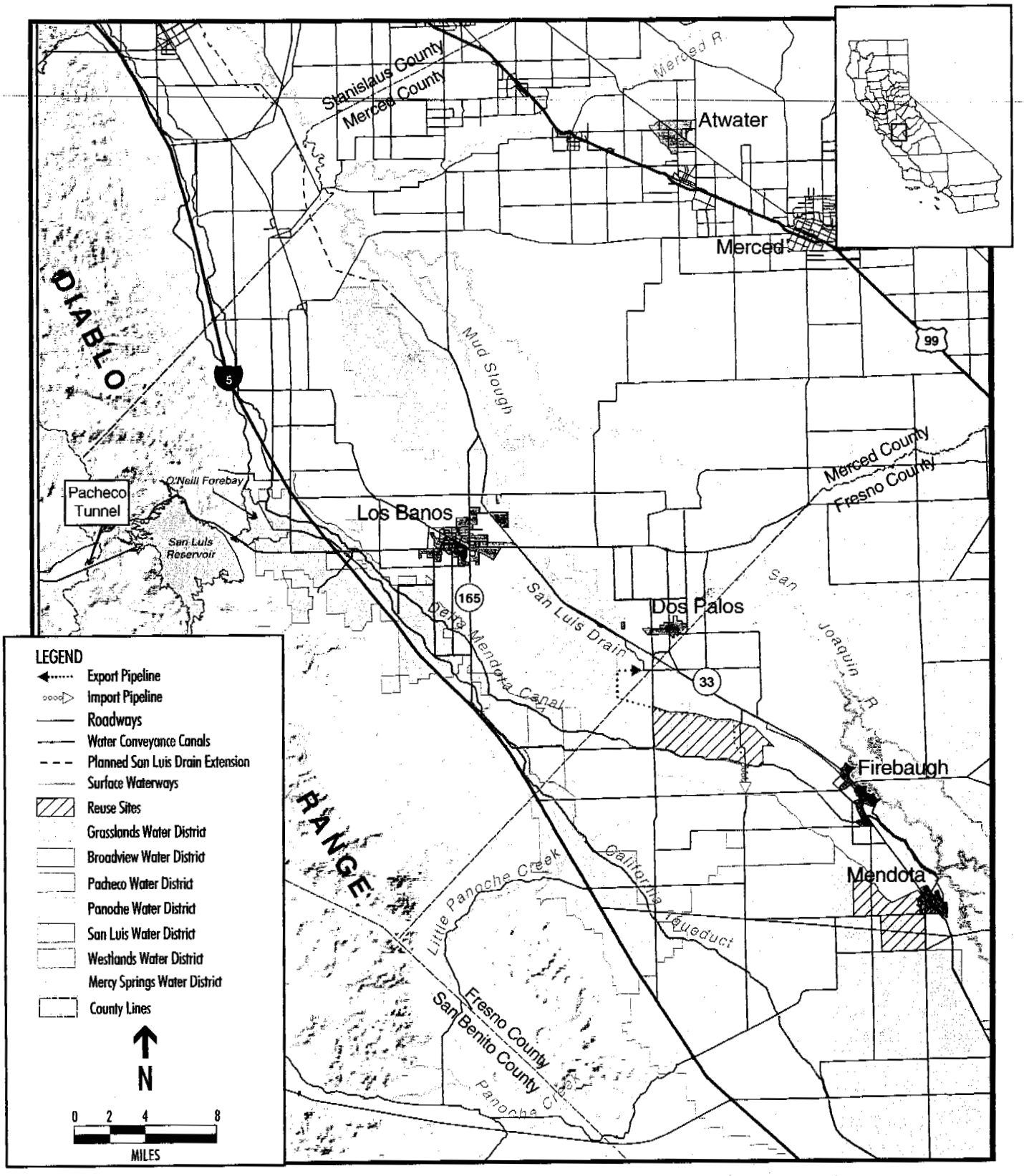
BWD is a CVP contractor and receives its CVP water from the Delta-Mendota Canal (refer to **Figure 3-2**). Due to the demand for water supplies within the CVP and operational restrictions placed on the CVP by a number of factors, including the CVPIA, and other hydrologic factors, it has been predicted by Reclamation that agricultural contractors south of the Delta will receive an average annual allocation of approximately 60 to 70 percent of their total contract entitlements. This delivery rate generally corresponds with BWD's allocated assignment over the past ten years, as provided in **Table 3-1**. Due to high concentrations of salts, selenium, and boron in the soil column, groundwater is not suitable to be used as a water supply in Broadview. In recent years, BWD has however, been using a small amount of groundwater and drain water to grow salt tolerant crops and blending it with delivered CVP supplies for drainage water quality management and stretching limited water supplies.

TABLE 3-1
WATER DELIVERY RATES FOR THE BROADVIEW WATER DISTRICT FROM 1993 THROUGH 2003

Year	Allocated Assignment (afy) [1]	Percentage of Contract Assignment
1993	10,687	39.6
1994	19,263	71.3
1995	14,766	54.7
1996	17,667	65.4
1997	17,640	65.3
1998	12,374	45.8
1999	16,303	60.4
2000	15,902	58.9
2001	14,554	53.9
2002	12,122	44.9
2003	13,065	48.4
10-Year Average	**14,940.3**	**55.3**

1 Data supplied by Tracy Field Office, Water Division, Central Valley Operations Office.

Source: Reclamation, 2004



Broadview Water Contract Assignment Project EA / 202529 ■

SOURCE: California Data Exchange, 2002; and Environmental Science Associates, 2003

Figure 3-2
Local Hydrology and
Water Conveyance

3.2.2 IRRIGATION WATER SUPPLY, DISTRIBUTION, DRAINAGE AND RECYCLING SYSTEM

Figure 3-1 illustrates BWD's irrigation, distribution, drainage, and recycling system. BWD receives CVP water from the Delta-Mendota Canal through two 60-inch buried pipelines (refer to **Figure 3-2**). These pipes convey water from the Delta-Mendota Canal to the District service area, located approximately two miles to the south. Once in the District, the water is placed in BWD's Main Canal, which begins at the intersection of Nees and Fairfax Avenues (see **Figure 3-1**). The Main Canal is a combination of an open, unlined canal and buried pipe system that conveys water from the lower elevation areas in the north to the higher elevations in the south. Six lift stations are necessary on the canal to lift the water to the higher elevations on the south side of the District. As irrigation water travels through the Main Canal, it is dispersed to parcels for irrigation by a system of eight laterals. Each lateral runs in a west to east direction from the Main Canal allowing the water to flow by gravity following the drop in elevation from west to east within BWD (see **Figure 3-1**).

The BWD drainage system was constructed to lower groundwater elevations within the BWD service area. As shown in **Figure 3-1**, the system consists of tile drains and sumps which collect groundwater and pump it into open channels that drain to the north. These channels discharge into the Main Drain which lies along the northern Boundary of BWD. Drain water lift stations are necessary along the Main Drain to convey drain water from the lower elevations on the east to the Nees Station to the west. As depicted in **Figure 3-2**, the Nees Station discharges drain water from BWD through a 36-inch pipe to the San Luis Drain which then ultimately discharges to the San Joaquin River. One method being used by BWD to manage the salinity, selenium, and boron in its discharged water is by recycling a portion of the drain water by mixing it with the delivered irrigation water in the Main Canal. This strategy also provides some drain water to the Main Canal for use as recycled water flow in the incoming water supply. Through this system, a portion of the drain water from the Main Drain is introduced back into Main Canal, contingent on the salt and selenium concentrations in the drain water and the total maximum monthly loads being discharged from the Main Drain. A drain water quality monitoring station is located at Nees Pump Station where these levels are monitored.

3.2.3 HYDROGEOLOGY

Lands within BWD are regarded as drainage impaired. BWD is located on the northeastern slope of the Panoche alluvial fan. The fan was primarily produced by the outflows of the Panoche Creek from the Diablo Range. Flood flows occur on a regular basis and convey large quantities of silt into northern sections of the BWD. This silt is the source of selenium in the soils on this portion of the west side of the San Joaquin Valley (BWD Water Management Plan, 1993). The hydrogeological framework in the western San Joaquin Valley is generally divided into three major zones: 1) an upper unconfined to semi-confined aquifer system; 2) a confining clay zone commonly referred to as "blue clay" or Corcoran clay"; and 3) a confined aquifer system below the confining clay layer. The depth to the confining clay layer ranges from 350 to 450 feet, creating a shallow groundwater system of approximately the same thickness (RMC, 2003). The

quality costs and regulations increase, it is expected that the lands within BWD will become increasingly fallowed in the future. At some point, agricultural land irrigated with CVP water will become uneconomical for BWD farmers thereby likely necessitating their permanent retirement and/or selling of the CVP water service contract.

BWD currently operates a 100-acre drainage water reuse test plot under the umbrella of the Grasslands Area Farmers in the northern section of the BWD. Presently, agroforestry[1] demonstrations focus on irrigation, drainage, salt management, and wildlife protection. This test lot represents a fraction of a larger management scheme being developed for long-term viability of salt-tolerant agroforests, including trees and halophytes[2]. These schemes include: maintenance of soils to ensure growth of trees and halophytes using high salt/boron content drainage water for irrigation; determination of adverse wildlife impacts associated with irrigating with drainage water containing selenium; development of agronomic design and management to improve evapotranspiration, growth, and sustainability; and safe disposal and/or marketing of salts. This research plot would continue under all three alternative scenarios. Issues still to be addressed include: developing management schemes for salt-tolerant trees irrigated with saline drainage water while maintaining sustainable soils; avoiding or mitigating potential adverse impacts on birds and wildlife; and disposing of accumulated salts.

CALIFORNIA FARMLAND MAPPING AND MONITORING PROGRAM

Farmlands within the BWD are not delineated on the most recent Important Farmlands Map (2000) for Fresno County as prepared by the California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) (Department of Conservation, 2002). A review of the soil candidate listing for Fresno County indicates that soil resources found within the BWD do not meet the DOC-specified criteria for Prime Farmland. However, conversations with DOC staff revealed that preliminary mapping efforts for western portions Fresno County have commenced with map completion expected for early 2004. DOC staff have confirmed that much of the land base within the BWD will be classified as Farmland of Statewide Importance[3] for the 2004 map series (Mike Cisco per comm., 2003).

CALIFORNIA LAND CONSERVATION ACT

Under the provisions of the California Land Conservation Act of 1965, Section 51200, commonly referred to as the "Williamson Act," a landowner may contract with the County to maintain agricultural or open space use of their lands in return for reduced property tax assessment. The contract is self-renewing and the landowner may notify the County at any time of intent to

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1 Agroforestry is a collective name for land-use systems and practices where woody perennials are deliberately integrated with crops and/or animals on the same land management unit. The integration can be either in spatial mixture or in temporal sequence.

2 Plants that can grow under extremely saline conditions, such as atriplex or salt bush.

3 The Farmland of Statewide Importance classification is used for lands that have been used for irrigated agricultural production at some time during the four years prior to the mapping date (2004)

withdraw the land from its preserve status. Withdrawal involves a ten-year period of tax adjustment to full market value before protected open space can be converted to urban uses. Consequently, land under a Williamson Act Contract can be in either a renewal status or a nonrenewable status. Lands with a nonrenewable status indicate the farmer has withdrawn from the Williamson Act Contract and is waiting for a period of tax adjustment for the land to reach its full market value. Nonrenewable and cancellation lands are candidates for potential urbanization within a period of ten years. A list of active Williamson Act contracts within the BWD is provided in **Appendix A**. According to the Fresno County Assessor's Office, none of the contracted parcels are undergoing the non-renewal process, nor have any of them initiated cancellation procedures.

3.5 AIR QUALITY

BWD is located in unincorporated Fresno County near the geographic center of the San Joaquin Valley Air Basin (SJVAB). SJVAB is a predominantly flat area bordered on the east by the Sierra Nevada range; on the west by the Coast Ranges; and to the south by the Tehachapi mountains. The region's topographic features act to restrict air movement through and out of the basin. Airflow in the SJVAB is primarily influenced by marine air that enters through the Carquinez Straits where the San Joaquin-Sacramento Delta empties into the San Francisco Bay (SJVUAPCD, 1998). Wind speed and direction play an important role in air pollutant dispersion and transport and, as a consequence, the SJVAB is highly susceptible to pollutant accumulation over time (SJVUAPCD, 1998). Frequent transport of pollutants into the SJVAB from upwind sources also contributes to poor air quality.

The SJVAB has a Mediterranean climate with an average of 260 sunny days per year. The valley floor generally has warm, dry summers and cool, wet winters. Average annual rainfall is approximately 12 inches per year. Daily summer high temperatures average approximately 95°F, while winter lows average approximately 45°F.

Regulation of air pollution is achieved through both national and state ambient air quality standards and emissions limits for individual sources of air pollutants. The Clean Air Act Amendments were passed in 1990. This Act directed the Environmental Protection Agency (EPA) to establish nationwide standards for the quality of air that we breath. **Table 3-3** presents both sets of ambient air quality standards and provides a brief discussion of the related health effects and principal sources for each pollutant. Currently, the San Joaquin Valley is designated non-attainment for federal ozone (O3)[4] and particulate matter (PM10)[5] standards. These standards were established based upon human health needs. Agriculture, within its normal activities, contributes to elevated levels of particulate matter and ozone within the SJVAB.

For most areas where significant quantities of agricultural air emissions are generated, EPA standards are only exceeded during specific time periods (e.g., harvesting). During the winter, wind speed and direction data indicate that wind occasionally varies from the south-southeasterly direction, and originates from the south end of the Valley, flowing in a north-northwesterly direction. Also during the winter months, the SJVAB experiences light, variable winds of about 10 mph. Low wind speeds, combined with low-lying inversion layers in the winter, create a climate conducive to the formation of high PM10 concentrations (SJVAPCD, 2003a).

4 Ozone is a reactive pollutant, which is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NOx). ROG and NOx are precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours.

5 "Respirable" particulate matter (PM10) and "fine" particulate matter (PM2.5) consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively (a micron is one-millionth of a meter). PM10 and PM2.5 represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects.

Atmospheric inversions are also common during the summer, however ozone levels generally do not exceed EPA standards. Because solar energy is required to form ozone and the chemical reactions are not instantaneous, the greatest concentrations of ozone are usually downwind of urban centers and experienced in the afternoon during summer months when sunlight is most intense (SJVAPCD, 2001).

TABLE 3-3
FEDERAL AND STATE CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time [1]	Federal Primary Standard [2]	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone (O_3)	1 hour	0.12 ppm	Irritation and possibly permanent lung damage.	Motor vehicles.
	8 hours	0.08 ppm*		
Carbon Monoxide (CO)	1 hour	35 ppm	Deprives body of oxygen in the blood. Causes headaches and worsens respiratory problems.	Primarily gasoline-powered motor vehicles (e.g., internal combustion engines)
	8 hours	9.0 ppm		
Nitrogen Dioxide (NO_2)	Annual Average	0.05 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining, industrial sources, aircraft, ships, and railroads.
	1 hour	---		
Sulfur Dioxide (SO_2)	Annual Average	0.03 ppm	Irritates and may permanently injure respiratory tract and lungs. Can damage plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	---		
	24 hours	0.14 ppm		
Suspended Particulate Matter (PM10 & PM2.5)	Annual Geometric Mean	65 $\mu g/m^3$ (PM2.5)	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Arithmetic Mean	50 $\mu g/m^3$ (PM10)		
	24 hours	150 $\mu g/m^3$ (PM10) 15 $\mu g/m^3$ (PM2.5)		
Lead	Monthly	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurologic dysfunction (in severe cases).	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	1.5 $\mu g/m^3$		
Sulfates (SO_4)	24 hours	---	Similar to sulfur dioxide.	Industrial processes refineries.
Hydrogen Sulfide (H_2S)	1 hour	---	Very pungent odor similar to rotten eggs.	Annoying and irritating – high concentrations fatal.

NOTE: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter

1. Time period in which the highest reading is recorded and compared to federal standard.
2. The levels of air quality necessary, with an adequate margin of safety to protect public health.

Source: California Air Resources Board, *Ambient Air Quality Standards*, January 25, 1999.

Like typical agricultural activities throughout Fresno County and the San Joaquin Valley, BWD's agricultural activities can contribute to the production of regional PM10, PM2.5, and ozone emissions. However, air quality within BWD or as a direct result of BWD's agricultural practices has not been identified as a specific issue or problem. BWD's existing agricultural practices for growing annual field crops such as cotton, processing tomatoes, cantaloupe, small grain (wheat and barley), and sweet corn involve numerous ground preparation, tillage, planting, crop dusting and harvest operations. It is not uncommon for the ground disturbing activities to involve working the land with heavy equipment numerous times (4–6 or more times) during the year and involving discing, grading, deep and shallow ripping, leveling, harvesting, and discing crop stubble. In addition, the fallowed lands, approximately one third of the 9,200 acres, are worked much less intensively as they are disced once per year to control weed and pests. All of these existing activities contribute to particulate matter and ozone production. Early fall is the time when air quality is generally at its worst when soil conditions are at their driest and light winds prevent adequate dispersion.

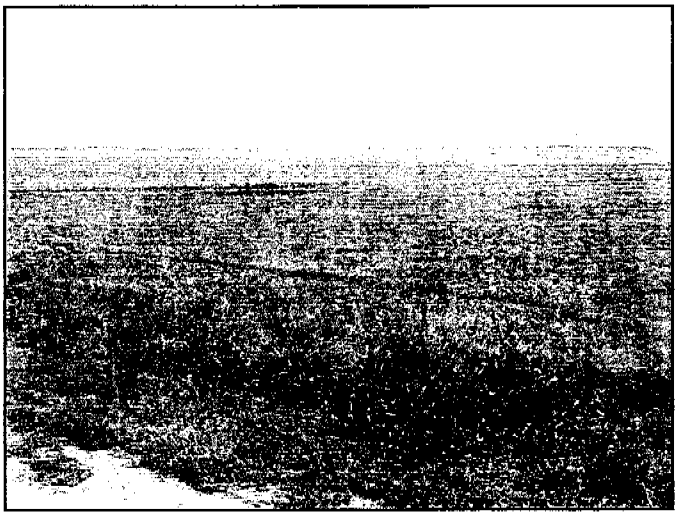
3.6 BIOLOGICAL RESOURCES

Terrain within the project area is essentially level, with the exception of several levees that parallel various drainage and irrigation canals within the BWD. Land use in the area consists of irrigated croplands. Natural communities are largely absent due to extensive agricultural development, although small pockets of salt-tolerant scrub vegetation occur in and adjacent to the canals and sloughs. Representative photographs of these communities are presented in **Figures 3-4** and **3-5**. Biologists with Environmental Science Associates conducted a reconnaissance-level survey in late March, 2003, and a focused survey for palmate-bracted bird's beak (*Cordylanthus palmatus*), a federally-listed plant, in July of 2003.

The vast majority of the land in the BWD is used for crops such as cotton, tomatoes, corn, and alfalfa. Fields that are not in production lay fallow, and support moderate to dense populations of weedy species including shepherd's purse (*Capsella bursa-pastoris*), annual sowthistle (*Sonchus oleratceus*), common groundsel (*Senecio vulgaris*), bindweed (*Convulvulus arvensis*), and little mallow (*Malva parviflora*). Fallow fields are regularly disked to control the spread of these weedy species.

