

# RECLAMATION

*Managing Water in the West*

## FINDING OF NO SIGNIFICANT IMPACT

### City of Tracy Long-term Central Valley Project Water Groundwater Banking with Semitropic Water Storage District

FONSI-09-164

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# Introduction

In accordance with section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, as amended, the South-Central California Area Office of the Bureau of Reclamation (Reclamation), has determined that the approval of a long-term (through Contract Year 2035) groundwater banking program between the City of Tracy (Tracy) and Semitropic Water Storage District (Semitropic) is not a major federal action that will significantly affect the quality of the human environment and an environmental impact statement is not required. This Finding of No Significant Impact (FONSI) is supported by Reclamation's Draft Environmental Assessment (EA) Number EA-09-164, *City of Tracy Long-term Central Valley Project Water Groundwater Banking with Semitropic Water Storage District*, and is hereby incorporated by reference.

Reclamation posted the Draft EA and Draft FONSI for public review and comment on Reclamation's website. The public review period began October 18, 2010 and ended on November 16, 2010. No comments were received during the public comment period.

## Background

In 2005, Tracy approached Reclamation with a request to conduct a Pilot Project for the one-time banking of 1,000 acre-feet (AF) of their allocated Central Valley Project (CVP) water at Semitropic's water bank. Reclamation analyzed the proposed Pilot Project in *EA-05-111 Groundwater Banking Pilot Project of Central Valley Project Water from City of Tracy to Semitropic Water Storage District*, and a FONSI was signed on February 23, 2007. The purpose of the Pilot Project was to determine the efficacy of transporting Tracy water supplies to Semitropic, and returning a portion of the banked supplies to Tracy in anticipation of a long-term water banking agreement between both parties. In 2009, Tracy approached Reclamation with a request for approval of a long-term banking program with Semitropic.

## Introduction

The long-term groundwater banking program will include the banking of up to 10,500 AF per year (AFY) of Tracy's available CVP surface water supplies within Semitropic. As part of this banking program, Reclamation proposes to approve the iterative transfers, exchanges and related actions (such as Warren Act contracts) for delivery of water to Semitropic for banking and return of up to 3,500 AFY of the banked water to Tracy as described in EA-09-164. These actions will be undertaken with the cooperation of the California Department of Water Resources (DWR).

The Proposed Action will be subject to the following conditions:

- The banking and exchange of Tracy's CVP water will be used as allowed in Tracy's long-term contract with Reclamation for CVP water (Contract number 14-06-200-7858A);
- Banked water will not use the In-Lieu Recharge and Recovery Area of the Stored Water Recovery Unit (SWRU). Rather, the East-West Pipeline will be used to deliver and return water from Semitropic's Direct Recharge Area;
- The water will only be used for beneficial purposes;

- The proposed return of banked water will not adversely affect DWR, Reclamation, Semitropic, or Tracy's operations;
- The movement of water will not require the construction of any new water diversion or conveyance facilities;
- Returned water will be subject to Reclamation's water quality policy for any non-CVP water introduced into federal facilities.

Reclamation's finding that implementation of the Proposed Action will result in no significant impact to the quality of the human environment is supported by the following factors:

## **FINDINGS**

### **Water Resources**

The proposed delivery to and from storage will occur through existing State Water Project (SWP), CVP, Semitropic, and Tracy facilities. No new facilities will be needed as a result of the Proposed Action. The Proposed Action will not interfere with the normal operations of the SWP and CVP facilities, nor will it impede any SWP or CVP obligations to deliver water to other contractors or to local fish and wildlife habitat. Furthermore, the Proposed Action will not interfere in the quantity or timing of diversions from the Sacramento-San Joaquin River Delta (Delta). The delivery of CVP water to Semitropic for storage will be made based on such water supplies being available pursuant to SWP and CVP water supply conditions. Neither Tracy nor any other CVP or SWP water user will be changing historic land/water management practices as a result of the Proposed Action. Project operations and facilities will not vary significantly between the Proposed Action and No Action Alternative.

In addition, the 1994 Semitropic Groundwater Banking Project Environmental Impact Report (EIR) evaluated potential impacts of the Program operations on the timing of diversions from the Delta. The studies conducted under for the EIR determined that the timing of these diversions are regulated through operational restrictions under a number of agreements and Biological Opinions designed to protect sensitive fish species. On this basis, Semitropic operations will not adversely impact the timing of diversions from the Delta. The Proposed Action will be regulated by the same operational restrictions. A copy of the draft EIR was provided to DWR.