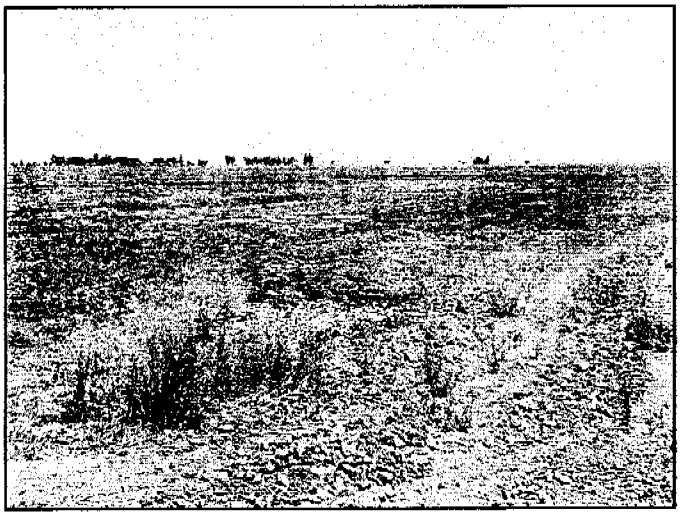
The Delta-Mendota Canal and the seven lateral irrigation canals (running east-west) are maintained free of vegetation for efficient water transport. The various agricultural drains in the BVD provide limited freshwater habitat for fish, amphibians, reptiles, and waterfowl, but roads, levees, and agricultural activities have effectively eliminated any riparian habitat. In addition, every three to five years the four main drains (running south-north; Douglas Drain, Newcomb Drain, Jerrold Drain, and Hudson Drain) are routinely cleared of brushy vegetation. In between these maintenance events, salt-tolerant vegetation becomes established. Vegetative growth in the channels varied from sparsely distributed forbs and grasses to dense shrub thickets. Exotic grasses and forbs such as foxtail (*Hordeum murinum*), bermuda grass (*Cynodon dactylon*), London rocket (*Sisymbrium irio*), dock (*Rumex* sp.), wild radish (*Raphanus raphinistrum*), prickly lettuce (*Lactuca serriola*), and sowthistle (*Sonchus oleraceus*) were observed growing in the open channels. Native grass and forbs included sprangletop (*Leptochloa* sp.), cattail (*Typha* sp.), and fiddleneck (*Amsinckia* sp.). Native tree and shrub species such as bracted saltbush (*Atriplex serenana*), shining willow (*Salix lucida*), black willow (*Salix gooddingii*) and cottonwood (*Populus* sp.) were observed, as well as non-native Salt cedar (*Tamarix* sp.) tobacco tree (*Nicotiana glauca*) and gum tree (*Eucalyptus* sp.). Salt cedar, gum tree and saltbush occur in thick rows acting as windbreaks along some drains; other trees in the area are widely dispersed.

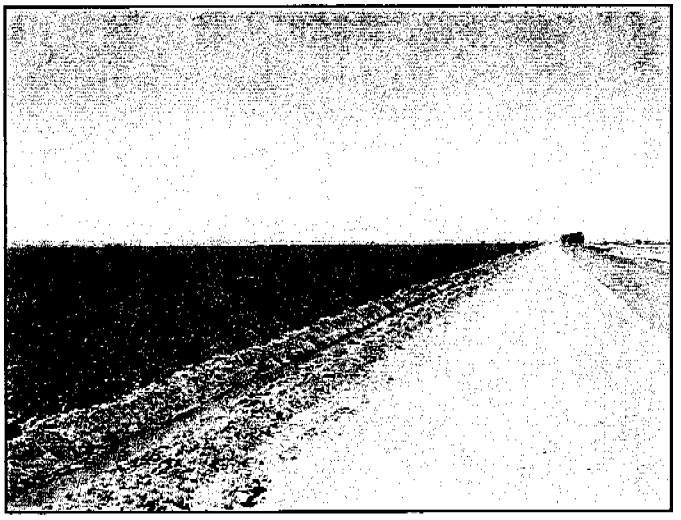
The BWD lands described above were observed to support a variety of wildlife species, especially birds, and a few mammals and amphibians. **Appendix B** presents a list of wildlife observed during two site-visits. The majority of the wildlife was observed in or adjacent to the drains, although some species also used ruderal vegetation and cleared fields. Existing trees, utility poles and wires at the site provide perches, however there is a lack of trees suitable for cavity-nesting birds and a lack of undisturbed land with adequate cover for raptors that nest on the ground. Ground squirrels and pocket gopher-sized burrows were observed on the edges of some drains and in some fields. Desert cottontail (*Sylvilagus audobonii*) was also noted in or



Fallow field in spring 2003

Fallow field in summer 2003





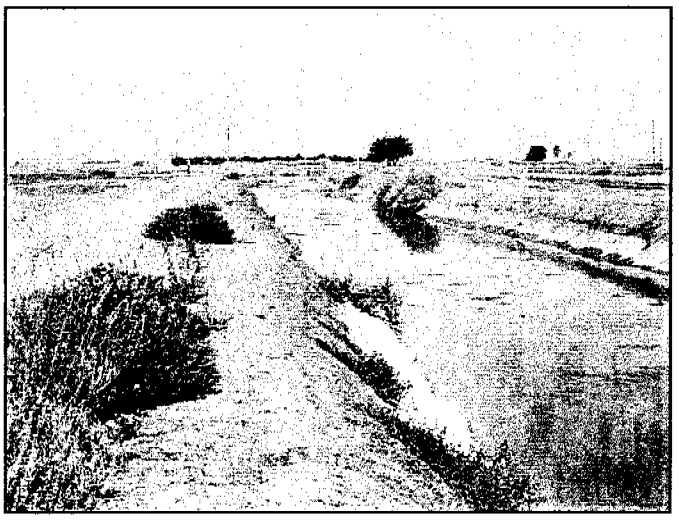
Agricultural field in production, summer 2003

SOURCE: Environmental Science Associates, 2003

Figure 3-4
Project Area Site Photographs

Cleared agricultural drain

Riparian vegetation in agricultural drain



Main drain

SOURCE: Environmental Science Associates, 2003

Figure 3-5
Project Area Site Photographs

adjacent to drains, as were amphibians such as Pacific tree frog (*Hyla regilla*) and bullfrog (*Rana catesbeiana*). Aquatic wildlife observed included small warm water fish and evidence of freshwater clams which were not identified to species. No reptile species were observed within the BWD during ESA's site reconnaissance.

3.6.1 SPECIAL-STATUS SPECIES

Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized in some fashion by federal, state, or other agencies as deserving special consideration. Some of these species receive specific legal protection pursuant to federal or state endangered species legislation. Others lack such legal protection, but have been characterized as "sensitive" on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this report, following a convention that has developed in practice but has no official sanction. A list of special status species potentially occurring in the project area, and a brief description of their preferred habitats is presented in **Appendix C**.

3.6.2 DRAINAGE ISSUES

Since identification of the selenium problem at Kesterson Reservoir in the mid-1980s, the lower San Joaquin Valley region has experienced and continues to deal with drainage problems. Much of the water drained from irrigated farmland in this region contains high amounts of contaminants. Selenium is one contaminant that is of particular concern, as in high amounts it is known to adversely affect wildlife species such as waterfowl and river otters. Selenium naturally occurs in high amounts in the soils of the western San Joaquin Valley, including the BWD. Contamination, however, does not become a problem until the water from continual, high-volume irrigation leaches the selenium from the soil, concentrating and mobilizing it in the water table. Selenium toxicity in wildlife results in a variety of effects including gross embryo deformities, winter stress syndrome, depressed immune system function, and reduced juvenile growth and survival rates. Disposal of drain water is an ongoing problem for the BWD and throughout the region.

3.7 CULTURAL RESOURCES

BWD is located within the San Joaquin Valley of California. The San Joaquin Valley covers a large area and significant variation is apparent. A general synthesis of the prehistory of the San Joaquin Valley is provided by Moratto (1984).

3.7.1 PREHISTORIC SETTING

During the Early Holocene, the area was populated by hunters of large game. Surface finds in the Tulare Basin have yielded some projectile points similar to particular Paleoindian variants (i.e., Clovis). This would suggest an initial occupation pre-dating 11,300 B. P. The Middle Holocene (4000 to 1000 B.C.) is characterized by pinto-like points, and groundstone, although its association is not certain. Excavations at Buena Vista Lake dating to after 2000 B.C. (Early Buena Vista Lake Phase) uncovered handstones, millingstones, and extended burials. They did not find asphaltum, obsidian, or baked clay.

As summarized in Moratto (1984), a chronology was devised for the southern San Joaquin Valley based on western Valley sites in 1969 by Olsen and Payen. It is composed of four temporally distinct complexes. The first complex, the Positas Complex ranges from 3300 to 2600 B.C. and is characterized by small shaped mortars, short cylindrical pestles, milling stones, perforated flat cobbles, and spire-lopped *Olivella* beads.

The Pacheco Complex, beginning in approximately 2600 B.C. and ending in roughly A.D. 300, has been divided into two phases. The Pacheco, Phase B (2600 to 1600 B.C.) is characterized by foliated bifaces, rectangular *Haliotis* ornaments, and thick, rectangular *Olivella* beads. The Pacheco, Phase A (1600 B.C. to A.D. 300) is represented by more varied types of shell beads; *Olivella* beads of spire-ground, modified saddle, saucer, and split-drilled types, as well as *Haliotis* disc beads and ornaments are present. Other artifacts characteristic of this phase are perforated canine teeth; bone awls, whistles, and grass saws; large stemmed and side-notched points; and an abundance of millingstones, mortars, and pestles. The shell and bone industries of the Pacheco Complex are most comparable to the Delta Middle Horizon Period. Other traits indicate relations with areas to the west and south.

The Gonzaga Complex (A.D. 300 to 1000) is represented by an assemblage similar to that of the Delta Late Horizon, Phase I. This complex is characterized by extended and flexed burials; bowl mortars and shaped pestles; squared and tapered stem projectile points; few bone awls and grass saws; and a shell industry composed of distinctive *Haliotis* ornaments and rectangular, split-punched, and oval *Olivella* beads.

The Panoche Complex (A.D. 1500 to European Contact) is most comparable to the Delta Late Horizon, Phase II. This complex is characterized by the presence of few millingstones, and varied mortars and pestles; small side-notched arrow points; clamshell disc beads; *Haliotis* epidermis disc beads; *Olivella* lipped, side-ground, and rough disc beads; bone awls, whistles, saws, and tubes. Flexed burials and primary and secondary cremations are found.

3.7.2 ETHNOGRAPHIC SETTING

The project area was originally inhabited by the Northern Valley Yokuts. Ethnographic information about this group is sparse due to the early decimation of the aboriginal populations in the lower San Joaquin Valley. Most information regarding this group is gleaned from accounts of Spanish military men and missionaries that have been translated. A summary of these sources has been compiled by W. J. Wallace (1978), and it is upon this work that this brief ethnographic setting is based.

Northern Valley Yokuts territory is defined roughly by the crest of the Diablo Range on the west, and the foothills of the Sierra Nevada on the east. The southern boundary is approximately where the San Joaquin River bends northward, and the northern boundary is roughly half way between the Calaveras and Mokelumne Rivers. The Yokuts may have been fairly recent arrivals in the San Joaquin Valley, perhaps being pushed out of the foothills about 500 years ago.

Population estimates for the Northern Valley Yokuts vary from 11,000 to more than 31,000 individuals. Populations were concentrated along waterways and on the more hospitable east side of the San Joaquin River. Villages, or clusters of villages, made up "miniature tribes" (tribelets) lead by headmen. The number of tribelets is estimated at 30 to 40; each tribe spoke their own dialect of the Yokuts language. Combined with the Southern Valley Yokuts and the Foothill Yokuts dialects, these tongues formed the Yokutsan linguistic family of the Penutian Stock (Shipley, 1978).

Principal settlements were located on the tops of low mounds, on or near the banks of the larger watercourses. Settlements were composed of single family dwellings, sweathouses, and ceremonial assembly chambers. Dwellings were small and lightly constructed, semi-subterranean and oval. The public structures were large and earth covered. Sedentism was fostered by the abundance of riverine resources in the area.

Subsistence among the Northern Valley Yokuts revolved around the waterways and marshes of the lower San Joaquin Valley. Fishing with dragnets, harpoons, and hook and line yielded salmon, white sturgeon, river perch, and other species of edible fish. Waterfowl and small game attracted to the water also provided a source of protein. The contribution of big game to the diet was probably minimal. Vegetal staples included acorns, tule roots, and seeds.

Goods not available locally were obtained through trade. Paiute and Shoshone groups on the eastern side of the Sierra were suppliers of obsidian. Shell beads and mussels were obtained from Salinan and Coastanoan groups. Trading relations with Miwok groups yielded baskets and bows and arrows. Overland transport was facilitated by a network of trails, and tule rafts were used for water transport.

Most Northern Valley Yokuts groups had their first contact with Europeans in the early 1800s, when the Spanish began exploring the Sacramento-San Joaquin river delta. The gradual erosion of Yokuts culture began during the mission period. Escaped neophytes (e.g., missionaries) brought foreign (European and Native American) habits and tastes, and Spanish expeditions to

recover escapees. Epidemics of European diseases played a large role in the decimation of the native population. With the secularization of the mission and the release of neophytes, tribal and territorial adjustments were set in motion. People returned to other groups, and a number of polyglot "tribes" were formed. The final blow to the aboriginal population came with the Gold Rush and its aftermath. In the rush to the southern mines, native populations were pushed out of the way, and out of their territories. Ex-miners settling in the fertile valley applied further pressure to the native groups, and altered the landforms and waterways of the valley. Many Yokuts resorted to wage labor on farms and ranches. Others were settled on land set aside for them on the Fresno and Tule River Reserves.

3.7.3 HISTORIC CONTEXT

The area of present-day Fresno County received visitors during the Spanish colonization of Alta California when Gabriel Moraga's expedition explored the area in 1805. Despite this early contact, non-native settlement did not begin in the area until the American annexation of Alta California. In 1849, a group of prospectors, led by William R. Gardner, became the first non-native settlers in Fresno County.

Throughout the Gold Rush period, pioneering settlement was concentrated in the Sierra Nevada and the Mother Lode region. The first formal settlement began in 1868 when A. Y. Easterby purchased more than 5,000 acres just east of present-day Fresno, which was mostly converted for the cultivation of wheat. However, the arid climate of the San Joaquin Valley necessitated a regular supply of water for any intensive agricultural endeavor to succeed. With the coming of the railroad in 1872, the predominate cattle ranching gave way to agriculture, which spurred the development of canals to distribute water to Fresno County. Due to the burgeoning agriculture in the County, colonies began to develop around the various crop-growing areas. The first of these was the Central California Colony, begun in 1875. Throughout the twentieth century, agriculture has continued to remain the focus of the Central Valley.

The BWD was established by landowners in 1955 to provide irrigation water for 9,515 acres. Information Center review of historical maps (Fresno County Atlas) indicates that there were no structures in the project area in 1891. A review of available aerial photographs (from 1946 onward) and USGS topographic maps indicate that the project area has been developed with agricultural fields since at least 1946 (Lowney Associates, 2003).

3.7.4 KNOWN CULTURAL RESOURCES

METHODS

The effort to identify cultural resources in the project area included a records search, contacts with Native Americans and historical societies, a field review, and evaluation of identified resources for National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) eligibility (Environmental Science Associates, 2003).

RECORDS SEARCH

A cultural resources records search was conducted March 20, 2003 at the Southern San Joaquin Information Center located at California State University, Bakersfield. The purpose of the records search was to identify any previously known cultural resources in the project area and to determine if any or all of the project area has previously been inspected for the presence of cultural resources. The records search was conducted by Information Center staff and included a review of Information Center maps and files, as well as the National Register of Historic Places, the California Inventory of Historic Resources, California State Historic Landmarks, California Points of Historic Interest, and the California Register of Historic Resources.

The records search resulted in a finding that there are no recorded cultural resources within the project area or within a ¼ mile radius. The records search also indicated that there has been no previous cultural resource studies conducted within the project area or within a ¼ mile radius.

CONTACTS WITH NATIVE AMERICANS

The Native American Heritage Commission (NAHC) was contacted by an ESA archaeologist in April 2003 to request a search of the sacred lands file and to request a list of Native Americans that should be contacted. The NAHC indicated that the sacred land file failed to identify the presence of any known Native American cultural resources in the project area. The NAHC also supplied a list of three Native American organizations that may have knowledge of cultural resources in the project area. All three Native American organizations listed by the NAHC were contacted by letter in April 2003 and provided with project information and asked if they were able to provide information about locations of importance to Native Americans. As of this date, no responses have been received.

CONTACTS WITH LOCAL HISTORICAL SOCIETIES

A letter was sent to the Fresno Historical Society of Fresno, California, on April 7, 2003, requesting any information pertaining to historical resources that may be known in the project area. To date, no response has been received.

FIELD RECONNAISSANCE

A field reconnaissance of the BWD was conducted by a ESA archaeologists on April 29, 2003. The field reconnaissance consisted of a cursory drive-by inspection and a closer examination of standing structures. Because of the very low sensitivity of the project area for surface manifestations of archaeological sites, an intensive pedestrian survey was not conducted. The entire project area consists of nearly flat alluvial deposits with no natural water courses or natural topographical features. Therefore the focus of the field reconnaissance was to review the project area for potentially historical buildings and structures.

3.7.5 IDENTIFIED CULTURAL RESOURCES

Archaeological Resources. Based on a records search, contacts with Native Americans, and a cursory field reconnaissance, no archaeological sites have been identified within the project boundaries (defined by the BWD service area). Due to the alluvial depositional context of the project area, it is likely that prehistoric archaeological sites would be deeply buried under locally accumulated sediments.

Historical Resources. Twenty seven existing buildings were identified in the project area. Of these, 12 buildings are at least 50 years old and the remaining buildings are of recent construction. All of the buildings over 50 years old are associated with localized farming and consist of farm labor camp residences and associated sheds, which are ubiquitous throughout the Central Valley. Most or all of the 12 buildings that are at least 50 years old have been moved from their original location and 1 has been extensively modified.

Application of the criteria for Section 106 of the NHPA resulted in a finding that no properties identified in the project area are eligible for either the CRHR or the NRHP. Identified buildings are not associated with significant events or persons, are not of a distinctive style, and are not likely to yield information important in history.

3.8 GEOLOGY AND SOIL RESOURCES

3.8.1 GEOLOGY

The BWD lies within the physiographic region of California referred to as the Great Valley geomorphic province. The Great Valley lies between the mountains and foothills of the Sierra Nevada Range to the east and the California Coast Ranges to the west. The geologic formations of the Great Valley are typified by thick sequences of sedimentary materials of Jurassic through Holocene age. Stratigraphically, the California Geological Survey (previously the Division of Mines and Geology) and the USGS have mapped the project area as being underlain by Quaternary-aged (Holocene) alluvial fan deposits (State of California, 1971). These sediments were deposited from present-day stream and river systems that have emerged from coast Ranges to the west. Older (Pleistocene) alluvial and lacustrine[6] deposits likely underlie these sediments (Matthews, R. A., Burnett, J. L., 1965).

3.8.2 SOIL RESOURCES

Soil resources within the BWD formed in alluvium derived from calcareous[7] sedimentary rocks on relatively level slopes. According to the Soil Survey Geographic Database (SSURGO), the BWD is comprised of two major soil series; including the Tranquility series and Calflax series. Tranquility soils tend to be somewhat poorly drained with clay to silty clay textures (SSURGO, 2002). In contrast, Calflax soils tend to be moderately well drained with coarser soil textures consisting of loam, silt loam or clay loam. Both soils types are characterized by a high naturally occurring water table that occurs at 4 to 6 feet below the ground surface (NRCS, 2003). These soils both generally have low organic matter contents, moderate linear extensibility (shrink-swell), and contain high equivalents of calcium carbonate and gypsum by weight (NRCS, 2003). These soils are also characterized by a high electrical conductivity[8] and high sodium adsorption ratio (SAR)[9] that is highly influenced by agricultural practices and locally shallow groundwater.