No groundwater will be used for banking. CVP water used for banking will be in excess of Tracy's immediate needs. Semitropic's groundwater capacity is approximately 1,000,000 AF. The delivery of up to 10,500 AFY through 2035 for in lieu recharge will be within Semitropic's available capacity and will not impact Semitropic's banking partners. Furthermore, 10 percent of banked water will be left in the bank to cover losses which may help in reducing groundwater overdraft. Consequently, the Proposed Action may have slight beneficial impact to Semitropic groundwater resources.

All waters introduced and conveyed through federal facilities must meet Reclamation water quality standards. If, through monitoring, the returned water fails to meet the criteria for discharging non-CVP water into federal facilities, the water will not be introduced into the Delta-Mendota Canal until subsequent testing has demonstrated that the water quality has been met.

Therefore, there will be no substantial impacts to water quality as a result of the Proposed Action.

### **Land Use**

Neither Semitropic nor Tracy will change historic land and water management practices. All water will move through existing facilities so there will be no change to land use due to the construction of new facilities. Water from the Proposed Action will be used to increase the reliability of Tracy's water supplies and may be used for any future development within Tracy's existing contract boundary covered by and consistent with Tracy's adopted General Plan analyzed in an Environmental Impact Report certified by Tracy July 20, 2006 (Tracy 2006). No lands will be annexed into any service area under the Proposed Action. Any use of this water outside of Tracy's current CVP service area will require Contractor approval and additional environmental review. Any change in land use will be consistent with Tracy's approved 2006 General Plan. Therefore, land use trends will continue unaltered and there will be no adverse impacts to land use as a result of the Proposed Action.

### **Biological Resources**

Reclamation has determined that there will be no effect to federally listed species from the Proposed Action. The Proposed Action will not result in native lands or lands fallowed and untilled for three or more years being converted or cultivated with CVP water within Semitropic. No unbuilt portion of the SWRU will be utilized. Additionally, the Proposed Action will not result in any change in diversions from the Delta. The water that will be banked under the Proposed Action will have otherwise been diverted from the Delta and used within Tracy's service area. This banked water may be used for future development within Tracy, which could contribute to effects on federally listed species. However, these effects are unknown and speculative at this time and not part of the Proposed Action as Reclamation has no land use authority or jurisdiction over land use changes. San Joaquin County, which does have land use authority, has approved Tracy's general plan which includes future buildout. Any future effects due to development will be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the Endangered Species Act (ESA).

### **Cultural Resources**

Transferring water as described in the Proposed Action is an undertaking as described in Section 301(7) of the National Historic Preservation Act (NHPA), that initiates Section 106 of the NHPA and its implementing regulations under 36 CFR Part 800. All transfers will occur through existing facilities and water will be provided within existing service area boundaries to areas that currently use water. The action will not result in modification of any existing facilities, construction of new facilities, change in land use, or unplanned growth. This action has no potential to cause effect to historic properties pursuant to the regulations at 36 CFR Part 800.3(a)(1). As a result, the Proposed Action will result in no impacts to cultural resources.

### **Indian Trust Assets**

There will be no impact to Indian Trust Assets (ITA) as there are none in the Proposed Action location. The nearest ITA is Santa Rosa Rancheria approximately 32 miles north of the Proposed Action location.

### **Environmental Justice**

The Proposed Action will not cause dislocation, changes in employment, or increase flood, drought, or disease nor will it disproportionately impact economically disadvantaged or minority populations. There may be a slight beneficial impact to economically disadvantaged or minority populations as a result of the Proposed Action due to the increase in water supply reliability within Tracy.

### **Socioeconomic Resources**

The Proposed Action does not alter Tracy's CVP contract quantity and no new water supplies will be created by the Proposed Action. Instead, existing CVP supplies will be banked for future use by Tracy during water shortage years providing a reliable water supply. The banked water will reduce the potential need to purchase additional water supplies at a much higher rate which will likely have beneficial impacts on socioeconomic resources within Tracy.

### **Air Quality**

The delivery of Tracy's CVP water supply to Semitropic for banking will consist of moving water through existing facilities via gravity and electrical pumps. Semitropic has 105 wells (district-owned and farmer-owned) that are used to pump groundwater into the California Aqueduct for return of banked water to its banking partners. Ninety-five of these wells are electric (all district-owned wells are electric), eight are diesel, and two are natural gas. The return of banked water to Tracy will require the use of four wells to deliver water to the California Aqueduct for use by DWR. Although, it is likely that the wells used for the return of Tracy's banked water will be electric, emission calculations are based on the use of 300 horsepower diesel engines as a worst-case scenario. Water will then be exchanged and delivered to Tracy from the electric pumps at Jones Pumping Plant. Air quality emissions from electrical power have been considered in environmental documentation for the generating power plant. There are no emissions from electrical engines. Calculated project emissions for non-electric pumps used for return of Tracy's banked water are well below the San Joaquin Valley Air Pollution Control District's *de minimis* thresholds; therefore, there will be no impact on air quality and a conformity analysis is not required.