SOIL SALINITY

Salinization is the process by which water-soluble salts accumulate in the soil. Salinization is a resource concern because excess salts hinder plant growth, including the growth of commercial crops, by limiting their ability to absorb water. Salinization may occur naturally or because of conditions resulting from specific water management practices. Soil salinity is typically

6 Lacustrine deposits generally consist of fine sand, silt, and clay, which have been exposed to the surface through the gradual evaporation of Tulare Lake.

7 Calcareous – Soil containing sufficient calcium carbonate (often with magnesium carbonate) to effervesce visibly when treated with cold 0.1 N hydrochloric acid (Brady, N. C. and Weil, R. R., 1996).

8 Electrical Conductivity (EC) – The capacity of a substance to conduct or transmit electrical current. In soils or water, measured in siemens/meter, and related to dissolved solutes.

9 SAR is the standard measure of the sodicity of a soil. The SAR is calculated from the concentration (in milliequivalenets per liter) of sodium, calcium, and magnesium in the saturation extract.

estimated by measuring the EC of the soil solution in decisiemens per meter (dS/m). EC increases in a solution in direct proportion to the total concentration of dissolved salts. In semiarid areas, fields underlain with shallow saline ground waters, as in the case of the BWD, especially when surrounded by irrigated land will, when left fallow, eventually accumulate salts in the surface soil layer. The salts that accumulate at the soil surface are transported to the soil-surface by unsaturated flow-processes that are driven by the evaporation of water.

Portions of the soil resource within BWD exhibit sodic properties, since the soil column is generally dominated by sodium whereas less soluble cations (such as calcium and magnesium) are precipitated from the concentrating salts in the topsoil. Sodic soils are characterized by high pH values (> 8.0), slow permeability, surface crusting and in severe cases, massive structure. In practice, landowners frequently incorporate the use gypsum and sulfuric acid to supply calcium salts to replace excessive exchangeable sodium. However, as soil resources within BWD already contain a large quantity of gypsum precipitated out at the surface and within the topsoil, the use of such amendments generally falls short of removing sufficient quantities of exchangeable sodium.

RAINBOW REPORT

The Rainbow Report, prepared in coordination by the San Joaquin Valley Drainage Implementation Program and University of California discovered that retiring lands may act as a sink to collect drainage-flows and salt from surrounding areas (Land Retirement, Final Report, 1999). The report concluded that the essential differences between fallowing and land retirement are the size of retired blocks of land in relation to the surrounding irrigated area and the duration. The water table recedes when large areas of land are retired and the rate of transport of salt up into the surface soil is reduced relative to fallowing, but the overall magnitude of the transport may be greater because the time period over which salinization processes operate is much longer as compared to fallowing (Land Retirement, Final Report, 1999). Consequently, a large block of retired land may accumulate salts at a slower rate, but over the long term, this accumulation may result in much more salt per unit area than will an individual fallowed field (Land Retirement, Final Report, 1999). The implications of salinization occurring within the BWD and its affects on the soil resource in the context of the Proposed Project are discussed further in Chapter 4.0.

An assessment of soil salinity for the BWD was conducted in 1992 as part of efforts to provide soil salinity information to the BWD management unit and cooperating farmers. **Table 3-4** provides a summery of the assessment according to specific salinity classes by percent land area and soil depth (U.S. Salinity Laboratory, 1992). The assessment was designed by dividing the BWD into 37 connected quarter sections, with each quarter corresponding to approximately 160 acres. As shown, the median quarter section salinity levels ten to increase with depth through out the BWD.

TABLE 3-4
SOILS SALINITY RANGES WITHIN
THE BROADVIEW WATER DISTRICT

Soil Depth	Salinity Range (dS/m) [A]			
	0 - 2	2 – 4	4 - 8	> 8
0–1 ft.	27.87	53.69	17.15	1.28
1–2 ft.	20.08	39.23	32.12	8.57
2–3 ft.	8.56	30.12	39.01	22.31
3–4 ft.	5.09	23.64	39.85	31.42

Note: dS/m = decisiemens per meter
(A) Conductivity Scale

0-2 dS/m	negligible effects on yield
2-4 dS/m	yields of very sensitive crops may be restricted
4-6 dS/m	yields of many crops affected
6-8 dS/m	only tolerant crops yield satisfactory
> 8 dS/m	only a few very tolerant crops yield satisfactory

Source: U.S. Salinity Laboratory, 1992.

3.8.3 SEISMIC HAZARDS

The geology of the San Joaquin Valley is relatively stable as compared to other areas within California. The 2000 Uniform Building Code locates the BWD within Seismic Risk Zone 3. The majority of the project vicinity consists of alluvial flatlands and lakebed deposits. Geologic hazards that could potentially affect the BWD include seismically-induced groundshaking, differential settlement, and ground failure (including liquefaction). Strong groundshaking within the project area would most likely be caused by displacement along the San Andreas Fault Zone, located to the west. In general, groundshaking can affect areas hundreds of miles away from the earthquake's epicenter. The composition of underlying soils in areas located at a relatively far proximity from faults can intensify groundshaking. The project area lies within poorly sorted sedimentary rock, which could potentially intensify groundshaking. However, groundshaking within the BWD would be highly contingent on the earthquake's intensity and epicenter.

3.9 HAZARDS AND HAZARDOUS MATERIALS

This section addresses the hazards and hazardous materials issues related to the Proposed Action and Alternatives. A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. Factors that influence the health effects of exposure to hazardous material include the dose to which the person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility. A Phase I Environmental Site Assessment (Phase I) was prepared for the lands within the BWD by Lowney Associates on April 21, 2003 (Lowney Associates, 2003).

The Phase I included a federal, state and local regulatory agency database search for records of known storage tank sites, leaking storage tank sites, known sites with hazardous materials use, generation, storage, disposal, and sites with soil or groundwater contamination. The conclusions and recommendations provided in the Phase I are summarized below:

- **Agricultural Chemicals.** The agricultural history of the site has resulted in the use of pesticides and herbicides. Lowney Associates recommended that soil sampling and analysis for organochlorine pesticides, chlorinated herbicides, paraquat dichloride, arsenic, lead, and mercury be conducted to determine the potential health and ecological risks for future land use.

- **Selenium.** Elevated concentrations of selenium are present naturally in the soils on the site. Selenium is discharged from the site in the drainage water, and the BWD has received violations in the past for exceeding its allowable monthly discharge concentrations. Lowney Associates recommended that soil sampling and analysis for selenium be conducted in the canal sediments where it can accumulate, and that potential health and ecological risks for future land use be determined.

- **Drainage Canals and Tile Sumps.** Drainage water from the site is collected in drainage canals and 25 tile sumps and then discharged to the San Joaquin River. The water is sampled for selenium, boron, molybdenum, and electrical conductivity on a weekly basis. Lowney Associates recommended that drainage water sampling and analysis for pesticides, herbicides, and nitrates be conducted, and that potential health and ecological risks for future land use be determined from the weekly sampling data as well as the additional sampling data. Lowney Associates also recommended that canal sediments be sampled and analyzed for pesticides, herbicides, arsenic, lead, mercury, selenium, boron, and molybdenum be conducted, and that potential health and ecological risks for future land use be determined.

- **Developed Areas.** Environmental contamination issues were identified for several individual site parcels within the BWD. These environmental issues identified during the Phase I include lead-based paint residues; leaking above and below-ground storage containers of oil, gas, diesel and grease; soil surface residues containing elevated concentrations of pesticides, herbicides, lead, arsenic, mercury and/or other CAM 17 metals near above-ground storage tanks and other storage structures. Recommendations provided by Lowney and Associates include: soil sampling and analysis for polynuclear aromatic hydrocarbons for burn areas; ground water monitoring near known underground structures, surface soil sampling to determine impacts to soil quality at various locations; and

geophysical surveys to evaluate for the presence of underground structures are various locations.

- **Lead-Based Paint.** Peeling and flaking paint was observed on most painted structures located on the parcels. Elevated lead concentrations in soils surrounding the structures are a health hazard and can be present at concentrations that exceed hazardous waste standards. Soil sampling and analysis for lead be performed in the areas identified in the Phase I. If the buildings on site are demolished and if lead-based paint is still bonded to the building materials, its removal is not required prior to demolition. If the paint is peeling and flaking, it will need to be removed prior to demolition. The requirements of Cal/OSHA Lead in Construction Standard, Title 8, California Code of Regulations, 1532.1 should be followed during demolition activities. Any debris or soil containing lead paint or coating must be disposed at landfills that are permitted to accept such waste material.

- **Asbestos.** Due to the age of the buildings on the site, asbestos-containing materials (ACM) may be present. If demolition, renovation, or re-roofing of any buildings is to occur, an asbestos survey must be conducted under National Emissions Standards for Hazardous Air Pollutants (NESHAP) guidelines. Under NESHAP guidelines, all friable or potentially friable ACM must be removed prior to building demolition or renovation that may disturb the ACM.

- **Wells.** At least 50 BWD wells and United States Bureau of Reclamation piezometers were identified on the site. If the wells will not be used they should be abandoned in accordance with applicable regulations. In addition, Lowney Associates identified 15 wells owned by BWD that were constructed as a part of a litigation suit. Five additional monitoring wells are owned by the Mendota/Firebaugh Irrigation District. Some or all of the wells were constructed to help quantify selenium levels in groundwater flowing toward adjacent properties. If sufficient data cannot be obtained regarding the water quality in the wells, then groundwater sampling and analysis will need to be conducted.

- **Septic Systems.** Septic systems are likely present on each parcel with a residence. It is unlikely that disposal of significant quantities of hazardous materials occurred in the septic systems.

PVWMA recently conducted a Phase II Environmental Assessment (Phase II) per recommendations provided in the Phase I recommendations. Conclusions provided in the Phase II correspond to the Phase I findings outlined in the Draft EIR.

Pertinent regulations governing hazardous materials and substances in the BWD originate at both the federal and state level, but are primarily implemented and enforced at the local or regional level. Most hazardous materials regulation and enforcement in the County of Fresno is managed by the Fresno County Environmental Health Department which defers large cases of hazardous materials contamination or violations to the Central Valley Regional Water Quality Control Board (RWQCB) and the California Department of Toxic Substances Control (DTSC). However, it is not at all uncommon for other agencies to become involved when issues of hazardous materials arise such as air quality management districts in it permitting of asbestos abatement, and both the federal and state Occupational Safety and Health Administration (OSHA). Hazardous materials remediation plans are primarily intended to protect the health of construction and contamination remediation workers.

3.11 NOISE

Primary noise sources in the BWD include vehicle traffic on local rural roadways, agricultural operations, and small aircraft traveling to and from local landing strips. West Herndon Avenue, West Bullard Avenue, West Shaw Avenue, Ashlan Avenue, North Fairfax Avenue, Jerrold Avenue, Newcomb Avenue, and Douglas Avenue are the primary roadways in the study area. Traffic volumes along these rural roadways are fairly low. However, it is estimated that the percentage of trucks or other slower moving vehicles (e.g., farming vehicles), is heavier than average due to local agricultural uses. Other naturally occurring sources of noise in the project area include wind and birds.

Schools, parks, hospitals, and residential areas are typically defined as noise-sensitive land uses. Within the study area, noise-sensitive land uses include six housing units located near the Northwestern corner of the study area, along North Fairfax Avenue. Because the number of noise-sensitive land uses is fairly low, monitoring of ambient noise conditions was not considered warranted and, as such, have not been conducted for this analysis. Ambient noise levels in a sparsely populated area such as this would be expected to be in the range of 30–40 dBA with higher peak noise levels occurring during planting, harvesting, and aerial site applications.

3.12 SOCIOECONOMICS

3.12.1 POPULATION

Firebaugh, located approximately 5 miles from BWD, with a population of 5,954, is Fresno County's third smallest city. Since 1990, the population of Firebaugh has grown by 34 %, a relative increase somewhat greater than both the county's and the state's population growth during the same period (**Table 3-5**).

TABLE 3-5
POPULATION TRENDS IN FIREBAUGH, MENDOTA, AND THE BROADVIEW WATER DISTRICT 1990–2000

Area	1990 Population	2002 Population	Percent Change Population, 1990-2002	Persons per Household, 2002
Fresno County	667,490	826,550	24	3.13
Firebaugh	4,429	5,954	34	4.06
Mendota	6,821	8,055	18	4.37
Broadview Water District[a]	N/A	23	N/A	3.83

a All values for the Broadview Water District were obtained from the U.S. Census Bureau, Census 2000 data on the individual census blocks comprising the District.

SOURCE: California Department of Finance, 2000

The City of Mendota has a population of 8,055. Between 1990 and 2000, Mendota's population expanded by 18 %, an increase on par with growth in California, but somewhat lower than in Fresno County. According to the 2000 census, the BWD has a population of 23 people. As shown above in **Table 3-4**, the average household size (persons per household) is estimated at 4.06 for Firebaugh, 4.37 for Mendota, and 3.83 for the BWD. These densities are slightly higher than the estimations for county (3.13) and state (2.91) households.

3.12.2 ETHNICITY AND INCOME

Firebaugh's composition is almost entirely Hispanic/Latino (87.5 %) and white (9.8 %). African Americans, Asians, American Indians, and others account for a combined total of less than 3 % of the population. Firebaugh is considered to be racially diverse, with minority populations comprising over 90 % of its total population (U.S. Bureau of the Census, 2000).

Income characteristics compiled during the 2000 census indicate Firebaugh's median household income to be $31,533 (**Table 3-6**). This is somewhat lower than the county rate of $34,725. Families in poverty were estimated at 20 % (250 of 1,251). Individuals living in poverty were

estimated at 22.5 % (1,301 people). These numbers are on par with poverty rates for Fresno County (U.S. Bureau of the Census, 2000).

TABLE 3-6
INCOME AND ETHNICITY DATA FOR FRESNO COUNTY, THE CITY OF FIREBAUGH, AND THE CITY OF MENDOTA, 2000
Ethnic Composition (Percentage)

Area	Median Household Income	Hispanic and/or Latino	White	African American	American Indian	Asian[a]	Others[b]
Fresno County	$34,725	44.0	39.7	5.0	<1	8.0	<1
Firebaugh	$31,533	87.5	9.8	1.1	<1	<1	<1
Mendota	$23,705	94.7	3.1	<1	<1	<1	<1
Broadview Water District	N/A	78.3	21.7	0	0	0	0

a This category combines the percentages in the 2000 census categories "Asian" and "Native Hawaiian and Other Pacific Islander."

b This category combines the percentages in the 2000 census categories "Some other race" and "Two or more races."

SOURCE: U.S. Bureau of the Census, 2000

Mendota's inhabitants are predominantly (95 %) Hispanic and/or Latino (**Table 3-6**). An estimated 3 % of the population is white. Combined, other ethnic groups (African Americans, Asians, American Indians, and others) account for less than 3 % of the population. Mendota is considered to have a substantial ethnic population. Its high percentage of minorities (nearly 97 %) is significantly greater than the county's. Based on a review of the 2000 census data, Mendota, with its substantial Hispanic/Latino population, is considered a minority community.

Income statistics for Mendota compiled during the 2000 census include a median household income of $23,705. This is lower, by more than a third, than median income throughout Fresno County. An estimated 35.5 % of Mendota's families (535 of 1,521) are in poverty along with 41.9 % of individuals (3,278 people). Both these poverty rates are significantly higher than the poverty numbers for Fresno County (U.S. Bureau of the Census, 2000).

2000 census data indicate that the ethnic composition of the Proposed Action/Project area is similar to Firebaugh and Mendota. 78.3 % of the BWD's population is Hispanic and/or Latino; the remaining 21.7 % is white.

3.12.3 HOUSING

Housing characteristics for Fresno County, Firebaugh, Mendota, and the Proposed Action/Project area are shown below in **Table 3-7**. The County's housing vacancy rate as of May 2002, was 5.81 %. Vacancy rates for Firebaugh and Mendota were 10.31 % and 2.8 %, respectively. No vacancies were reported in the Project Area.

TABLE 3-7
HOUSING CHARACTERISTICS FOR FRESNO COUNTY, SELECTED CITIES IN FRESNO COUNTY, AND THE BROADVIEW WATER DISTRICT, 2000

Area	Total Housing Units[a]	Median Value of Owner-Occupied Unit[b]	Median Contract Rent[b]	Percent Vacant[a]
Fresno County	276,440	$104,900	$534	5.81
Firebaugh	1,620	$80,900	$517	10.31
Mendota	1,894	$82,700	$447	2.8
Broadview Water District	6	N/A	N/A	0

a California Department of Finance, 2002
b U.S. Bureau of the Census, 2000

Median contract rents for Firebaugh and Mendota are $517 and $447, respectively. The median value of an owner-occupied unit in Fresno County is $104,900, with median values in Firebaugh and Mendota somewhat lower at $80,900, and 82,700, respectively. Both median contract rents and owner-occupied values for the Project Area are somewhat lower than the California state average.

The BWD contains 6 housing units, at least 2 of which are permanent residences. Of these units, three are owner-occupied and 3 are renter occupied.

3.12.4 EMPLOYMENT

Employment in the BWD study area is limited to seasonal and year-round farm work, and six managerial, administrative, and technical positions associated with operation of the BWD. The BWD study area contains 16 farming sections, seven of which are currently fallow. For the remaining nine sections, the average number of farm workers per section is estimated at two workers per section. Consequently, the study area directly employs approximately 20 farm workers. For the most part, farm workers in the study area do not work exclusively within the BWD. Most workers have additional work in surrounding water districts, and vary their employment seasonally throughout the area (Garric Stuhr, Pers. Comm., Site Visit, 2003). The Broadview COOP Gin, a cotton processing facility, is also located in the study area.

3.13 PUBLIC SERVICES

This section describes existing public services within the BWD. This discussion is based on a review of the Fresno County General Plan, and telephone communications with staff from public works agencies and public services providers.

3.13.1 FIRE AND EMERGENCY MEDICAL SERVICE PROTECTION

Fire Protection services in the Project Area are provided by the Fresno County Fire Protection District (FCFPD). Fire Station 96 is located in Mendota, roughly 13 miles away from the northwestern corner of the BWD. Average response time to the intersection of North Fairfax Road and Herndon Avenue is approximately 12 minutes (Casey Craig pers. comm., 2003). FCFPD's standard deployment for a fire incident in the Project Area consists of 4 engines and 2 tenders. Each tender has a 300,000 gallon capacity; fire-fighting units bring all necessary water with them and do not rely on site-specific water supplies (FCFPD, 2003). In addition to fire protection, the FCFPD provides emergency medical services throughout its service area.

3.13.2 LAW ENFORCEMENT

Law enforcement services for unincorporated areas of Fresno County are provided by the Fresno County Sheriff's Department. The Sheriff's Department currently has 329 sworn officers serving the unincorporated population of Fresno County (301,200), for a ratio of 1.09 officers per 1,000 residents (Fresno County, 2000b). The BWD is located in the Sheriff's Department Southwest Field Services Bureau, in Area 1.

3.13.3 SCHOOLS

Two school districts, Firebaugh-Las Deltas Joint Unified School District and Dos Palos Oro Loma Joint Unified School District, provide public education for children living in the BWD. Combined, the districts support five elementary schools, three middle schools, four high schools and no charter schools. Continuing and adult education opportunities are available through the Firebaugh-Las Deltas Adult Education Center located in Firebaugh.

3.13.4 PARKS AND RECREATION

No known public recreational facilities or parks are located within the BWD. Recreational opportunities in western Fresno County are relatively undeveloped compared with eastern Fresno County which benefits from a well established network of State and National Parks and National Forests. The Fresno County General Plan highlights the goal of improving existing resources, stating "The County shall encourage the development of recreation facilities in western Fresno County" (Fresno County, 2000, Policy OS-H.14).