### **Global Climate**

Calculated carbon dioxide emissions from the use of electric pumps are well below the Environmental Protection Agency's threshold for annually reporting greenhouse gas emissions (25,000 metric tons/year). Accordingly, the Proposed Action will result in below *de minimis* impacts respecting global climate change.

### **Cumulative Impacts**

The Proposed Action, when added to other past, present, and future actions does not result in additional diversions of water, or significantly impact global climate change and water, cultural, land use, or socioeconomic resources. Neither ITA nor disadvantaged or minority populations will be impacted. Past effects to biological resources include losses of land to agricultural and urban development, which have reduced and fragmented the extent of suitable habitat for many federally threatened and endangered species. There will be no cumulative effects on federally listed species as a result of the Proposed Action. However, as described above, future buildout

within Tracy could have impacts on federally listed species which could result in cumulative impacts. These impacts are not part of the Proposed Action and will be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan through Section 10 of the ESA.

# RECLAMATION

*Managing Water in the West*

## **Final Environmental Assessment**

# **City of Tracy Long-term Central Valley Project Water Groundwater Banking with Semitropic Water Storage District**

**EA-09-164**



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

**May 2011**

## **Mission Statements**

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

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



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# List of Acronyms and Abbreviations

AF	Acre-foot
AFY	Acre-foot per year
APE	Area of Potential Effect
Aqueduct	California Aqueduct
BCID	Banta-Carbona Irrigation District
CAA	Clean Air Act
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWA	Clean Water Act
Delta	Sacramento-San Joaquin River Delta
DMC	Delta-Mendota Canal
DWR	California Department of Water Resources
EA	Environmental Assessment
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination Act
GHG	greenhouse gases
HCP	Habitat Conservation Plan
ITA	Indian Trust Asset
KCWA	Kern County Water Agency
MBTA	Migratory Bird Treaty Act
MP	Milepost
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Nitrogen oxides
O <sub>3</sub>	Ozone
PM <sub>2.5</sub>	Particulate matter less than 2.5 microns in diameter
PM <sub>10</sub>	Particulate matter between 2.5 and 10 microns in diameter
PPM	Parts per million
Program	Semitropic Groundwater Banking and Exchange Program
Reclamation	Bureau of Reclamation
Semitropic	Semitropic Water Storage District
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SOD	South-of-Delta
SO <sub>2</sub>	Sulfur dioxide

SWP	State Water Project
SWRQB	State Water Resources Control Board
SWRU	Stored Water Recovery Unit
TDS	Total Dissolved Solids
Tracy	City of Tracy
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Society
VOC	Volatile organic compounds
WSID	West Side Irrigation District
WWD	Westlands Water District

# Section 1 Purpose and Need for Action

## 1.1 Background

In 2005, the City of Tracy (Tracy) approached the Bureau of Reclamation (Reclamation) with a request to conduct a Pilot Project for the one-time banking of 1,000 acre-feet (AF) of their allocated Central Valley Project (CVP) water at Semitropic Water Storage District's (Semitropic) water bank. Reclamation analyzed the proposed Pilot Project in an environmental assessment (EA), *EA-05-111 Groundwater Banking Pilot Project of Central Valley Project Water from City of Tracy to Semitropic Water Storage District*, and a Finding of No Significant Impact (FONSI) was signed on February 23, 2007. Both FONSI/EA-05-111 are hereby incorporated by reference. The Pilot Project included the return of 100 AF of the banked water within the 2007 water year (March 1, 2007 through February 29, 2008) to Tracy and another 100 AF in the 2008 water year (March 1, 2008 through February 28, 2009). The purpose of the Pilot Project was to determine the efficacy of transporting Tracy water supplies to Semitropic, and returning a portion of the banked supplies to Tracy in anticipation of a long-term water banking agreement between both parties. In 2009, Tracy approached Reclamation with a request for approval of a long-term banking program with Semitropic.

## 1.2 Purpose and Need

California has experienced a severe drought in recent years that has reduced water supplies to many CVP contractors. South-of-Delta (SOD) CVP water service contractors experienced reduced water supply allocations in 2007, 2008, 2009, and 2010 due to hydrologic conditions and regulatory requirements. The hydrologic conditions for 2011 are still evolving, and although conditions have improved since the beginning of the water year, it is likely that SOD CVP contractors will still need to supplement supplies to meet demands because of past dry years, relatively low reservoir storage levels, and overall CVP operational constraints. Tracy, as a SOD CVP contractor, thus needs to identify additional supplies to avoid shortages for their customers.