Recreational facilities in the vicinity of the Proposed Action/Project area include several city parks in Firebaugh and Mendota, county and state administered parklands, and city sports and

activity programs (Fresno Economic Development Corporation, 2003). The nearby Mendota Wildlife Area, and Los Banos Grasslands Complex, provide hunting, fishing, and additional outdoor opportunities. The Millerton State Recreation Area is located approximately 50 miles to the northeast of the BWD, and the Merced National Wildlife refuge approximately 45 miles to the northwest.

3.13.5 OTHER LOCAL PUBLIC FACILITIES AND SERVICES

Emergency services for all of Fresno County, including the BWD area, are provided by American Ambulance. American Ambulance provides a variety of emergency and health-related services, including but not limited to: EMS dispatch, advance and basic life support ambulances, special trauma units, and airlifts. The closest definitive care facilities to the Project Area are hospitals in Los Banos (approximately 20 miles) and Fresno (approximately 45 miles).

Gas and electrical service in the Project Area is provided by Pacific Gas and Electric. Library Services are available through the San Joaquin Valley Library System and the Fresno County Library System.

3.14 TRANSPORTATION/TRAFFIC

Regional access to the BWD is provided from Interstate 5 or State Route 33 via Nees Avenue. West Herndon Avenue, West Bullard Avenue, West Shaw Avenue, Ashlan Avenue, North Fairfax Avenue, Jerrold Avenue, Newcomb Avenue, and Douglas Avenue are the primary roadways in the BWD. Traffic volumes along these rural roadways are fairly low, with most roadways carrying fewer than 3,000 vehicles per day and operating at LOS A or B. Based on the heavy agricultural usage of the project area, the percentage of trucks and other slow moving vehicles (e.g., farming vehicles) tends to be greater than average.

Two small airstrips, the Bullard Avenue and Douglas Avenue Airstrips, are located within the BWD study area. Both airstrips are primarily used for crop dusting activities.

3.15 UTILITIES AND SERVICE SYSTEMS

3.15.1 LOCAL UTILITY AND SERVICE SYSTEMS

The BWD is located in unincorporated Fresno County, where no municipal water distribution, water supply or wastewater removal and treatment services, are available. The Westlands Water District provides the BWD with approximately 23 acre/feet of CVP water a year which is then treated and distributed as potable water by the BWD. Although monitoring and pumping wells are scattered throughout the District, the water from these wells is solely for agricultural use. No drinking water wells are located within the Project Area. Wastewater in the Project Area is treated in local septic systems. These systems are owned and maintained privately, and are not connected to any larger wastewater treatment facilities.

Problems with stormwater and runoff are nominal throughout the Project Area. Unpaved, arable soils minimize runoff and pooling, and there are no designated storm water drainage facilities located in the vicinity of the Project Area. Silver Creek, which runs adjacent to the southeast corner of the BWD, has been known to flood historically. In instances of severe flooding, water from Silver Creek can be diverted into the BWD's Main Drain located along the southern boarder of the BWD.

Solid waste pick up and disposal for the BWD area is provided by the Firebaugh Disposal Service. Residential and commercial solid waste is disposed of at the American Avenue landfill in Kerman, CA. As of January 1997, the landfill is at eight percent of capacity with a life expectancy of approximately 32–40 years (Fresno County, 2000). During ESA's site reconnaissance, small quantities of solid waste (household trash and appliances) were observed to be have been disposed of improperly along roads and ditches within the District.

3.15.2 FEDERAL CENTRAL VALLEY PROJECT

SAN LUIS UNIT

The San Luis Unit, a part of the CVP and also part of the State of California Water Plan, was authorized in 1960. Reclamation and the State of California constructed and operates this unit jointly. Some features are "joint-use facilities" of the Federal Government and the State. The principal purpose of the Federal portion of the facilities is to furnish approximately 1.25 million acre-feet of water as a supplemental irrigation supply to some 600,000 acres located in the western portion of Fresno, Kings, and Merced Counties.

The major portion of the San Luis Unit is a combined effort of the Federal and State governments; 55 percent of the total cost is contributed by the State of California and the remaining 45 percent by the United States (U.S. Bureau of Reclamation, 2003). The joint-use facilities are O'Neill Dam and Forebay, B. F. Sisk San Luis Dam, San Luis Reservoir, William R. Gianelli Pumping-Generating Plant, Dos Amigos Pumping Plant, Los Banos and Little Panoche

Reservoirs, and San Luis Canal from O'Neill Forebay to Kettleman City, together with the necessary switchyard facilities.

The Federal-only portion of the San Luis Unit includes the O'Neill Pumping Plant and Intake Canal, Coalinga Canal, Pleasant Valley Pumping Plant, and the San Luis Drain.

San Luis Reservoir serves as the major storage reservoir and O'Neill Forebay acts as an equalizing basin for the upper stage dual-purpose pumping-generating plant. Pumps located at the base of O'Neill Dam take water from the Delta-Mendota Canal through an intake channel (a Federal feature) and discharge it into the O'Neill Forebay (U.S. Bureau of Reclamation, 2003). The California Aqueduct (a State feature) flows directly into O'Neill Forebay. The pumping-generating units lift the water from the O'Neill Forebay and discharge it into the main reservoir. When not pumping, these units generate electric power by reversing flow through the turbines. Water for irrigation is released into the San Luis Canal and flows by gravity to Dos Amigos Pumping Plant where it is lifted more than 100 feet to permit gravity flow to its terminus at Kettleman City (U.S. Bureau of Reclamation, 2003). A State canal system continues to southern coastal areas. During irrigation months, water from the California Aqueduct flows through the O'Neill Forebay into the San Luis Canal instead of being pumped into the San Luis Reservoir. Two detention reservoirs, Los Banos and Little Panoche control cross drainage along the San Luis Canal. The reservoirs also provide recreation and flood control benefits.

Plans to build the San Luis Drain to dispose of agricultural drainage on the west side of the San Joaquin Valley did not materialize, allowing the drainage to accumulate at Kesterson Reservoir.

B. F. Sisk Dam and Reservoir

These joint Federal/State facilities are located on San Luis Creek near Los Banos, California. Completed in 1967 and dedicated on April 20 of that year, B. F. Sisk Dam is a zoned earthfill structure 382 feet high with a crest length of 18,600 feet; it contains 77,656,000 cubic yards of material. The dam's crest is 30 feet thick; the maximum base width is 2,420 feet. In the United States, only the U.S. Army Corps of Engineers' Fort Peck and Oahe Dams along the Missouri River Basin carry greater mass. (U.S. Bureau of Reclamation, 2003)

Five layers, or zones, of material make up the B. F. Sisk Dam. The core of the embankment, Zone 1, consists of 41 million yards of clay, silt, sand, and gravel. Twelve passes by tamping rollers compacted the conglomeration into six inch layers. Zone 2 comprises sand, gravel, and cobbles compacted to 12-inch layers. Shale, sandstone, conglomerate fragments, clay, silt, sand, and gravel tamped by rollers into 12-inch layers form Zone 3. Zone 4 is made up of rock fragments ranging between 3/16 inch and 8 inches compacted by a crawler-type tractor in 12-inch layers. The outside surface, Zone 5, is more than 3 million cubic yards of rock fragments ranging from 8 to 36 inches, taken from nearby Basalt Hill. Work on San Luis Dam concluded two months ahead of schedule, in August 1967. (U.S. Bureau of Reclamation, 2003)

The reservoir has a capacity of 2,041,000 acre-feet and is used to store surplus water of the Sacramento-San Joaquin Delta (U.S. Bureau of Reclamation, 2003). Releases are made through the San Luis Pumping-Generating Plant, using its power generating capacity. The lake filled for the first time on May 31, 1969. The reservoir offers facilities for fishing, boating, water skiing, and camping.

B. F. Sisk Dam is near two seismic faults. It is twenty-eight miles from the San Andreas Rift, and 23 miles from the Calaveras-Hayward Faults. Designed to withstand the effects of an earthquake comparable to the one that leveled San Francisco in 1906, the dam's core material is resistant to progressive erosion and its appurtenant structures were built on a firm rock foundation.

A hydraulic junction point for both Federal and State waters, the B. F. Sisk Reservoir serves as a forebay for the Gianelli Pumping-Generating Plant. The dam's spillway incorporates an ungated morning-glory hole, shaft, conduit, chute, stilling basin, and riprap-lined channel. The spillway functions as a safety device to release any excess storage. Excess is a consequence of flooding when the reservoir is at normal water surface elevation or continued pumping after the reservoir fills. The entire inflow design flood of 24,500 acre-feet can be stored in two feet of excess reserve in the reservoir. (U.S. Bureau of Reclamation, 2003)

After a reservoir drawdown in 1981, 400,000 cubic yards of embankment slid down 177 feet along a 1,100 foot section near the crest of the dam. On September 15, a State maintenance crew first discovered movement on a hill butted against the dam. Three days later, rocks and dirt continued to creep down the dam's face. Reclamation's Mid-Pacific Regional Director, Mike Catino, described the potential of a disaster at San Luis as "a one in five chance of happening." Repairs, completed in August 1982 required 1.4 million cubic yards of select material to stabilize the embankment. Reclamation moved quickly, and "not one acre-foot of water was lost to the farmers." On July 30, 1984, a crack opened along the embankment, parallel to the dam's centerline, but it eventually stopped of its own accord. No other movement or cracks have been reported at the dam since 1984. (U.S. Bureau of Reclamation, 2003)

O'Neill Dam and Forebay

The O'Neill Dam and Forebay are joint Federal/State facilities located on San Luis Creek, 2.5 miles downstream from San Luis Dam. O'Neill Dam, completed in 1967, is a zoned earthfill structure with a height of 87 feet and a crest length of 14,300 feet. It contains 2.8 million cubic yards of material and was completed in 1967. The top 20,000 acre-feet act as re-regulator storage necessary to permit off-peak pumping and on-peak generation by the main San Luis Pumping-Generating Plant.

The O'Neill Forebay Inlet Channel extends 2,200 feet from the Delta-Mendota Canal to deliver water to the O'Neill Forebay. The forebay holds 56,000 acre-feet, part of which is used for regulator storage to permit off-peak pumping and on-peak generation. Six pumping units of the O'Neill Pumping-Generating Plant lift water 45 to 53 feet into the forebay. The forebay, with a capacity of 56,400 acre-feet, is used as a hydraulic junction point for Federal and State waters.

Recreation facilities included at the forebay for picnicking, camping, swimming, boating, water skiing, and fishing. (U.S. Bureau of Reclamation, 2003)

O'Neill Pumping Plant

This Federal facility consists of an intake channel leading off the Delta-Mendota Canal, 70 miles from the Tracy Pumping Plant, and six pumping-generating units. The plant was under construction from 1964 to 1967. These units operate as pumps to lift water from 45 to 53 feet into the O'Neill Forebay. When water is occasionally released from the forebay to the Delta-Mendota Canal, these units operate as generators. When operating as pumps and motors, each unit can discharge 700 cubic feet per second (cfs) and has a rating of 6,000 horsepower. When operating as turbines and generators, each unit has a generating capacity of about 4,200 kilowatts. (U.S. Bureau of Reclamation, 2003)

William R. Gianelli Pumping-Generating Plant

This joint Federal/State facility, located flush against the San Luis Dam, lifts water by pump-turbines from the O'Neill Forebay into San Luis Reservoir. During the irrigation season, water is released from San Luis Reservoir back through the pump-turbines to the forebay, and energy is reclaimed. Each of the eight pumping-generating units uses 63,000 horsepower when pumping or will develop 53000 kilowatts when generating. As a pumping station to fill San Luis Reservoir, each unit lifts 1,375 cfs at 290 feet total head. As a generating plant, each unit passes 1,640 cfs at the same head. It became California's largest hydroelectric plant at its completion in 1967. (U.S. Bureau of Reclamation, 2003)

San Luis Canal

This joint Federal/State facility is a concrete-lined canal with a capacity ranging from 8,350 to 13,100 cfs. Public access sites are provided for fishing. The San Luis Canal is the biggest earth-moving project in Reclamation history. It is the federally-built and operated section of the California Aqueduct and extends 102.5 miles from the O'Neill Forebay, near Los Banos, in a southeasterly direction to a point west of Kettleman City (U.S. Bureau of Reclamation, 2003). The 138-foot-wide channel is 36 feet deep, 40 feet wide at the bottom, and lined with concrete.

The first release of water from the O'Neill Forebay to the initial reach of the canal was on April 13, 1967. Water was pumped from Dos Amigos Pumping Plant into the second reach in October of that year, and by December, water reached Kettleman City at the end of Reclamation's canal. At that point, the conduit becomes the State's California Aqueduct.

Dos Amigos Pumping Plant

This joint Federal/State facility, 17 miles south of the Forebay, is a relift plant in the San Luis Canal. The plant contains six pumping units, each capable of delivering 2,200 cfs at 125 feet of head. (U.S. Bureau of Reclamation, 2003)

Pleasant Valley Pumping Plant

Pleasant Valley Pumping plant is a Reclamation facility which pumps water into the Coalinga Canal. Westlands Water District operates and maintains this pumping plant. This Federal facility lifts water 180 feet from an intake channel leading from the San Luis Canal at mile 74. Three 7,000-, three 3,500-, and three 1,250-horsepower units are used to deliver 1,135 cubic feet of water per second to the Coalinga Canal and 50 cubic feet of water per second to a distribution lateral serving adjacent lands north of the pumping plant. (U.S. Bureau of Reclamation, 2003)

Coalinga Canal

This Federal facility, formerly called Pleasant Valley Canal, carries water from the turnout structure on the San Luis Canal to the Coalinga area, in Fresno County. The system includes a 1.6-mile intake channel to the Pleasant Valley Pumping Plant and 11.6 miles of canal. The initial capacity of the canal is 1,100 cfs, decreasing to 425 cfs at the terminus. Reaches 1 and 2 of the canal are operated by the Westlands. (U.S. Bureau of Reclamation, 2003)

Los Banos and Little Panoche Detention Dams and Reservoirs

Los Banos and Little Panoche Detention Dams are southwest of the town of Los Banos on Los Banos and Little Panoche Creeks. These joint Federal/State facilities are required to protect the San Luis Canal by controlling flows of streams crossing the canal. Los Banos Reservoir has a capacity of 34,600 acre-feet. It protects the city of Los Banos and adjacent areas from damaging floods and provides recreation facilities for picnicking, camping, swimming, fishing, and boating. Little Panoche Reservoir detains floodwater collected over 81.3 square miles of mountainous drainage area and provides limited recreation facilities. Both are zoned earthfill detention dams. Los Banos Detention Dam, completed in 1965, is 167 feet high with a 1,370-foot-long crest. It provides 34,500 acre-feet of flood control capacity with a maximum controlled release of 1,000 cfs. (U.S. Bureau of Reclamation, 2003)

Little Panoche Detention Dam, completed in 1966, contains a little more than a million yards of earthfill in its 151-foot-high embankment. The dam's crest is 1,440 feet long and 30 feet wide. The reservoir's capacity is 5,580 acre-feet. (U.S. Bureau of Reclamation, 2003)

San Luis Drain and Kesterson Reservoir

The San Luis Drain, a Federal facility, is designed to convey and dispose of subsurface irrigation return flows from the San Luis service area. Construction began in April 1968. The drain was designed to collect subsurface drainage from 8,000 acres in the San Luis service area, and transport the water for disposal in the west Delta. The design capacity was 300 cfs. (U.S. Bureau of Reclamation, 2003)

Of the planned 188 miles of drain, 87 miles were completed; construction was halted in 1975 because of mounting costs and concerns about the quality of the agricultural drainage that would go into the Delta.

The concrete lined canal ran from the town of Five Points to a series of twelve shallow ponds formed by earthen dikes. Kesterson Reservoir is a collection of ponds outside the town of Gustine, in Merced County, where water was ponded, regulated, and allowed to evaporate pending approval and construction of an outlet for the San Luis Drain. The reservoir served in the conservation and management of wildlife and recreation and was designated as a national wildlife refuge.

SAN FELIPE DIVISION

The San Felipe Division of the Central Valley Project, in the central coastal area of California, embraces the Santa Clara Valley in Santa Clara County, the northern portion of San Benito County, the southern portion of Santa Cruz County, and the northern edge of Monterey county. Authorized in 1960, the division provides supplemental water to 63,500 acres of land, in addition to 132,400 acre-feet of water annually for municipal and industrial use. Water from San Luis Reservoir is transported to the Santa Clara-San Benito service area through Pacheco Tunnel and other project features, which include 48.5 miles of closed conduits, two pumping plants, and one small reservoir. Provisions for future construction of about 25 miles of closed conduit to Santa Cruz and Monterey counties are included in the division features. (U.S. Bureau of Reclamation, 2003)

Water is conveyed from the Delta of the San Joaquin and Sacramento Rivers through the Delta-Mendota Canal to O'Neill Forebay. The water is then be pumped into San Luis Reservoir and diverted through the 1.8 miles of Pacheco Tunnel Reach 1 to the Pacheco Pumping Plant. At the pumping plant, the water is lifted to the 5.3-mile-long high-level section of Pacheco Tunnel Reach 2 (U.S. Bureau of Reclamation, 2003). The water flows through the tunnel and, without additional pumping, through the Pacheco Conduit to the bifurcation of the Santa Clara and Hollister Conduits. The water is then conveyed throughout the service areas for irrigation and municipal uses.

3.16 ENVIRONMENTAL JUSTICE

On February 11, 1994, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." The executive order's purpose is to avoid the disproportionate placement of any adverse environmental, economic, social, or health effects resulting from federal actions and policies on minority and low-income populations. By memorandum on February 11, 1994, the president directed the EPA to ensure that agencies analyze the environmental effects on minorities and low-income populations and communities, including human health, social, and economic effects.

The EPA defines environmental justice as: "The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means no group of people, including racial, ethnic, or economic groups should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies (EPA, 1998).

The majority of residents within the study area are considered Hispanic and/or Latino. Census data (2000), outlined in Section 3.12, indicate that the ethnic composition of the study area is similar to the surrounding communities of Firebaugh and Mendota, with 78.3 percent of the population considered Hispanic and 21.7 percent white. Income characteristics for both communities indicate that median household incomes are lower (more than 1/3 lower in Mendota) than Fresno County as a whole. Likewise the poverty rates for both Firebaugh and Mendota are substantially higher as compared to County averages.

3.17 INDIAN TRUST ASSETS

Indian Trust Assets (ITAs) are legal interests and property held in trust by the United States for Indian tribes or individuals, or property that the United States is charged by law to protect for Indian tribes or individuals. All federal bureaus and agencies share a duty to act responsibly to protect and maintain ITAs. A review of Reclamation's Geographic Information System for ITAs (Indian reservations, rancherias, or public domain allotments) within BWD revealed that there are no ITAs within BWD.

CHAPTER 4.0
ENVIRONMENTAL CONSEQUENCES

CHAPTER 4.0
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter describes the environmental consequences of implementing the Proposed Action and No Action Alternatives as described in Chapter 2.0. Changes to the natural and human environment that would result from the Proposed Action and No Action Alternatives were evaluated relative to the existing environmental conditions within the Broadview Water District (BWD) as described in Chapter 3.0. For the purposes of this environmental assessment (EA), the No Action Alternative would result in a general continuation of existing environmental conditions as outlined in Chapter 3.0.

This chapter also provides an assessment of potential cumulative effects resulting from the implementation of the Proposed Action Alternative and No Action Alternative in combination with other projects or conditions, and indicates the severity of impacts and their likelihood of occurrence. Cumulative impacts would be considered significant if the Proposed Action Alternative and the No Action Alternative in combination with other projects or pre-existing conditions, result in reasonably foreseeable impacts to existing environmental conditions as described in Chapter 3.0.

4.1.1 APPROACH TO THE ENVIRONMENTAL ANALYSIS

Under the Proposed Action, PVWMA will remove the full 9,200-acre BWD land base from current CVP irrigated agricultural production. That is, no CVP water will be applied to lands within the BWD. For the purposes of this EA, the amount of water analyzed is the entire 27,000 afy of water under the existing BWD CVP contract supply; minus the 23 afy that would remain for local residents pursuant to a contract between Westlands and BWD. This analysis assumes that approximately 9,100 acres of the 9,200 acres of land being purchased will be limited to dry land farming or fallowed agricultural land, which will be regularly disced and managed for weed and insect control (refer to Chapter 2.0 for proposed environmental measures). The approximately 100 acres owned by the BWD will continue to be used for the existing demonstration project, where tile drainage water is used to grow salt tolerant crops. For the purposes of this analysis, any future expansion of this demonstration project is considered remote and speculative.

4.2 WATER RESOURCES

4.2.1 PROPOSED ACTION ALTERNATIVE

The Proposed Action would not result in any significant impacts to water quality on any surface water body including local streams, rivers, lakes, or bays. In fact, the Proposed Action would reduce the quantity of drainage water currently being discharged from the BWD to the San Joaquin River by approximately 2,600 acre-feet or 70 percent of water per year (Summers Engineering, 2003). More specifically, by fallowing the BWD lands and not applying CVP water for irrigation, the estimated reduction in drain water discharge from existing conditions (approximately 3,700 afy), will be reduced by approximately 1,100 afy. Most of these resulting flows are likely attributable to sub-surface flows originating from up-gradient locations to the south and west. More importantly, within this reduction of approximately 2,600 afy, it is estimated that there will be substantial reductions in the quantities of salts, selenium, and boron discharged to the San Joaquin River. Using the existing conditions of approximately 6.57 tons of salt, 0.58 pounds of selenium, and 20 pounds of boron per acre-foot of discharged water from BWD to the San Joaquin River, the Proposed Action would result in the elimination of approximately 17,000 tons of salt, 1,500 pounds of selenium, and 52,000 pounds of boron to the San Joaquin River each year. As the San Joaquin River is listed as an impaired water body and is on the 303(d) list for boron, selenium and electrical conductivity, these reductions provide a desirable benefit to the San Joaquin River. These benefits are summarized in Table 4-1 below.

TABLE 4-1
DRAINAGE AND WATER QUALITY EFFECTS OF PROPOSED ACTION ON THE SAN JOAQUIN RIVER

	Existing Conditions	Under Proposed Action Conditions	Estimated Reduction Attributable to Proposed Action
BWD Drainage to San Joaquin River (afy)	3,700	1,100	2,600
BWD Estimated Salt Production (tons/yr)	24,300	7,300	17,000
BWD Estimated Selenium Production (lbs/yr)	2,140	640	1,500
BWD Estimated Boron Production (lbs/yr)	74,000	22,000	52,000

Source: Summers Engineering, 2003

The Proposed Action would not entail any new development and therefore, no net increase in impervious surfaces is anticipated to occur. The Proposed Action would also involve a net reduction in irrigation water (approximately 16,200 afy) applied to the site. The Proposed Action would not involve the construction of any new facilities that would be prone to flooding, placed within a 100-year flood zone, or impede or redirect flood flows. Consequently, implementation of the Proposed Action would have no significant impacts on existing hydrologic hazards,

fallow their fields and/or sell the CVP water on the open market. These reductions may be further increased by the zero discharge requirements expected from the Regional Board pursuant to existing Water Discharge Requirements. Nonetheless, the No Action Alternative could still complicate efforts by the Grasslands Area Farmers to reduce drain-water discharges to the San Joaquin River.

The No Action Alternative would not result in any substantial alterations to existing drainage patterns within the project area. As such, there is no potential for increased flooding on- and/or off-site and no impact is expected. The No Action Alternative would continue to contribute to poor water quality within the local, shallow groundwater resource, however, not beyond existing environmental conditions.

4.2.2.1 No Action Alternative – Cumulative Impacts

The No Action Alternative would continue to contribute drain-water discharges to the San Joaquin River and dissolved solids to shallow groundwater resources. However, as this situation characterizes existing environmental conditions and no deviation from existing conditions would occur, the No Action Alternative would not contribute to any additional significant cumulative impacts to water resources.

4.3 AESTHETIC RESOURCES

4.3.1 PROPOSED ACTION ALTERNATIVE

Implementation of the Proposed Action Alternative would not adversely impact scenic resources; nor would it result in substantial adverse effects to the visual character of the lands within BWD or surrounding area. As indicated in Chapter 3.0, no scenic vistas have been identified in the vicinity of the Project Area. Under the Proposed Action, lands within BWD would become fallowed. As the lands would be disced twice a year for weed and insect control, the visual character under the Proposed Action would be compatible with the existing agricultural character of the Project Area. Minor variations in the color and texture of the landscape may result as vegetation and crop types change as farmland is fallowed; however, these minor changes are not considered significant.

No designated state or county scenic roadways have been identified in the immediate vicinity of the Project Area. As such, the implementation of the Proposed Action Alternative would not degrade visual resources associated with scenic highways.

The Proposed Action Alternative does not involve any physical changes that would create a new source of substantial light or glare, such that day or night views would be negatively impacted. Substantial changes in light and glare conditions are not anticipated within the Project Area because no significant land use changes or construction have been identified in connection with the Proposed Action. Consequently, no impact would occur.

4.3.1.1 Proposed Action Alternative – Cumulative Impacts

Based on the project-level discussion provided above, the Proposed Action would not contribute to any significant cumulative impacts to visual resources.

4.3.2 NO ACTION ALTERNATIVE

As successful commercial farming becomes increasingly difficult under the No Action Alternative over time, it is expected that some changes in visual quality will occur. Due to deliverability constraints, agricultural market conditions, and drain water quality issues, it is predicted that more and more land within BWD will become fallowed as the more valuable resource, CVP water, will continue to be sold on the open market. Similar to the Proposed Action, the No Action Alternative would likely result in the lands within the BWD eventually becoming fallowed. Some changes in the type and coloration of vegetation associated with current water use patterns are thus expected under the No Action Alternative. However, such changes are expected to be consistent with the overall rural and agricultural character of the landscape. No significant impacts would occur to the visual resources or scenic vistas.

4.3.2.1 No Action Alternative – Cumulative Impacts

The No Action Alternative would not contribute to any significant cumulative impacts to visual resources.

4.4 AGRICULTURE RESOURCES AND LAND USE PLANNING

4.4.1 PROPOSED ACTION ALTERNATIVE

As described in Chapter 3.0, lands within the BWD meet the qualifications for Farmland of Statewide Importance as defined by the California Department of Conservation (DOC) (Mike Cisco per comm., 2003). Even though active farming has occurred within the BWD within the last four years, it is recognized that drainage impairment issues, increasing irrigation water costs and crop-variety limitations will continue to present obstacles for future cultivation. The act of removing irrigation water supplies from the BWD will likely affect the current classification, as irrigation water availability is one of the foremost ranking factors used by the DOC. However, given that no new development (e.g., residential, commercial, etc.) is proposed as part of the Proposed Action Alternative, no direct conversion of Farmland of Statewide Importance would occur, as the land base would still be available for limited agricultural usage.

Implementation of the Proposed Action Alternative does not involve a land use/zoning amendment or introduce alternative land uses such as residential, commercial, municipal, or industrial land uses to the lands within BWD. Under the Proposed Action Alternative, CVP water supplies would be assigned to PVWMA thereby resulting in the permanent loss of water supplies needed to sustain irrigated agriculture within BWD. However, the lands within BWD would remain zoned and available for alternative agricultural land uses such as dry land farming, dairies, or other agricultural or compatible land uses (e.g., 100-acre research plot) using existing drainage water resources, where feasible. At this time, due to costs and other factors, PVWMA plans to keep these lands under fallow or dry-farmed conditions. It is recognized that this management regime would have little affect on the current rural land use pattern and its existing residents.

It is projected that even without the Proposed Action, the lands within BWD will go fallow as the costs associated with drainage water quality issues continues to increase. The projected market conditions for crops that can be grown in BWD will not continue to support sustained or profitable irrigated agricultural practices. To ensure that the lands are compatible with surrounding land uses, weed and pest control measures have been included to minimize these potential nuisance impacts (see Chapter 2.0). With these measures, the land use regime associated with the Proposed Action will be in compliance with all applicable Fresno County land use plans, policies, regulations, and zoning ordinances. Additionally, the Proposed Action will not conflict with the provisions of an existing Williamson Act Contract as no non-renewal or cancellation procedures would occur. Contracts listed in **Appendix A** would continue to provide property tax benefits to the PVWMA following its purchase of lands within the BWD. Consequently, impacts to agricultural zoning and existing Williamson Act Contracts are considered less-than-significant.

4.4.1.1 Proposed Action Alternative – Cumulative Impacts

Based on the project-level impact discussion above, the Proposed Action Alternative would not contribute to significant cumulative impacts to agricultural resources or land use planning

activities. In addition, the agricultural revenue losses to Fresno County would be minimal, as gross revenues attributable to BWD represent a very small fraction of the County's 3.2 billion dollar agricultural industry.

4.4.2 NO ACTION ALTERNATIVE

As described in Chapter 3.0, much of the BWD land base will be classified as Farmland of Statewide Importance during the 2004 California Farmland Mapping and Monitoring Program. Under the No Action Alternative, irrigation farming within the BWD would continue; at least in the short-term. No farmland would be converted to non-agricultural uses. As more fully described in Chapter 2.0, lands within the BWD are difficult to lease out for agricultural activities, which has contributed to increased land fallowing. Land use activities associated with the No Action Alternative would be in compliance with applicable Fresno County land use plans, policies, and regulations. Under the No Action Alternative, current farming activities and operations within the BWD would continue to be compatible with adjacent land uses. Therefore, no impacts are anticipated.

4.4.2.1 No Action Alternative – Cumulative Impacts

The No Action Alternative would not contribute to any significant cumulative impacts to agricultural resources and/or local or regional land use planning.

4.5 AIR QUALITY

4.5.1 PROPOSED ACTION ALTERNATIVE

The Proposed Action Alternative involves the assignment of BWD's water service contract to PVWMA that will ultimately result in removing approximately 9,200 acres within BWD from irrigated agricultural activities. These activities and their associated traffic volumes would be similar in magnitude to those currently occurring in the study area, but would occur with less frequency as compared to existing conditions. PVWMA is in escrow to purchase the lands and is currently preparing an EIR to analyze the Proposed Action under CEQA. PVWMA will be responsible for maintaining these lands to control weeds and insects following the closing of escrow. Consequently, the Proposed Action would be consistent with the existing land use regime and would not conflict with or obstruct implementation of any applicable air quality regulation, plan, or policy.

As described above, the Proposed Action would likely result in less agricultural emissions due to an overall reduction in management intensity within the BWD. Management operations would include weed and pest abatement practices on a semi-annual basis. This form of land management would entail the reincorporation of plant residues back into the ground rather than removing them as with traditional harvesting practices. As a result, the Proposed Action will likely result in a net increase in ground cover over that of existing conditions. It is well documented that the presence of groundcover (e.g., plant residue) helps to maintain soil aggregate stability, thereby reducing the soil surface's susceptibility to wind erosion. In addition, the Proposed Action will not affect existing traffic patterns and may actually result in a net decrease from existing conditions. Based on the above, the Proposed Action would not violate any applicable air quality standard (e.g., PM10), or contribute to an existing air quality violation, and no impact is expected.

Approximately 23 people live within the BWD service area. These individuals are not considered sensitive receptors, as these residents are well adapted to the agricultural environment. These people either work for BWD or are involved in local agricultural practices. Under the Proposed Action, BWD will continue to exist and will be responsible for maintaining the lands for weed and insect control. These activities will be similar to existing activities with less frequency and will not expose individuals to significant pollutant concentrations.

Implementation of the Proposed Action would not increase the use, spreading, or storage of materials (e.g., fertilizers), or increase the rate of existing activities such as prescribed burns that would generate objectionable odors in the study area. It is anticipated that the frequency of those activities would decrease once irrigated agriculture operations within the BWD have terminated. Consequently, the Proposed Action will not generate any additional objectionable odors that could significantly impact sensitive receptors, such as residential areas.

4.5.1.1 Proposed Action Alternative – Cumulative Impacts

Based on the above project-level discussion, the Proposed Action would not contribute to significant cumulative impacts resulting from a net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

4.5.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the CVP contract assignment to PVWMA for up to 27,000 afy would not be implemented. Currently, lands within the project site are farmed, although approximately one-third of the 9,200 acres (approximately 3,100 acres) has been fallowed over the past several years. Current trends in local traffic patterns, volumes, and the use of farming equipment are expected to continue within the BWD and surrounding area, with minimal changes to local and regional air quality conditions anticipated. As such, the No Action Alternative will not conflict with or obstruct implementation of the applicable air quality plan; nor would it violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Implementation of the No Action Alternative would not increase the existing use, spreading, or storage of materials (e.g., fertilizers), or increase the rate of existing activities such as prescribed burns that would generate objectionable odors in the study area.

4.5.2.1 No Action Alternative – Cumulative Impacts

The No Action Alternative will not contribute to a significant cumulative air quality impact, as current trends in local traffic patterns, volumes, and the use of farming equipment are expected to continue within the BWD and surrounding areas, with minimal changes to local and regional air quality conditions anticipated.

4.6 BIOLOGICAL RESOURCES

4.6.1 PROPOSED ACTION ALTERNATIVE

As described in Chapter 3.0, BWD is managed for agricultural purposes and only supports limited habitat for most Special Status Species. Chapter 2.0 presents several environmental measures included in the Proposed Action. Through the implementation of these measures, no substantial changes to the drains or drain-associated vegetation is predicted to occur. Annual crops will be replaced by dryland crops or ruderal vegetation, but the disking regime will ensure that the structural function of fallowed agricultural land will be consistent with existing conditions.

Of the species presented in Appendix B, the following state or federally listed Endangered, Threatened, Candidate, or Proposed species have a potential to occur within the BWD:

- Swainson's hawk
- mountain plover
- San Joaquin antelope squirrel
- giant kangaroo rat
- Fresno kangaroo rat
- San Joaquin kit fox
- blunt-nosed leopard lizard
- giant garter snake

Of the species presented in Appendix C, the following additional Special Status species have a potential to occur within the BWD:

- burrowing owl
- ferruginous hawk
- white-tailed kite
- loggerhead shrike
- short-nosed kangaroo rat
- Yuma myotis bat
- Tulare grasshopper mouse
- San Joaquin pocket mouse
- silvery legless lizard
- San Joaquin coachwhip
- California horned lizard
- heartscale
- brittlescale
- lesser saltscale
- Lost Hills crownscale
- recurved larkspur
- Munz's tidy-tips
- Panoche pepper-grass
- Sanford's arrowhead

As described in Appendix B, the majority of the species listed above, if they occur in the BWD, would occur in association with upland areas adjacent to the drains. This is due to the lower frequency of disturbance in the drains as compared to the agricultural fields, which are regularly disked. Several species may use the agricultural fields for foraging, including: Swainson's hawk, San Joaquin kit fox, burrowing owl, ferruginous hawk, mountain plover, white-tailed kite, prairie falcon, and loggerhead shrike. Vegetation structure is an important determinant of whether visual foragers, such as the species listed here, will be able to forage effectively on a given piece of land. Fish species (delta smelt, Central Valley steelhead, Sacramento splittail, and longfin smelt) and giant garter snake may occur downstream of BWD in Mud Slough or the San Joaquin River. Giant garter snake is not likely to rely on resources within the BWD due to very limited emergent aquatic vegetation and upland refuge habitat. Few opportunities exist for giant garter snake to

disperse into the BWD as irrigation water is delivered to the BWD and drain water is removed from BWD via pipelines, not open canals.

As described in Chapter 2.0, the PVWMA has proposed several environmental measures as part of the Proposed Action to minimize adverse impacts to biological resources. These measures include discing fields twice a year, timed to coincide with the existing planting and harvesting agricultural practices. While annual crops will be replaced by dryland crops or ruderal vegetation, the disking regime will ensure that the structural function of fallowed agricultural land will be consistent with existing conditions. Species which forage on fields will continue to be able to forage on these lands within the BWD under the Proposed Action. Therefore, the Proposed Action is not expected to adversely affect special status species (e.g., Swainson's hawk, San Joaquin kit fox, burrowing owl, ferruginous hawk, mountain plover, white-tailed kite, prairie falcon, and loggerhead shrike) that may rely on agricultural fields for foraging.

Although irrigated agriculture would be discontinued within the BWD, under-land flow of groundwater from up-gradient locations would still contribute to drain water within BWD drainage canals. Therefore, for the purposes of this analysis, no substantial changes to the drains or drain-associated vegetation is predicted to occur. For this reason, the Proposed Action is not likely to adversely affect special status species (e.g., Sanford's arrowhead) that may rely on drains or drain water.

As described in Section 4.1, the Proposed Action would have desirable benefits to the San Joaquin River, in terms of improved water quality, by reducing the quantity of drainage water discharged from the BWD and by substantially reducing salts, selenium, and boron being discharged through Mud Slough to the San Joaquin River. Therefore, the Proposed Action is not likely to adversely affect aquatic wildlife in Mud Slough or the San Joaquin River (e.g., giant garter snake, delta smelt, Central Valley steelhead and other sensitive fish species).

If the concentration of selenium in the surface soils were to increase in the BWD as a result of the upward migration of selenium[1] following the removal of irrigation, selenium toxicity in wildlife could become a problem as a result of bioaccumulation in local vegetation. Section 4.8 describes how a declining groundwater table, following the removal of irrigation, would counteract the upward migration of salinity and decrease the likelihood for significant accumulation of minerals (e.g., selenium and boron) in the root zone, thus reducing the risk of exposure to wildlife. This scenario is supported by the evaluation of the 1990 Drainage Management Plan for the Westside San Joaquin Valley (SJVDP, 2000). Since the Proposed Action is not likely to increase the risk to wildlife from selenium exposure, its implementation is not likely to adversely affect terrestrial wildlife.

The Proposed Action Alternative will not have an adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. This conclusion is based on the fact that no known delineated wetlands exist within BWD and

[1] The movement of selenium within a given soil column is similar to that of sodium.

therefore, none would be affected by the Proposed Action. Consequently, no impacts to these resources would occur.

The Proposed Action Alternative would not interfere substantially with the movement of any native resident or migratory fish or wildlife corridors, or impede the use of native wildlife nursery sites. San Joaquin kit fox may transit through the BWD, but under the Proposed Action, the structure of the vegetation in the BWD should remain the same, and existing San Joaquin kit fox movement habits in the BWD should not change.

The Proposed Action would reduce the amount of drainage flow BWD contributes to the San Joaquin River. BWD is one of several water districts in the Grasslands Watershed that discharges drain water into the San Luis Drain, which drains to Mud Slough (north), a tributary of the San Joaquin River. The Grasslands Watershed comprises approximately 97,400 acres, of which BWD contributes 9,200 acres, or approximately 9.5 %. Assuming that BWD thus contributes approximately 9.5 % of the drain water discharged to Mud Slough, and that drain water from BWD would be reduced by 70 % (Table 4-1); total discharge to Mud Slough would be reduced by approximately 6.6% as a result of the Proposed Action. This reduction would be accompanied by estimated reductions in dissolved solids including salts, selenium, and boron discharges of 70 % each (Table 4-1). The small reduction in flows to Mud Slough may impact fish in the slough during dry summer and fall months, however, the improved water quality is likely to outweigh any such negative effects. As a result, no adverse impacts to aquatic resources in Mud Slough or the San Joaquin River would occur through the implementation of the Proposed Action.