The purpose of the Proposed Action is to provide Tracy with a means to maximize the beneficial use of their CVP water supply by banking this supply in Semitropic when their CVP water supplies exceed demand. The use of CVP water for the purpose of groundwater banking outside the contract service area provides Tracy with operational flexibility and facilitates better management of its CVP water supply.

Additionally, by banking Tracy's surplus CVP water supplies in its facilities, Semitropic would be able to help alleviate some of the groundwater overdraft conditions to the aquifer underlying the district by requiring that a portion of Tracy's banked water remain in the aquifer to cover losses associated with groundwater banking.

## 1.3 Scope

This EA is being prepared to examine the possible impacts of approving a long-term (through contract year 2035) water banking program between Tracy and Semitropic. Tracy is located entirely within San Joaquin County while Semitropic is located entirely within Kern County (Figures 1-1 and 1-2). This EA has also been prepared to examine the possible impacts of the No Action Alternative.

This EA does not analyze the use of banked water for future developments within Tracy, as they are unknown and speculative at this time and outside Reclamation's authority and jurisdiction. San Joaquin County, which does have land use authority, has approved Tracy's general plan which includes future buildout within Tracy's service area.

This EA also does not analyze the buildout or use of the In-Lieu Recharge and Recovery Area of the Stored Water Recovery Unit (SWRU) within Semitropic as it is not a part of the Proposed Action. Any future use of this area would require additional environmental documentation as part of this banking project.

## 1.4 Reclamation's Legal and Statutory Authorities

Several Federal laws, permits, licenses and policy requirements have directed, limited or guided the National Environmental Policy Act analysis and decision-making process of this EA and include the following:

- *The Reclamation Reform Act of 1982* applies to all irrigation land within an irrigation/water district, which has a water service contract with Reclamation and is subject to the acreage limitation and full-cost provisions of Reclamation law.
- *Section 3(d) of CVP Water Service Contracts* identifies the use of CVP water outside the Contractors' service area. This section states that "Groundwater recharge programs, groundwater banking programs, surface water storage programs and other similar programs utilizing CVP water or other water furnished pursuant to the CVP contract conducted outside the Contractors' service area may be permitted upon written approval of the Contracting Officer, which approval will be based upon environmental documentation, CVP water rights, and CVP operation concerns. The Contracting Officer will address such concerns in regulations policies, or guidelines."
- *Central Valley Project Improvement Act of 1992, Title 34 (of Public Law 102-575), Section 3408(c)*, Additional Authorities authorizes the Secretary of the Interior to enter into contracts pursuant to Reclamation law and this title with any Federal agency, California water user or water agency, State agency, or private nonprofit organization for the exchange, impoundment, storage, carriage, and delivery of CVP and non-CVP water for domestic, municipal, industrial, fish and wildlife, and any other beneficial purpose, except that nothing in this subsection shall be deemed to supersede the provisions of Section 103 of Public Law 99-546 (100 Stat. 3051).
- *The Warren Act as of February, 21, 1911, CH. 141, (36 STAT. 925)* authorizes Reclamation to negotiate agreements to store or convey non-CVP water when excess capacity is available in federal facilities.

- Reclamation's *Interim Guidelines for Implementation of Water Transfers under Title XXXIV of Public Law 102-575 (Water Transfer)*, February 25, 1993 for the implementation of the water transfer provisions of Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575, 106 Stat. 4600).
- Reclamation and U.S. Fish and Wildlife Service (USFWS) Regional, *Final Administrative Proposal on Water Transfers* April 16, 1998 guidelines for the unique roles of Reclamation and the USFWS for reviewing and processing any proposed water transfer prior to final approval.
- Reclamation's Mid-Pacific Regional Director's Letter entitled “*Delegation of Regional Functional Responsibilities to the Central Valley Project (CVP) Area Offices – Water Transfers*”, March 17, 2009 delegates specific functional responsibilities to the CVP Area Offices for the review, approval, and administration of water transfers within each area manager’s geographic area of responsibility.
- Reclamation requires that the operation and maintenance of CVP facilities shall be performed in such manner as is practical to maintain the quality of raw water at the highest level that is reasonably attainable. Water quality and monitoring requirements are established by Reclamation to protect water quality in the Delta-Mendota Canal (DMC) by ensuring that imported non-CVP water does not impair existing uses or negatively impact existing water quality conditions (Appendix A). These standards are updated periodically. The annual review for the approval of Warren Act Contracts would be subject to the then-existing water quality standards. The water quality standards are the maximum concentration of certain contaminants that may occur in each source of non-CVP water. The water quality standards for non-CVP water to be stored and conveyed in federal facilities are currently those set out in Title 22 of the California Code of Regulations.