The Proposed Action would not result in impacts to riparian habitats or other sensitive natural communities identified in local or regional plans. Riparian vegetation within BWD is routinely disturbed by mechanical means. Specifically, weeds are disked or sprayed on the inside drain channel prism on a regular basis and thedrains are cleaned with an excavator to remove silt and brush as needed. In addition, riparian vegetation is burned every 3-5 years r as needed. This management regime would not change under the Proposed Action. No formal Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan has been adopted lands for within the BWD. For these reasons, the Proposed Action Alternative does not include any actions that would conflict with any local, state or federal policies or regulations adopted for the purpose of protecting biological resources.

4.6.1.1 Proposed Action Alternative – Cumulative Impacts

Findings provided in the above project-level analysis indicate that the Proposed Action Alternative would not result in significant impacts to biological resources. Given that no significant project-level impact would occur, it is reasonable to conclude that the Proposed Action would not contribute to any significant cumulative biological resources impact.

4.6.2 NO ACTION ALTERNATIVE

As described in Chapter 3.0, BWD is managed for agricultural purposes and only supports limited habitat for most Special Status Species. The No Action Alternative does not include the environmental measures of the Proposed Action. Therefore, for the purposes of this analysis, the following changes to the BWD may occur: land will continue to be fallowed without subsequent management commitments; tile drains will be maintained, and some amount of water will continue to be pumped into the drains, however there will be no measure to ensure adequate water to maintain existing levels of vegetation; annual crops will be replaced by ruderal vegetation, which in the absence of ensured disking may remain standing year-round. The application of drain water or shallow ground water to salt-tolerant crops, may occur without additional environmental review.

Of the species presented in Appendix B, the following state or federally listed Endangered, Threatened, Candidate, or Proposed species have a potential to occur within the BWD:

- Swainson's hawk
- mountain plover
- San Joaquin antelope squirrel
- giant kangaroo rat
- Fresno kangaroo rat
- San Joaquin kit fox
- blunt-nosed leopard lizard
- giant garter snake

Of the species presented in Appendix C, the following additional Special Status species have a potential to occur within the BWD:

- burrowing owl
- ferruginous hawk
- white-tailed kite
- loggerhead shrike
- short-nosed kangaroo rat
- Yuma myotis bat
- Tulare grasshopper mouse
- San Joaquin pocket mouse
- silvery legless lizard
- San Joaquin coachwhip
- California horned lizard
- heartscale
- brittlescale
- lesser saltscale
- Lost Hills crownscale
- recurved larkspur
- Munz's tidy-tips
- Panoche pepper-grass
- Sanford's arrowhead

As described in Appendix B, the majority of the species listed above, if they occur in the BWD, would occur in association with the drains. This is due to the lower frequency of disturbance in the drains as compared to the agricultural fields, which are regularly disked. As described above, the acreage of fallowed of land is expected to continue to increase under the No Action Alternative. Therefore, it is possible that the amount of drain water removed from the fields will substantially decrease, and the suitability of conditions in the drains for drain-associated species would deteriorate. If the amount of disturbance in the fallowed fields (e.g., disking for weed control) decreases, conditions in the fields may improve for burrowing species listed above.

Several species may use the agricultural fields for foraging, including: Swainson's hawk, mountain plover, San Joaquin kit fox, ferruginous hawk, white-tailed kite, and loggerhead shrike.

Under the No Action Alternative, ruderal vegetation may not be regularly disked, and the small mammal prey populations of these predators may increase.

If groundwater levels were allowed to rise such that shallow pools could form on the surface, or if shallow groundwater or drain-water were used for irrigation of land scheduled to become fallow under the No Action Alternative, selenium toxicity could become a problem in the BWD. However, as described in the water resources section (3.1) of this document, groundwater levels are to be maintained at roughly their current depths. If, under the No Action Alternative, additional lands are irrigated with shallow groundwater or drain-water without further environmental review, selenium toxicity could become a problem for wildlife. However, given that the No Action Alternative would result in a continuation of the existing environmental condition, no significant impact would occur.

The No Action Alternative would entail the continued discharge of drainage water from BWD thereby; contributing salts, selenium, and boron through Mud Slough to the San Joaquin River. However, these quantities will likely be reduced in the future as BWD more and more land is fallowed. In addition, further reductions could be expected through the implementation of the measures designed to meet the zero discharge requirements enforced by the Central Valley Regional Water Quality Control Board.

The No Action Alternative will not have an adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. No known federally protected wetlands exist within BWD or would be affected by the Regional Partners Alternative activities. The No Action Alternative does not involve construction activities nor any activities that would affect wetlands resources. No impacts to these resources would occur.

The No Action Alternative would not interfere substantially with the movement of any native resident or migratory fish or wildlife corridors, or impede the use of native wildlife nursery sites. As a result, no significant impacts to these resources would occur through the implementation of the No Action Alternative.

The No Action Alternative would not result in impacts to riparian habitats or other sensitive natural communities identified in local or regional plans. The riparian habitats within BWD are part of the agricultural operations and are maintained by removing vegetation by mechanical means or burning every 3–5 years or as needed. As previously noted, no formal Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan has been adopted for the project area. For these reasons, the No Action Alternative does not include any actions that would conflict with any local, state or federal policies or regulations adopted for the purpose of protecting biological resources.

4.6.2.1 No Action Alternative – Cumulative Impacts

Implementation of the No Action Alternative, would not contribute to significant cumulative impacts to biological resource including terrestrial wildlife, fish populations, wetlands and special status species.

4.7 CULTURAL RESOURCES

4.7.1 PROPOSED ACTION ALTERNATIVE

The Proposed Action will not cause a substantial change in the significance of a historical resource. A records search of all pertinent survey and site data was conducted at the Southern San Joaquin Information Center at California State University, Bakersfield on April 20, 2003. Records that were examined included Information Center maps, recorded site and inventory files, historical maps, Historic Property Data File for Fresno County, the National Register of Historic Places, the California Register of Historic Resources, the California Inventory of Historic Resources (1976), the California Historical Landmarks (1996), and the California Points of Historical Interest (1992). The Fresno County Historical Society was also contacted and asked to provide any information of possible historical sites of interest in the project area. A field inspection of the project area and subsequent NRHP and CRHR evaluation of identified historic period structures determined that no significant historical resources are present in the project area. In addition, the Proposed Action does not include any construction activities that would physically change, damage, or alter any structures. Therefore, the Proposed Action will not have a significant impact on historical resources.

The Proposed Action will not cause a substantial change in the significance of an archaeological resource; nor would it directly or indirectly disrupt a unique paleontological resource or human remains. The records search, attempted contacts with Native Americans, and a field inspection, have resulted in the identification of no archaeological or paleontological resources in the BWD. No formal cemeteries or know human remains are known to exist within the project area. Although the project area has not been intensively inspected for archaeological resources, the area has a very low sensitivity for the presence of archaeological remains on the surface. Any substantial archaeological deposits would likely be deeply buried under alluvium. The project area is uniformly nearly flat, with no natural topographic features of note and no natural water courses. Additionally, because the Proposed Action would not result in ground-disturbing activities, increased erosion, or other activities with the potential to damage or destroy archaeological resources, the Proposed Action would not result in any impacts to these resources.

4.4.1.1 Proposed Action Alternative – Cumulative Impacts

Based on the project-level analysis provided above, the Proposed Action Alternative would not contribute to significant cumulative impacts to cultural resources.

4.7.2 NO ACTION ALTERNATIVE

The No Action Alternative would result in a general continuation of existing conditions. For this reason, no significant impacts would occur to cultural resources.

4.7.2.1 No Action Alternative – Cumulative Impacts

Under the No-Action Alternative, there would be no ground-disturbing activities that could contribute to cumulative archaeological and cultural resource impacts.

4.8 GEOLOGY AND SOILS

4.8.1 PROPOSED ACTION ALTERNATIVE

The Proposed Action would not involve the construction of any new structures that could result in the exposure of people to substantial adverse effects, including the risk of loss, injury, or death involving surface fault rupture, ground shaking, ground failure, differential settlement or landsides. The project area is within a moderate proximity to the San Andreas fault zone located to the west. This fault system could produce significant ground shaking at the project site, should the fault experience significant displacement. However, the project area is located at a sufficient distance from the San Andreas Fault, and potential for damage from surface fault rupture is very unlikely. For these reasons, no impact is expected.

As compared to the No Action Alternative or existing conditions, the Proposed Action will not result in significant soil erosion or the loss of topsoil. Under existing conditions, BWD lands are actively used for irrigated agriculture and are worked for planting and harvesting of crops. Under the Proposed Action, these lands will become fallowed and will be disced twice a year for weed and insect control. This management approach would be less intense as compared to the existing environmental condition, and would allow for the reincorporation of plant residues following discing. Under the existing management operations, harvesting activities remove much of the crop residue off cultivated portions of the BWD, thereby exposing the soil surface to increased erosion potential. Under the Proposed Action, the quantity (density) of groundcover across the BWD would likely experience a net increase, since no crop residue would be exported off-site. Given that the encountered soil types have a moderate erosion potential, the Proposed Action will likely have a beneficial effect in terms of soil erosion and loss of topsoil.

The existing environmental condition for the BWD is characterized by moderate to high levels of salinity (see Table 3-3) and total dissolved solids (salts, selenium, etc.) within the local soil resource. These conditions are attributable to the presence of soluble salts, a high water table, a high rate of evaporation, and low annual rainfall. The excessive accumulation of salts within the soil column in semi-arid landscapes is generally controlled by maintaining a net downward flux of water sufficient to overcome the upward transport of salts.

This said, the removal of irrigation water from lands within the BWD in conjunction within high evapotranspiration[2] rates experienced in the project area, could lead to further accumulation of salts near or at the soil surface as precipitation falls and evaporates. Increases in these constituents in the root zone and at the soil surface could adversely affect the productivity of the soil resource and lead to bioaccumulation within local vegetation. However, these processes are already considered active in the existing environmental condition, given the current trend of land fallowing within the BWD. Given the context of the Proposed Action, the rate of fallowing would be increased with the proposed retirement of lands within the BWD. However, these effects would likely be offset by the lowering of the groundwater table as irrigation practices cease. Given that these process evolve slowly (e.g., decades), the net effect of the Proposed

[2] The combined loss of water from a given area, and during a specified period of time, by evaporation from the soil surface and by transpiration from plants.

Action would not significantly deviate from existing conditions and would not lead to dustbowl-type conditions in the future. For this reason, this impact is not significant.

4.8.1.1 Proposed Action Alternative – Cumulative Impacts

Implementation of the Proposed Action, where BWD lands would be retired from CVP water deliveries for agricultural irrigation, would result in the retirement of lands characterized by impaired drainage, low productivity, and high concentrations of selenium in shallow groundwater. In addition to the Proposed Action Alternative, Westlands Water District also has a land retirement proposal where it is proposing to retire up to 200,000 acres of approximately 250,000 acres of saline and drainage impaired lands. However, this proposal is still being negotiated and the outcome is currently unclear. Given the environmental measures prescribed in Chapter 2.0, the Proposed Action Alternative would not contribute to cumulative impacts in terms of regional soil salinity, which could lead to future dustbowl-type conditions or significant bioaccumulation of naturally-occurring contaminants.

4.8.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, irrigation farming would continue within the BWD with no modification to existing land use proposed. As a result, no appreciable change will occur in the BWD that would substantially increase the severity of geologic hazards to people or structures. Irrigation farming would continue at the site with no change in existing conditions. As a result, no appreciable change will occur at the site that would substantially result in an increase in soil erosion, loss of topsoil or significant toxicity or bioaccumulation of contaminants in the local soil resource.

4.8.2.1 No Action Alternative – Cumulative Impacts

The No Action Alternative will not contribute to a significant cumulative geology or soil resource impact.

4.9 HAZARDS AND HAZARDOUS MATERIALS

4.9.1 PROPOSED ACTION ALTERNATIVE

The Proposed Action consists of the permanent assignment of a water supply contract and will not involve the use, disposal, or transport of hazardous materials. The discing of the fallowed lands for weed and insect control under the Proposed Action will have similar effects as the planting and harvesting operations under existing conditions and the No Action Alternative. Consequently, the Proposed Action will not increase the use, transport, or disposal of any hazardous materials or create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

The Proposed Action will not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. In limited instances aerial application of herbicides or insecticides may be used, but would be less than existing conditions.

Increased land fallowing could result in an increase in the amount of dry, flammable vegetation on fallow agricultural fields. However, these lands will be disced twice a year for weed and insect control. This management regime would eliminate dry brush, grass, and weeds prior to and after fire season. As a result, the Proposed Action would not result in an increased risk of wildfire to the residences located within the BWD.

4.9.1.1 Proposed Action Alternative – Cumulative Impacts

The Proposed Action alternative will not contribute to any significant cumulative hazards or hazardous materials impacts.

4.9.2 NO ACTION ALTERNATIVE

The No Action Alternative would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; nor would it result in a reasonably foreseeable upset involving the release of hazardous materials into the environment.

4.9.2.1 No Action Alternative – Cumulative Impacts

The No Action Alternative would not contribute to significant cumulative hazards or hazardous materials impacts.

4.10 MINERAL RESOURCES

4.10.1 PROPOSED ACTION ALTERNATIVE

The Proposed Action would not impact valuable mineral resources. The Proposed Action would result in the assignment of BWD's CVP water supply contract to PVWMA. Land-use changes under the Proposed Action will involve a shift from irrigated agriculture to fallowed lands or perhaps dry land farming. No mining or mineral extraction is proposed under the Proposed Action as no known mineral resource recovery sites are located within the Project Area. The Proposed Action will not interfere with resource recovery sites as delineated by the Fresno County General Plan.

4.10.1.1 Proposed Action Alternative – Cumulative Impacts

The Proposed Action would not contribute to any significant cumulative impacts to mineral resources.

4.10.2 NO ACTION ALTERNATIVE

Under the No Action Alternative current farming activities and operations within the BWD would continue. Mining and mineral extraction would not occur under this kind of agricultural land use. Implementation of the No Action Alternative will not reduce access to local mineral resource recovery sites, as no known mineral resources or mineral resource extraction operations occur within the BWD.

4.10.2.1 Proposed Action Alternatives – Cumulative Impacts

The No Action Alternative would not contribute to any significant cumulative impacts to mineral resources.

4.11 NOISE

4.11.1 PROPOSED ACTION ALTERNATIVE

Implementation of the Proposed Action is not associated with any construction or operation-related activity that would increase (temporarily or permanently) existing noise or vibration levels in the study area. Implementation of the Proposed Action will result in the conversion of the full 9,200 acres within the BWD from irrigated agriculture to fallowed agricultural land or perhaps dry land farming. Activities and traffic volumes associated with these agricultural activities would likely generate similar noise levels. Open space or less intensive agricultural uses of the study area may actually generate lower noise levels than those currently generated by existing agricultural activities. Therefore, the Proposed Action would not result in significant changes to the existing rural noise environment.

4.11.1.1 Proposed Action Alternative – Cumulative Impacts

Implementation of the Proposed Action Alternative would not contribute to any significant cumulative noise impacts.

4.11.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the CVP contract assignment for up to 27,000 afy would not be implemented. Current trends in local traffic patterns, volumes, and the use of farming equipment are expected to continue within the BWD and surrounding area, with minimal changes to the local noise environment. Therefore, the No Action Alternative will not affect the existing rural noise environment.

4.11.2.1 No Action Alternative – Cumulative Impacts

Implementation of the No Action Alternative would not contribute to any significant cumulative noise impacts.

4.12 SOCIOECONOMICS

4.12.1 PROPOSED ACTION

The proposed assignment would result in the cessation of deliveries of CVP water to irrigated agricultural lands within the BWD. This action will not induce population growth.

The Proposed Action does not involve any activities that would displace existing housing or displace a substantial amount of people necessitating construction of replacement housing elsewhere. Maintenance activities associated with fallow lands will still require workers to manipulate the land for weed and pest control. These activities will still require approximately the same amount of workers. In addition, opportunities associated with dry land farming or assisting BWD with current practices of using drain water to grow salt tolerant crops on approximately 100 acres of land within BWD, will provide additional opportunities for employment. In addition, farm workers are expected to continue working on farmlands in the surrounding districts. For the above-mentioned reasons, no housing or population displacement is anticipated under the Proposed Action (Pers. Comm., Stuhr, 2003).

Existing commercial or contract agricultural employment (up to 20 farm workers) may be reduced on agricultural land currently under production within the BWD. Local manufacturing employment (e.g., cotton gin employment, etc.) may also be affected through the conversion of agricultural activities on the project site. However, the cotton gin receives most of its work from neighboring districts, which are in a better agricultural position to grow cotton economically.

The Proposed Action would have negligible effects on the City of Firebaugh. Under the Proposed Action, some existing farm workers will likely be reemployed under the fallowing maintenance activities associated with discing the fields for weed and pest control or dry land farming activities. Other contract farm workers would be transferred to employment opportunities on neighboring agricultural operations as is the normal practice of moving to where the work is located. Additionally, because only a relatively small area of Fresno County farmland (and therefore a relatively small number of jobs) would be affected by the Proposed Action, the potential loss of local indirect employment opportunities (e.g., manufacturing, etc.) is considered minimal. In addition, these lands are projected to become fallow under the No Action Alternative as the cost of CVP irrigated agriculture within BWD becomes more and more uneconomical. The Proposed Action would not affect property values in the area and the new owners of the land would continue to pay taxes that support public services. In addition, as agricultural revenues generated within the BWD accounts for a very small faction of Fresno County agricultural economy, the Proposed Action will not have a significant impact on local and regional socioeconomic conditions.

4.12.1.1 Proposed Action Alternative – Cumulative Impacts

Based on the project-level discussion provided above, implementation of the Proposed Action will not contribute to significant cumulative impacts on local and/or regional socioeconomic conditions.

4.12.2 NO ACTION ALTERNATIVE

Under the No Action Alternative current farming activities and operations within the BWD would continue. This alternative would not result in any new developments that would induce substantial future growth in the area; nor would it result in the displacement of substantial numbers of people necessitating the construction of replacement housing elsewhere.

Under the No Action Alternative, the assignment of BWD's CVP water service contract to PVWMA would not be implemented. Currently, lands within the project site are farmed, although approximately one-third of the 9,200 acres (approximately 3,100 acres) are under fallow, with excess water supplies sold on the open market. This has been increasingly the case over the past several years. More and more of these lands are projected to become fallow under the No Action Alternative as the cost of CVP irrigated agriculture within BWD becomes more and more uneconomical. It is projected that contract farm workers would continue to transfer to other employment opportunities in neighboring districts as is the normal practice of moving to where the work is located. Additionally, because only a relatively small area of Fresno County farmland (and therefore a relatively small number of jobs) would be affected, the potential loss of local indirect employment opportunities (e.g., manufacturing, etc.) is considered minimal and less-than-significant.

4.12.2.1 No Action Alternative – Cumulative Impacts

Implementation of the No Action Alternative will not contribute to significant cumulative impacts on local and/or regional socioeconomic conditions.

4.13 PUBLIC SERVICES

4.13.1 PROPOSED ACTION ALTERNATIVE

Implementation of the Proposed Action will result in a general continuation of existing agricultural land use within the BWD and would not involve the construction of any new facilities that would require the provision of governmental services. Based on this fact, the Proposed Action would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, in order to maintain acceptable service ratios, response times, or other performance objectives for public services, including fire, police, schools, parks, and other public services.

No parks and/or recreational facilities are located within the BWD. The Proposed Action does not include any development, construction, or elements that would increase the need for recreation facilities. The Proposed Action does not include construction of any new facilities or public housing that would require upgrades and/or expansions to existing park facilities.

4.13.1.1 Proposed Action Alternative – Cumulative Impacts

The Proposed Action would not contribute to significant cumulative impacts on public services.

4.13.2 NO ACTION ALTERNATIVE

This Alternative involves the continuation of status quo farming activities in the Project Area. As such, under the No Action Alternative, public services such as police, fire, ambulance, utility, and library facilities would continue operating at current levels and changes in current service demand and provision are not anticipated.

4.13.2.1 No Action Alternative – Cumulative Impacts

The No Action Alternative would not contribute to significant cumulative impacts on public services.

4.14 TRANSPORTATION/TRAFFIC

4.14.1 PROPOSED ACTION ALTERNATIVE

Implementation of the Proposed Action is not associated with any construction-related activity that would temporarily increase the number of vehicles on local or regional roadways or create additional roadway safety hazards associated with the movement of large construction equipment (e.g., heavy trucks). Agricultural activities associated with the Proposed Action would likely result in a similar number of farming-related vehicles on local roadways. Open space or less intensive agricultural uses of the project site may actually decrease the frequency of vehicle trips on these roadways. As local roadways are currently operating at acceptable levels of service (i.e., A–B) and the Proposed Action is not anticipated to result in any substantial increases in traffic volumes, no adverse impacts to transportation and traffic will occur as a result of implementing the Proposed Action.

4.14.1.1 Proposed Action Alternative – Cumulative Impacts

The Proposed Action would not contribute to any significant cumulative traffic and/or transportation-related impacts.

4.14.2 NO ACTION ALTERNATIVE

Under the No Action, the assignment of BWD's CVP water service contract to another entity would not be implemented. Current trends in local traffic patterns, volumes, and parking capacity are expected to continue within BWD and surrounding area. It is projected that CVP irrigated agriculture will become uneconomical for farmers within BWD and more and more lands will become fallowed under the No Action Alternative. Small decreases in local farming-related traffic volumes may result as additional lands in the study area are fallowed over time. Therefore, the No Action Alternative will not adversely affect current roadways capacities. The No Action Alternative would result in the continuation of existing conditions and would not involve any activities that would increase transportation or traffic-related hazards in the area or involve any activities that would potentially affect emergency access to or within BWD.

4.14.2.1 No Action Alternative – Cumulative Impacts

The No Action Alternative would not contribute to any significant cumulative traffic and/or transportation-related impacts.

4.15 UTILITIES AND SERVICE SYSTEMS

4.15.1 PROPOSED ACTION ALTERNATIVE

The Proposed Action involves the assignment or BWD's CVP water service contract to PVWMA and will not require the construction of any new facilities. PVWMA is in the process of designing and planning the construction of an import pipeline system to the PVWMA service area in order for PVWMA to take delivery of CVP water. That project is the subject of the previously prepared PVWMA Basin Management Plan EIR (SCH No. 2000062030) and EIS in which the environmental effects have already been evaluated. The findings of those two documents are incorporated by reference into this document.

The Proposed Action would not cause an increased need for any new utilities including water, wastewater, solid waste, telephone, natural gas, electricity, or other utilities or service system within the vicinity of the BWD.

The Proposed Action will involve a slight change in operation of the CVP to deliver water to PVWMA instead of BWD. CVP water delivery to PVWMA instead of contractors south of San Luis Reservoir (e.g., BWD) would cause a decrease in flow of up to 27,000 afy in the DMC downstream of the intake channel. The decreased flow in the DMC would result in additional capacity available to contractors south of San Luis Reservoir. Additionally, as this CVP water is stored in San Luis Reservoir prior to being released back into the DMC, this change in operation would have little or no affect on operations within the San Luis Reservoir.

CVP water that was temporarily stored in San Luis Reservoir for release to contractors south of San Luis Reservoir would not be released into the DMC; instead it would be delivered to PVWMA through the San Felipe Division facilities. Up to 27,000 afy of additional water would be delivered from San Luis Reservoir to the Watsonville turnout, resulting in increased flows through the Pacheco Tunnel, Pacheco Pumping Plant, Pacheco Conduit, and Santa Clara Conduit.

The Bureau of Reclamation designed the San Felipe Division facilities with the expectation that PVWMA would receive CVP water. Reclamation has agreements that specify the maximum amount of water to be delivered to each San Felipe Division contractor: PVWMA is allotted 67 cfs at the Watsonville turnout, SBCWD is allotted 93 cfs at the Hollister turnout, and SCVWD is allotted 330 cfs at Coyote Pump Station. In total, 490 cfs is the allotted capacity for the San Felipe Division facilities [3].

The Santa Clara Valley Water District (Santa Clara) developed a hydraulic model of the San Felipe Division. Although the model shows that PVWMA's use of San Felipe Division facilities consistent with its allotted capacity would potentially affect SCVWD flows, the impact is minimal (2%) and can be mitigated through an operating agreement proposed in the Revised BMP EIS and required by the Contract reference in footnote 3.

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[3] Contract for the transfer of the Operation and Maintenance of certain San Felipe Division facilities by and between the United States of America, Santa Clara Valley Water District and San Benito County Water Conservation and Flood Control District. (Contract No. 6-07-20-X0290).

Modeling has shown that each contractor cannot receive their maximum allotted flows and meet minimum pressure requirements (2 psi) at the Coyote Pump Station.

However, a review of recent meter records show that maximum delivery limits may not be a concern. Daily meter records from July 1998 to November 2003 were reviewed to assess deliveries to SBCWD and Santa Clara. Over five years of records show that the maximum flow to SBCWD and Santa Clara is 130 cfs and 322 cfs, respectively. However, the maximum flow to both districts is 395 cfs, indicating that maximum flows to both SBCWD and Santa Clara have not occurred simultaneously. Based on these records, system capacity is not compromised if PVWMA's allotment of 67 cfs is added to the maximum flow of 395 cfs (462 cfs). Also, Santa Clara's maximum flow over the last five years (322 cfs) is below the revised maximum flow (323 cfs) required for minimum pressure requirements at Coyote Pump Station. While system capacity constraints are present, these problem conditions (simultaneous maximum flows) did not occur during that five-year period. The projected capacity demands of 462 cfs are within the design capacity of the system (490 cfs). Therefore, based on modeling results and meter records, CVP delivery schedules for San Felipe Division contractors are not likely to be impacted by PVWMA's use of its allotted capacity. For this reason, this impact is considered less-than-significant.

As indicated in the Final EIS for PVWMA's Revised BMP, energy requirements associated with importing up to 27,000 afy of water to the Pajaro Valley would be offset by a reduction in groundwater pumping of up to 26,400 afy within BWD. Imported water would be pumped from the DMC to the Pacheco Regulating tank. Conservatively, there is approximately 700 feet difference in head to the regulating tank and based on rough estimates of energy requirements, 4,800 hp would be required. These energy requirement scenarios would replace pumping up to 26,400 afy of groundwater. Groundwater pumping dynamic head in the Pajaro Valley is approximately 530 feet, which equates to energy requirements of approximately 3,700 hp. Therefore, delivery of imported water to coastal users would not significantly increase energy requirements.

4.15.1.1 Proposed Action Alternative – Cumulative Impacts

Based on identified project-level impacts, the Proposed Action Alternative will not contribute to any significant cumulative impacts to existing utility and service systems.

4.15.2 NO ACTION ALTERNATIVE

The No Action Alternative would not require the installation of new utility facilities; nor would it create new demand for existing utilities. As such, no impacts to existing utilities or service systems would occur.

4.15.2.1 No Action Alternative – Cumulative Impacts

The No Action Alternative will not contribute to any significant cumulative impacts to existing utility and service systems.

4.16 ENVIRONMENTAL JUSTICE

4.16.1 PROPOSED ACTION ALTERNATIVE

As previously described, implementation of the Proposed Action Alternative may result in the transfer or relocation of a portion of the 20 existing contract farm workers currently working in BWD. Farm workers and their households, which are predominately minority and or low-income, would be affected by these activities. As outlined in Chapter 2.0, PVWMA has proposed a management approach that places preference on hiring existing farm workers in the BWD and surrounding area. In actuality, it is anticipated that the Proposed Action would not significantly deviate from existing conditions, as one-third of the land base within the BWD is already under fallow and additional fallowing anticipated in the near-term. With this understanding, no substantial displacement or loss in existing employment opportunities is anticipated as a result of the implementation of the Proposed Action. Consequently, implementation of the Proposed Action would not disproportionately affect a specific ethnic or income group.

4.16.1.1 Proposed Action Alternative – Cumulative Impacts

Based on the project-level discussion provided above, implementation of the Proposed Action Alternative will not contribute to any significant cumulative impacts in terms of environmental justice.

4.16.2 NO ACTION ALTERNATIVE

As previously described, under the No Action Alternative, it is projected that more agricultural lands in BWD will become fallowed as CVP irrigated agriculture becomes more uneconomical in BWD. This may result in the transfer or relocation of a portion of the 20 existing contract farm workers working in BWD. Farm workers and their households, which are predominately minority and or low-income, would be affected by these activities. However, no substantial displacements or losses of employment are anticipated as a result of implementation as these workers would find similar work in neighboring Districts where agricultural economics are much better than that of BWD. Consequently, the No Action Alternative would not disproportionately affect a specific ethnic or income group.

4.16.2.1 No Action Alternative – Cumulative Impacts

Implementation of the No Action Alternative will not contribute to any significant cumulative impacts in terms of environmental justice.

4.17 INDIAN TRUST ASSETS

4.17.1 PROPOSED ACTION ALTERNATIVE

As previously described in Chapter 3.0, no ITAs have been identified in the BWD service area. As a result, implementation of the Proposed Action Alternative would not have any adverse impacts on ITAs.

4.17.1.1 Proposed Action Alternative – Cumulative Impacts

Based on the project-level discussion, it may be concluded that implementation of the Proposed Action Alternative will not result in significant cumulative impacts to ITAs.

4.17.2 NO ACTION ALTERNATIVE

As previously described in Chapter 3.0, no ITAs have been identified in the BWD service area. As a result, implementation of the No Action Alternative would not have any adverse impacts on ITAs.

4.17.2.1 No Action Alternative – Cumulative Impacts

Implementation of the No Action Alternative will not result in significant cumulative impacts to ITAs.

CHAPTER 5.0

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CHAPTER 5.0
LIST OF PREPARERS

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CHAPTER 6.0
BIBLIOGRAPHY

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CHAPTER 7.0
ACRONYMS

CHAPTER 7.0
ACRONYMS

ACM	asbestos-containing materials
af/yr	acre feet per year
BWD	Broadview Water District
CEQA	California Environmental Quality Act
CNDBB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CRHR	California Register of Historical Resources
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
Delta	San Francisco Bay Delta Estuary
DMC	Delta-Mendota Canal
DOC	Department of Conservation
DOC	California Department of Conservation
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FCFPD	Fresno County Fire Protection District
FONSI	Finding of No Significant Impact
ITA	Indian Trust Asset
MRZ-2	Mineral Resource Zone 2
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants

NOAA Fisheries	National Oceanic and Atmospheric Fisheries Service
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
Phase I	Phase I Environmental Site Assessment
PVWMA	Pajaro Valley Water Management Agency
Reclamation	U.S. Bureau of Reclamation
RWQCB	Central Valley Regional Water Quality Control Board
San Luis	San Luis Unit Contractors
SJVUSRP	San Joaquin Valley Upland Species Recovery Plan
SAR	sodium adsorption ratio
SJVAB	San Joaquin Valley Air Basin
SLDMWA	San Luis and Delta-Mendota Water Authority
STATSGO	State Soil Geographic Database
USBR	U.S. Bureau of Reclamation
USGS	U.S. Geological Survey
Westlands	Westlands Water District

APPENDIX A

ACTIVE WILLIAMSON ACT
CONTRACTS WITHIN THE
BROADVIEW WATER DISTRICT

APPENDIX A

ACTIVE WILLIAMSON ACT CONTRACTS WITHIN THE BROADVIEW WATER DISTRICT

Williamson Act Contract No.(A)	Associated Assessors Parcel Number(s)	Total Acreage
4069	00619004S, 00620022S, 00620023S	474.32
5121	00620017S, 00620033, 00620035, 00620037, 00620038, 00620042, 00620044, 00620047	461.49
6048	01103011S, 01103012S	586.19
3783	01103038S	311.06
2556	01103039S	308.21
888	01104024S, 01104028S, 01104029S, 01104030S, 01104031S	574.5
1153	01105009S, 01105013S, 01105015S, 01105019S	610.22
2457	01106005S	310.66
4358	01106007S	307.92
7758	01106011S	300.12
2456	01106014S	304.72
2952	01107019S	552.77
958	01107028S, 01107030S	302.85
4905	01107031S, 01107032S, 01107033S, 01107034S	181.88
3953	01109017S	152.90
2555	01109021S	308.07
3592	01109023S	155.11
4357	01109024S, 01109025S	608.42
920	01110007S	306.33
1174	01110014S, 01110015S, 01110016S, 01110017S	612.36
1420	01110023S, 01110024S	307.56
831	01205016S, 01205018S	283.61
1170	01208008S	154.03
1177	01208009S	157.25
1171	01208010S	157.25
1172	01208011S	154.03

Note: In several instances, one Williamson Act Contract applies to more than one parcel (APN).
SOURCE: Fresno County Assessor's Office, 2003

APPENDIX B

WILDLIFE OBSERVED ON AND ADJACENT TO THE BROADVIEW WATER DISTRICT

APPENDIX B

WILDLIFE OBSERVED ON AND ADJACENT TO THE BROADVIEW WATER DISTRICT MARCH 3–4 AND JULY 14–15, 2003

BIRDS

Great blue heron (*Ardea herodias*)
Great egret (*Ardea alba*)
Black-crowned night heron (*Nycticorax nycticorax*)
* Mallard (*Anas platyrhynchos*)
Northern harrier (*Circus cyaneus*)
Swainson's hawk (*Buteo swainsoni*)
Red-tailed hawk (*Buteo jamaicensis*)
American kestrel (*Falco sparverius*)
* Common moorhen (*Gallinula chloropus*)
American coot (*Fulica americana*)
* Killdeer (*Charadrius vociferus*)
Black-necked stilt (*Himantopus mexicanus*)
Rock dove (*Columba livia*)
Mourning dove (*Zenaida macroura*)
Black phoebe (*Sayornis nigricans*)
Western kingbird (*Tyrranus verticalis*)
Horned lark (*Eremophila alpestris*)
Northern rough-winged swallow (*Stelgidopteryx serripennis*)
Barn swallow (*Hirundo rustica*)
Cliff swallow (*Petrochelidon pyrrhonota*)
American crow (*Corvus brachyrhynchos*)
Common raven (*Corvus corax*)
* Northern mockingbird (*Mimus polyglottos*)
* Loggerhead shrike (*Lanius ludovicianus*)
European starling (*Sturnus vulgaris*)
Yellow-rumped warbler (*Dendroica coronata*)
Lark sparrow (*Chondestes grammacus*)
Song sparrow (*Melospiza melodia*)
White-crowned sparrow (*Zonotrichia leucophrys*)
Savanna sparrow (*Passerculus sandwichensis*)
* Red-winged blackbird (*Agelaius phoeniceus*)
Brewer's blackbird (*Euphagus cyanocephalus*)
Brown headed cowbird (*Molothrus ater*)
Western meadowlark (*Sturnella neglecta*)

House finch (*Carpodacus mexicanus*)
House sparrow (*Passer domesticus*)

AMPHIBIANS

Pacific treefrog (*Hyla regilla*)
Bullfrog (*Rana catesbeiana*)

MAMMALS

Audubon's cottontail (*Sylvilagus audubonii*)
Black-tailed jackrabbit (*Lepus californicus*)
* Muskrat (*Ondatra zibethicus*)
California ground squirrel (*Spermophilus beecheyi*)

* Indicates breeding observed, i.e., feeding or with young.

APPENDIX C

LIST OF SPECIES POTENTIALLY OCCURRING IN PROPOSED PROJECT AREA

APPENDIX C

LIST OF SPECIES POTENTIALLY OCCURRING IN PROPOSED PROJECT AREA

The "Potential for Species to Occur" category is defined as follows:

- **Unlikely:** The proposed project area does not support suitable habitat for a particular species or project area is outside of the species' known range.
- **Low Potential:** The proposed project area only provides limited habitat for a particular species; the known range for a particular species may be outside of the proposed project area.
- **Medium Potential:** The proposed project area provides suitable habitat within the range of a particular species, although there may be no known sightings in the area.
- **High Potential:** The proposed project area provides suitable habitat conditions for a particular species; the species is known to occur in the area.

State- and Federally-listed Species, Candidate Species, and Species Proposed for Listing			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Birds			
Buteo swainsoni Swainson's hawk	FSC/ST/--	Forages in open plains, grasslands, agricultural fields and prairies; typically nests in trees or large shrubs.	MEDIUM. The species is likely to occur in the project area due to availability of foraging habitat. Limited nesting habitat exists in the project area; a nest was documented 4.5 mi. away in 1994.
Coccyzus americanus occidentalis Western yellow-billed cuckoo	FC/SE/--	Nests in densely foliaged deciduous trees and shrubs, especially willow.	UNLIKELY. No suitable habitat vegetation exists on BWD lands.
Falco peregrinus anatum American peregrine falcon (nesting)	FD/SE/--	Breeds on high cliffs, banks, dunes, mounds, and human-made structures near wetlands, lakes, rivers, or other sources of water.	LOW. No nesting habitat exists in the project area, and foraging habitat is limited due to a low density of prey.
Haliaeetus leucocephalus Bald eagle (nesting & wintering)	FT-FPD/ SE/--	Nests in large trees with open branches along lake and river margins, usually within one mile of water.	UNLIKELY. No suitable open-water foraging habitat occurs on the BWD for this species.

State- and Federally-listed Species, Candidate Species, and Species Proposed for Listing			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Mammals			
Ammospermophilus nelsoni San Joaquin antelope squirrel	FSC/ST/--	Occurs in arid (<10") annual grassland and shrubland communities with sparse-to-moderate shrub cover. Needs friable soils and areas free from flooding for digging burrows.	MEDIUM. Project area is within the range of this species, but currently provides limited suitable habitat adjacent to drains.
Dipodomys ingens Giant kangaroo rat	FE/SE/--	Prefers annual grassland communities with sparse shrubs and friable sandy-loam soils on gentle slopes (<10 %), although it can occur in a variety of grassland and shrub communities in many soil types.	MEDIUM. Regional populations identified in the SJUSRP are concentrated near the Fresno/San Benito County line, and one location within a few miles of BWD was recorded on the valley floor. Project area is within the range of this species, but currently provides limited suitable habitat adjacent to drains.
Dipodomys nitratoides exilis Fresno kangaroo rat	FE/SE/--	Subspecies of San Joaquin kangaroo rat. Found in sandy and saline sandy soils in annual Valley grassland, chenopod scrub, alkali sink communities. Needs open/sparse vegetation, loose soils.	MEDIUM. Regional populations identified in the SJUSRP are located east of the San Joaquin River and Fresno Slough. Project area is within the range of this species, but currently provides limited suitable habitat adjacent to drains.
Vulpes macrotis mutica San Joaquin kit fox	FE/SE/--	Occurs in native valley and foothill grasslands and chenopod scrub communities of the valley floor and surrounding foothills. Prefers open level areas with loose-textured soils supporting scattered, shrubby vegetation and little human disturbance.	MEDIUM. Regional populations identified in the SJUSRP are concentrated west of Interstate 5 or east of the San Joaquin River. Project area is within the range of this species, but currently provides limited suitable habitat. The BWD area may provide linkage between populations.
Reptiles			
Gambelia sila Blunt-nosed leopard lizard	FE/SE/--	Occurs in open, valley and foothill grasslands, valley saltbush scrub, and alkali playa communities of the San Joaquin Valley, Carrizo Plain, and Cuyama Valley. Uses small mammal burrows for refuge.	MEDIUM. Populations identified in the SJUSRP are at least 5 miles from BWD. Project area is within the range of this species, but currently provides low capability habitat adjacent to drains.