## 1.5 Potential Issues

This EA will analyze the affected environment of the Proposed Action in order to determine the potential and cumulative impacts to:

- Water Resources
- Land Use
- Biological Resources
- Cultural Resources
- Indian Trusts Assets (ITA)
- Environmental Justice
- Socioeconomic Resources
- Air Quality
- Global Climate

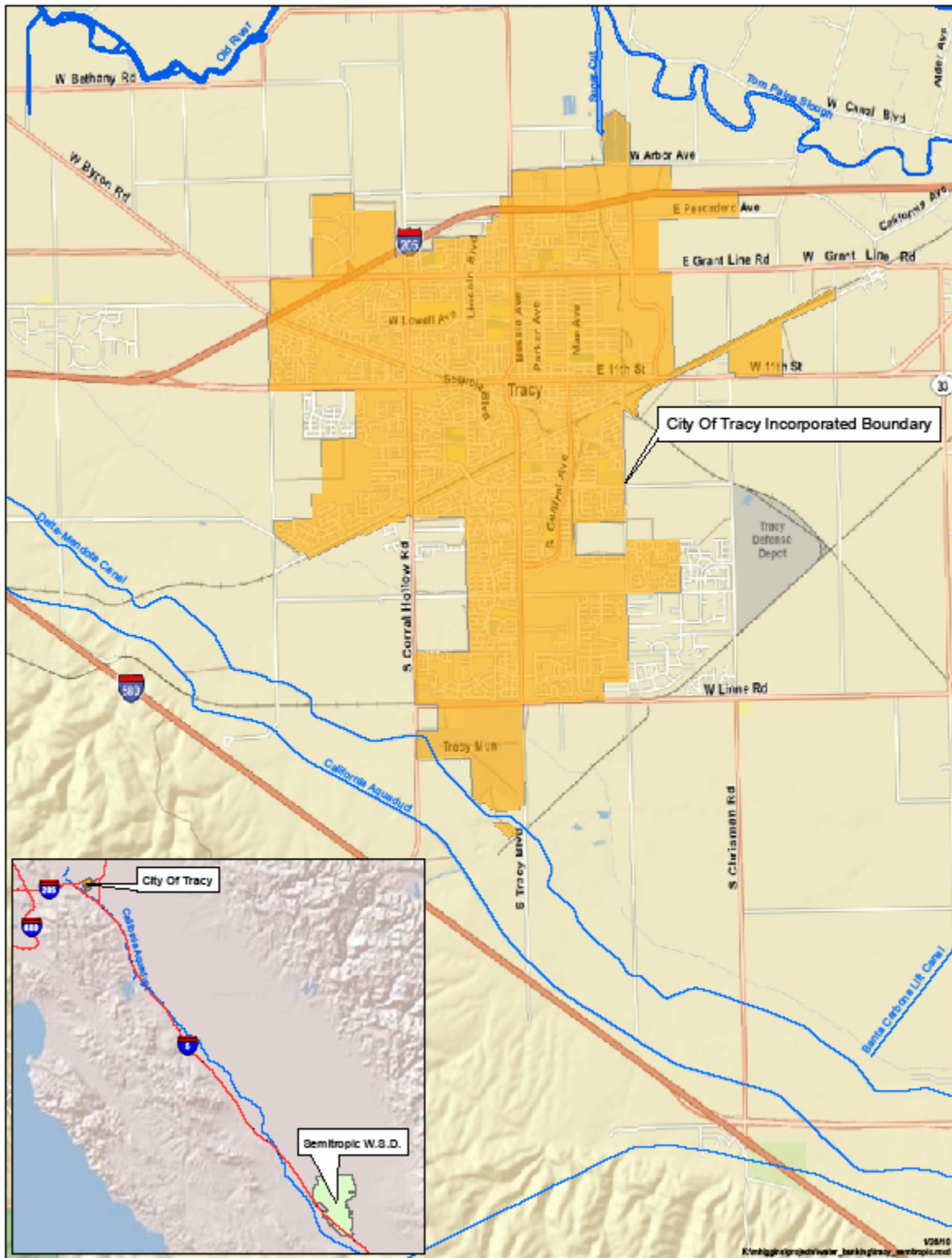


Figure 1-1 City of Tracy Proposed Action Location



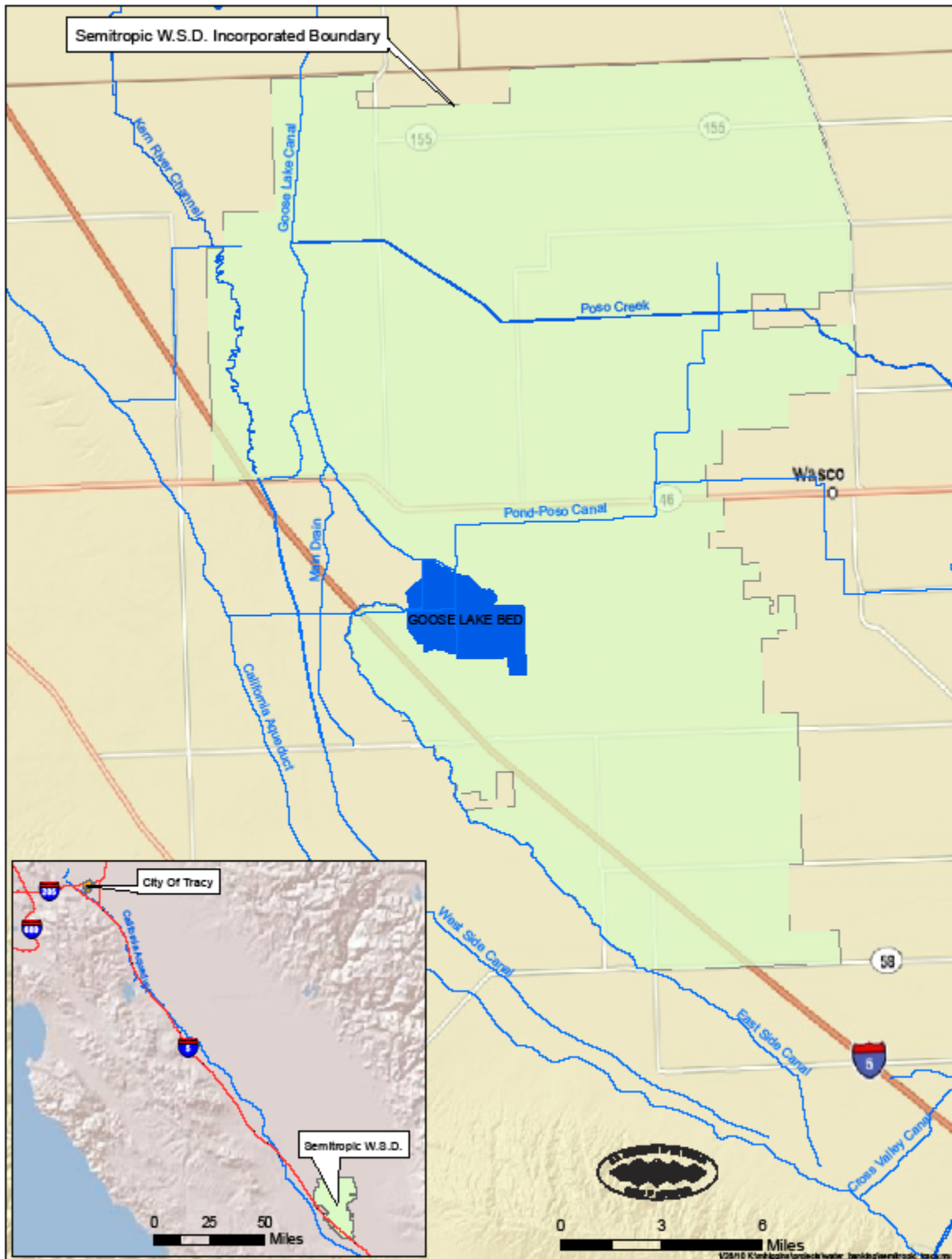


Figure 1-2 Semitropic Water Storage District Proposed Action Location

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## **Section 2 Alternatives Including the Proposed Action**

This EA considers two possible actions: the No Action Alternative and the Proposed Action. The No Action Alternative reflects future conditions over the next 25 years without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment.

### **2.1 No Action Alternative**

Under the No Action Alternative, Reclamation would not approve the long-term storage of Tracy's CVP water at Semitropic. Recovery of the 700 AF of banked water would be the same as those analyzed within FONSI/EA-05-111 through 2016. Tracy would continue to receive their contracted CVP water allocation from the Sacramento-San Joaquin Bay-Delta (Delta) through the DMC to their existing turnouts dependent upon hydrologic conditions. Semitropic would continue to engage in banking opportunities and exchanges to maximize management of their water supply within the facilities available to them. Tracy would continue to find new ways of increasing supply reliability and engage in transfers and exchanges with other agencies to help reduce the impacts of critical dry year shortages. Any such actions are outside the scope of this EA and may require additional environmental analysis.