State- and Federally-listed Species, Candidate Species, and Species Proposed for Listing			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Thamnophis gigas Giant garter snake	FT/ST/--	Generally inhabits marshes, sloughs, ponds, slow-moving streams, ditches, and rice fields which have water from early spring through mid-fall, emergent vegetation (such as cattails and bulrushes), open areas for sunning, and high ground for hibernation and escape cover.	MEDIUM. Project area is within the range of this species, but currently provides low capability habitat adjacent to drains. Emergent vegetation in drains occurs in a few small patches. Drain vegetation is periodically removed, and most upland habitat potentially used as winter refugia is regularly tilled. The CNDDB documents an occurrence dated 1976, 3.2 mi. away. Drain water from BWD is discharged to the San Joaquin River by the SLDMWA under a discharge permit requiring steadily improved water quality through 2009. The species may be affected by downstream changes to water quality.
Amphibians			
Rana aurora draytonii California red-legged frog	FT/CSC/--	Breeds in slow moving streams, ponds, and marshes with emergent vegetation and an absence or low occurrence of predators.	UNLIKELY. Project area provides low capability habitat. Introduced predators and little emergent vegetation limits potential for occurrence. Species assumed extirpated from region.
Fish			
Hypomesus transpacificus Delta smelt	FT/ST/--	Found in delta estuaries with dense aquatic vegetation and low occurrence of predators.	MEDIUM. This species does not occur on the BWD, but it does occur in the San Joaquin River. Drain water from BWD is discharged to the San Joaquin River via Mud Slough by the SLDMWA under a discharge permit requiring steadily improved water quality through 2009. The species may be affected by downstream changes to water quality.
Oncorhynchus mykiss Central Valley steelhead	FT/--/--	Occurs in the Sacramento and San Joaquin River watersheds and breeds in cool flowing water with suitably sized cobble.	MEDIUM. This species does not occur on the BWD, but it does occur in the San Joaquin River and tributaries. Drain water from BWD is discharged to the San Joaquin River by the SLDMWA under a discharge permit requiring steadily improved water quality through 2009. The species may be affected by downstream changes to water quality.
Pogonichthys macrolepidotus Sacramento splittail	FD/CSC/--	Prefers backwaters and sloughs of the Delta and lower San Joaquin and Sacramento rivers.	MEDIUM. This species does not occur on the BWD, but it does occur in the San Joaquin River and tributaries. Drain water from BWD is discharged to the San Joaquin River by the SLDMWA under a discharge permit requiring steadily improved water quality through 2009. The species may be affected by downstream changes to water quality.

State- and Federally-listed Species, Candidate Species, and Species Proposed for Listing			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Invertebrates			
Branchinecta lynchi Vernal pool fairy shrimp	FT/--/--	Lifecycle restricted to vernal pools.	UNLIKELY. No vernal pools exist on BWD lands.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT/--/--	Breeds and forages exclusively on blue elderberry shrubs (*Sambucus mexicana*) below 3,000 feet in elevation.	UNLIKELY. No elderberry shrubs were observed on BWD lands.
Plants			
Cordylanthus palmatus Palmate-bracted bird's beak	FE/SE/1B	Prefers seasonally-flooded, saline-alkali soils in lowland plains and basins, including agricultural drains.	UNLIKELY. Project area currently provides limited suitable habitat. No palmate bracted bird's beak was detected in a survey for the species conducted in July 2003.
Monolopia congdonii San Joaquin woollythreads	FE/--/1B	Annual herb occurring in chenopod scrub and in sandy substrate in valley and foothill grassland. Found at 60–800 meters elevation. Blooms Feb–May.	LOW. Project area currently provides limited suitable habitat. The nearest extant populations identified in the SJUSRP are located in the Panoche Hills of western Fresno County. Known populations closer to the project area have been extirpated.

Other Special Status Species Considered in the Evaluation of the Project Site			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Birds			
Agelaius tricolor Tricolored blackbird (nesting)	FSC/CSC/--	Nests in colonies in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	LOW. Potential nesting habitat is limited in the project area due to the high amount of disturbance (e.g., drain maintenance) on the project area.
Athene cunicularia Burrowing owl (burrow sites)	FSC/CSC/--	Forages in open plains, grasslands and prairies; typically nests in abandoned small mammal burrows.	MEDIUM. Project area is within the range of this species. Potential nesting and foraging habitat is present but limited in the project area. The CNDDB documents a 2001 nest occurrence 3.8 mi. away.
Branta canadensis leucopareia Aleutian Canada goose (wintering)	FD-FSC/--/--	Feeds in emergent wetlands, moist grasslands, croplands, pastures and meadows near water.	LOW. Project area does not contain suitable foraging habitat due to the lack of open water bodies.
Buteo regalis Ferruginous hawk (wintering)	FSC/CSC/--	Wintering grounds consist of open grasslands.	MEDIUM. Potential wintering foraging habitat exists on the project area, which is within the range of this species.

Other Special Status Species Considered in the Evaluation of the Project Site			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Calypte costae Costa's hummingbird	FSC/--/--	Inhabits arid scrub and chaparral communities and edges of desert and valley foothill riparian communities. Requires herbaceous and woody plants with nectar-producing flowers, and shrubs and trees for cover.	UNLIKELY. No suitable habitat vegetation exists on BWD lands.
Carduelis lawrencei Lawrence's goldfinch (nesting)	FSC/--/--	Dry grassy slopes with weed patches, chaparral, and open woodlands; nests in trees or shrubs.	UNLIKELY. No suitable habitat vegetation exists on BWD lands.
Chaetura vauxi Vaux's swift (nesting)	FSC/CSC/--	Nests in large hollow trees and forages widely, especially over riparian areas and open water.	LOW. Project area is within the range of this species; drains and canals in the BWD may provide limited foraging habitat. No suitable nesting habitat exists on BWD lands.
Charadrius montanus Mountain plover (wintering)	FSC/CSC/--	Winters in barren to sparsely-vegetated grasslands and agricultural lands between September and March. Forages on large insects.	MEDIUM. Project area provides potential winter foraging habitat, and is within the range of this species.
Elanus leucurus White-tailed kite	FSC/SFP/--	Forages in open plains, grasslands and prairies; typically nests in trees.	MEDIUM. The species is likely to occur in the project area due to availability of foraging habitat. Limited nesting habitat exists on the project area.
Empidonax traillii brewsteri Little willow flycatcher (nesting)	FSC/--/--	Wet meadow and montane riparian habitats at 600–2,500 meters.	UNLIKELY. No suitable wetland or riparian habitat exists on BWD lands.
Falco mexicanus Prairie falcon (nesting)	--/CSC/--	Breeding sites located on cliffs in dry, open terrain.	MEDIUM. Project area is within the range of this species and foraging habitat exists on BWD lands. No nesting habitat exists in the project area.
Grus canadensis tabida Greater sandhill crane (nesting and wintering)	FD/--/--	Open habitats, shallow lakes, and emergent wetlands. In winter also uses dry grasslands and croplands near wetlands.	UNLIKELY. No suitable wetland or foraging habitat exists on BWD lands.
Lanius ludovicianus Loggerhead shrike (nesting)	FSC/CSC/--	Nests in dense shrub or tree foliage, forages in scrub, open woodlands, grasslands, and croplands.	HIGH. This species was documented nesting in the project area; foraging habitat exists on BWD lands.
Melanerpes lewis Lewis' woodpecker (nesting)	FSC/--/--	Winters in oak savannahs, and broken deciduous and coniferous habitats.	UNLIKELY. No suitable vegetative communities exist on BWD lands.

Other Special Status Species Considered in the Evaluation of the Project Site			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Numenius americanus Long-billed curlew (nesting)	FSC/CSC/--	Forages in marshes, mudflats, sandy beaches, and moist grasslands and farmland. Nests in prairies and plains.	UNLIKELY. No suitable wetland or foraging habitat exists on BWD lands.
Picoides nuttallii Nuttall's woodpecker	FSLC/--/--	Uses riparian areas with adjacent oak woodland.	UNLIKELY. No suitable riparian habitat exists on BWD lands.
Plegadis chihi White-faced ibis (rookery)	FSC/CSC/--	Forages in salt, freshwater and coastal marshes, and flooded fields; nests in shrubs or reedbeds associated with marsh habitats.	UNLIKELY. No suitable wetland habitat exists on BWD lands.
Selasphorus rufus Rufous hummingbird (migratory)	FSC/--/--	Riparian areas, open woodlands, chaparral and other areas rich with nectar producing flowers.	UNLIKELY. No suitable vegetative communities exist on BWD lands.
Toxostoma redivivum California thrasher	FSC/--/--	Found in foothills and lowlands in cismontane California. Occupies moderate to dense chaparral habitats.	UNLIKELY. No suitable vegetative communities exist on BWD lands.
Mammals			
Corynorhinus (=Plecotus) townsendii townsendii Townsend's (Pacific) western big-eared bat	FSC/CSC/--	Found throughout CA, highly associated with mines and caves. Commonly feeds on moths. Maternity colonies most active from May through July.	UNLIKELY. No suitable roosting habitat exists on BWD lands.
Dipodomys nitratoides brevinasus Short-nosed kangaroo rat	FSC/CSC/--	Generally found in grassland or desert-shrub associations (*Atriplex*) on gentle-sloped or level ground. Prefers friable alkaline and saline soils.	MEDIUM. Although complete current distribution is unknown, regional populations identified in the SJUSRP occur in the Kerman Ecological Reserve, near the Alkali Sink Ecological Reserve, and south of Los Banos, east of the Delta-Mendota Canal. Recently populations were surveyed in the Panoche region in Fresno and San Benito Counties. Project area is likely within the species range and currently provides limited suitable habitat adjacent to drains.
Eumops perotis californicus Greater western mastiff-bat	FSC/CSC/--	Found in areas with rugged, rocky outcroppings where suitable crevices, such as large cracks in exfoliating slabs of granite or sandstone, are available for roosts.	UNLIKELY. No suitable roosting habitat exists on BWD lands.
Myotis ciliolabrum Small-footed myotis bat	FSC/--/--	Primarily found in mid to high elevations (6,000 feet). Roosts in cavities within trees and mines.	UNLIKELY. Project area is outside of the species' known range; species elevational range is above that of the project area.

Other Special Status Species Considered in the Evaluation of the Project Site			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Myotis volans Long-legged myotis bat	FSC/--/--	Primarily found in forested habitats. Mostly roosts in large diameter trees and snags.	UNLIKELY. No suitable roosting habitat exists on BWD lands.
Myotis yumanensis Yuma myotis bat	FSC/--/--	Often found near reservoirs or open water. Roosts in buildings, trees, mines, caves, bridges, and rock crevices.	MEDIUM. Project area is within the range of this species and foraging habitat exists on BWD lands. Limited suitable roosting habitat exists on BWD lands.
Onychomys torridus tularensis Tulare grasshopper mouse	FSC/CSC/--	Generally found in hot, arid grassland and shrub communities such as upper Sonoran subshrub scrub or alkali sink and mesquite associations on the Valley floor.	MEDIUM. Regional populations nearest to the project area are identified in the SJUSRP. The species occurs in the Panoche region in Fresno and San Benito Counties. Project area is likely within the species range and currently provides limited suitable habitat adjacent to drains.
Perognathus inornatus inornatus San Joaquin pocket mouse	FSC/--/--	Primarily found at 350–650 feet in dry, open grasslands or scrub. Will dig burrows for cover.	MEDIUM. The CNDDB documents an occurrence dated 1918, 4.3 mi. away. Project area is within the species range and currently provides limited suitable habitat adjacent to drains.
Reptiles			
Anniella pulchra pulchra Silvery legless lizard	FSC/CSC/--	Prefers sandy or loose loamy soils under sparse vegetation. Requires soils with high moisture content.	MEDIUM. Project area is within the species range and currently provides limited suitable habitat adjacent to drains.
Clemmys marmorata pallida Southwestern pond turtle	FSC/CSC/--	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	LOW. Project area provides low capability habitat. Emergent vegetation in drains occurs in a few small patches, basking sites are few. Drain vegetation is periodically removed, and most upland habitat potentially used for egg-laying is regularly tilled.
Masticophis flagellum ruddocki San Joaquin coachwhip	FSC/CSC/--	Occurs in open, dry, vegetative associations with little or no tree cover. In the western San Joaquin Valley, it occurs in valley grassland and saltbush scrub associations. Probably dependent on mammals for burrows and prey.	MEDIUM. Project area is within the species range and currently provides limited suitable habitat adjacent to drains.

Other Special Status Species Considered in the Evaluation of the Project Site			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Phrynosoma coronatum frontale California horned lizard	FSC/CSC/--	Found in a variety of habitats, most commonly in lowlands and sandy washes with scattered low bushes. Requires open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant ant/insect prey.	MEDIUM. Project area is within the species range and currently provides limited suitable habitat adjacent to drains.
Amphibians			
Spea (Scaphiopus) hammondii Western spadefoot toad	FSC/CSC/--	Breeds in shallow, temporary pools formed by winter rains. Takes refuge in burrows.	UNLIKELY. No pools are likely to form due to regularly tilled surface soils on BWD lands.
Fish			
Spirinchus thaleichthys Longfin smelt	FSC/CSC/--	Found in all major bays and estuaries from San Francisco Bay northward.	MEDIUM. This species does not occur on the BWD, but it does occur in the San Joaquin River. Drain water from BWD is discharged to the San Joaquin River via Mud Slough by the SLDMWA under a discharge permit requiring steadily improved water quality through 2009. The species may be affected by downstream changes to water quality.
Invertebrates			
Branchinecta mesovallensis Midvalley fairy shrimp	FSC/--/--	Lifecycle restricted to vernal pools in the Central Valley	UNLIKELY. No vernal pools exist on BWD lands.
Linderiella occidentalis California linderiella	FSC/--/--	Lifecycle restricted to vernal pools.	UNLIKELY. No vernal pools exist on BWD lands.
Lytta molesta Molestan blister beetle	FSC/--/--	Inhabits dry vernal pools in the Central Valley, from Contra Costa to Tulare Counties.	UNLIKELY. No vernal pools exist on BWD lands.
Plants			
Atriplex cordulata Heartscale	FSC/--/1B	Chenopod scrub, valley and foothill grassland, and meadows. Found in the sandy soils of alkaline flats and scalds in the Central Valley.	MEDIUM. Project area is within the species range and currently provides some suitable habitat.
Atriplex depressa Brittlescale	FSC/--/ 1B	Generally found in chenopod scrub, meadows and seeps, playas and grasslands.	MEDIUM. Project area is within the species range and currently provides some suitable habitat.

Other Special Status Species Considered in the Evaluation of the Project Site			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Atriplex minuscule Lesser saltscale	FSC/--/1B	Annual herb occurring in chenopod scrub, playas, and in valley and foothill grassland with sandy, alkaline substrate. Found at 15–200 meters elevation. Blooms May–Oct.	MEDIUM. Project area is within the species range and currently provides some suitable habitat. Local populations identified in the SJUSRP are located in the Kerman Ecological Reserve in Fresno County, in the Area Plains National Wildlife Refuge, and along the Fresno River in Madera County.
Atriplex vallicola Lost Hills crownscale	FSC/--/1B	Annual herb occurring in chenopod scrub, valley and foothill grassland, and in vernal pools with alkaline substrate. Found at 50–635 meters elevation. Blooms Apr–Aug.	MEDIUM. Project area is within the species range and currently provides some suitable habitat. Local concentrations of regional populations identified in the SJUSRP are located in the Kerman Ecological Reserve in Fresno County, and in southwestern Merced County.
Cordylanthus mollis ssp. hispidus Hispid bird's-beak	FSC/--/1B	Hemiparasitic, annual herb occurring in meadows and seeps, playas, and in valley and foothill grassland communities with alkaline substrate. Found at 1–155 meters elevation. Blooms Jun–Sep.	LOW. Project area currently provides limited suitable habitat, but the species is believed extirpated from much of the San Joaquin Valley floor (CNPS).
Delphinium recurvatum Recurved larkspur	FSC/--/1B	Perennial herb occurring in chenopod scrub, cismontane woodland, and in valley and foothill grassland with alkaline substrate. Found at 3–750 meters elevation. Blooms Mar–May.	MEDIUM. Project area is within the species range and currently provides limited suitable habitat.
Layia munzii Munz's tidy-tips	FSC/--/1B	Annual herb occurring in low-lying areas or on hillsides of grassland, valley saltbush scrub, valley sink scrub, or chenopod scrub communities. 45–800 meters elevation.	MEDIUM. Project area is within the species range and currently provides limited suitable habitat. Local populations identified in the SJUSRP were historically located near Firebaugh, Little Panoche Creek, and Mendota. The CNDDB documented a 1941 occurrence 1.7 miles away.
Lepidium jaredii ssp. *album* Panoche pepper-grass	FSC/--/1B	Annual herb occurring in alluvial fans and washes of valley and foothill grasslands. Found at 185–275 meters elevation. Blooms Feb–Jun.	MEDIUM. Project area is within the species range and currently provides limited suitable habitat. The nearest populations identified in the SJUSRP are located in the Ciervo-Panoche region of western Fresno and eastern San Benito Counties.
Madia radiata Showy madia	FSC/--/1B	Valley and foothill grassland, cismontane woodland, and chenopod scrub habitats. Found primarily on adobe clay in grassland or among shrubs.	UNLIKELY. Project area does not provide clay soils suitable for this species.

Other Special Status Species Considered in the Evaluation of the Project Site			
Species	**Federal/ State/CNPS Status**	**General Habitat**	**Potential for Species to Occur**
Sagittaria sanfordii Sanford's arrowhead	FSC/--/1B	Found in freshwater habitats including marshes, swamps and seasonal drainages.	MEDIUM. Project area is within the species range and currently provides low capability habitat. Drain vegetation is periodically removed and drain water from BWD is discharged to the San Joaquin River by the SLDMWA under a discharge permit requiring steadily improved water quality through 2009.

SOURCES

CNDDB 2003. Electronic inventory for the following USGS Quads: Broadview Farms, Oxalis, Poso Farm, Firebaugh, Coit Ranch, Chaney Ranch, Chounet Ranch, Hammonds Ranch and Dos Palos Quadrangles.

CNPS 2002. Electronic inventory for the following USGS Quads: Broadview Farms, Oxalis, Poso Farm, Firebaugh, Coit Ranch, Chaney Ranch, Chounet Ranch, Hammonds Ranch and Dos Palos Quadrangles.

USFWS 2003. Federally Endangered and Threatened Species list for the USGS 7.5 minute Broadview Farms Quad; and list of Species of Concern.

STATUS CODES:

FEDERAL: (U.S. Fish and Wildlife Service and National Marine Fisheries Service)
FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
FPT = Proposed for Listing as Threatened
FC = Candidate for Federal Listing
FD = Delisted
FSC = Federal Species of Special Concern

STATE: (California Department of Fish and Game)
SE = Listed as Endangered by the State of California
ST = Listed as Threatened by the State of California
SR = Listed as Rare by the State of California (plants only)
CSC = California Species of Special Concern

CNPS: (California Native Plant Society)
List 1A = Presumed extinct in California
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in California but more common elsewhere
List 4 = Plants of Limited Distribution