### **2.2 Proposed Action**

Reclamation proposes to approve Tracy's long-term (through contract year 2035) groundwater banking of up to 10,500 AF per year (AFY) of their available CVP surface water supplies with Semitropic. As part of this banking program, Reclamation proposes to approve the iterative transfers, exchanges and related actions for delivery of water to Semitropic for banking and return of up to 3,500 AFY of the banked water to Tracy. These actions would be undertaken with the cooperation of the California Department of Water Resources (DWR).

The Proposed Action would be subject to the following conditions:

- The banking and exchange of Tracy's CVP water would be used as allowed in Tracy's long-term contract with Reclamation for CVP water (Contract number 14-06-200-7858A);
- Banked water would not use the In-Lieu Recharge and Recovery Area of the SWRU. Rather, the East-West Pipeline (120-inch pipeline) would be used to deliver and return water from Semitropic's Direct Recharge Area (Figure 2-1);
- The water would only be used for beneficial purposes;
- The proposed return of banked water would not adversely affect DWR, Reclamation, Semitropic, or Tracy's operations;
- The movement of water would not require the construction of any new water diversion or conveyance facilities;

- Returned water would be subject to Reclamation's water quality policy for non-CVP water introduced into federal facilities (Appendix A).

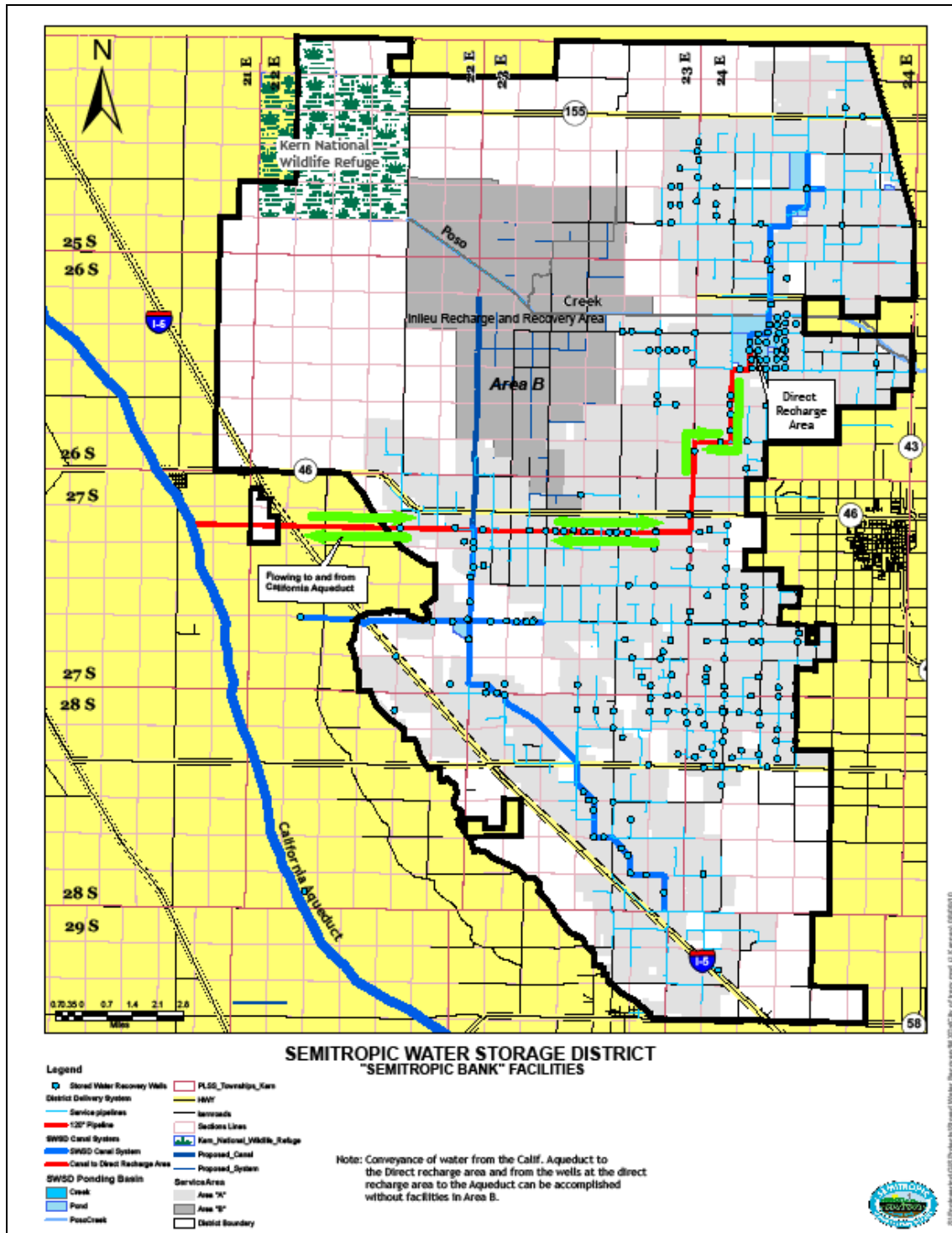


Figure 2-1 Semitropic Banking Facilities

### **2.2.1 City of Tracy Surface Water Supplies for Banking**

Tracy's banking supplies include their long term contract allocation (Contract No. 14-06-200-7858A), a contract assignment from West Side Irrigation District [WSID] (Contract No. 7-07-20-W0045-IR12-B), and a contract assignment from Banta Carbon Irrigation District [BCID] (Contract No. 14-06-200-4305A-IR12-B).

Tracy is a CVP contractor that receives its CVP supplies from milepost (MP) 15.95 on the DMC. Semitropic contracts with DWR for State Water Project (SWP) water through the Kern County Water Agency (KCWA). Physical Delivery of Semitropic's SWP water occurs through Reaches 10A, 12E, and 13B of the California Aqueduct (Aqueduct). While Tracy and Semitropic receive water from separate water projects, these two projects intersect and commingle water at the O'Neill Forebay of the San Luis Reservoir, located near Santa Nella, California. The exchange of water between the CVP and SWP systems would occur primarily at O'Neill.

Conveyance of water to Semitropic from Tracy would most likely occur as an operational exchange at O'Neill and then direct delivery to Semitropic's turnouts in KCWA. Tracy's CVP water would be released from the federal share of San Luis Reservoir by Reclamation and made available to DWR's SWP at O'Neill via operational exchange. DWR would then deliver Tracy's CVP water from O'Neill to KCWA for banking within Semitropic or within Semitropic's share of the Kern Water Bank facilities. Ten percent of water banked with Semitropic would be left in place to recharge the aquifer.

### **2.2.2 Return of Banked Water via Exchange**

Up to 3,500 AFY of banked water would be returned to Tracy on request. Methods for return could occur in the following ways:

1. The extracted Semitropic banked water would be delivered into the Aqueduct to meet downstream SWP demands. In exchange, a like amount of KCWA SWP water would be exchanged back to O'Neill for delivery, via the state share of the joint use San Luis Canal, to Westlands Water District (WWD) turnouts within Reach 7 of the Aqueduct servicing lands within Kings County.
2. The extracted Semitropic banked water would be delivered into the Aqueduct to meet downstream SWP demands. In exchange, a like amount of KCWA SWP water would be exchanged back to O'Neill. A State Water Resources Control Board (SWRCB) approved Petition for Temporary Change in Place of Use would be obtained to authorize the delivery of the SWP water outside of the SWP place of use. The exchanged SWP water would then be delivered under the Temporary Change in Place of Use order from O'Neill to meet downstream federal CVP demands in Merced and Fresno Counties, in exchange for a like amount of CVP water made available for delivery to Tracy via Tracy's turnout along the DMC. This method would use joint state and federal facilities (San Luis Canal) and would not require a Warren Act contract authorizing the conveyance of non-Project SWP water through federal facilities (DMC).
3. The extracted Semitropic banked water would be delivered into the Aqueduct to meet downstream SWP demands. In exchange, a like amount of KCWA SWP water would be delivered to Tracy's turnout along the DMC via CVP's Jones Pumping Plant, as authorized under the SWRCB's Joint Point of Diversion (D-1641). While the delivery of the SWP water would not require a Change in Place of Use order, as the City of Tracy

lies within the SWP place of use, it would require a Warren Act Contract from Reclamation.

4. In anticipation of the proposed San Luis Canal-DMC Intertie linking the SWP and CVP, a fourth return mechanism is being contemplated. The extracted Semitropic banked water would be delivered into the Aqueduct to meet downstream SWP demands. In exchange, a like amount of KCWA SWP water would be delivered via SWP's Banks Pumping Plant, and diverted through the Intertie to Tracy's turnout along the DMC. While the delivery of the SWP water would not require a Change in Place of Use order, as the City of Tracy lies within the SWP place of use, it would require a Warren Act contract from Reclamation to authorize the conveyance of the SWP water through federal facilities (the DMC).

## Section 3 Affected Environment and Environmental Consequences

The potentially affected environment includes the lands within Tracy and Semitropic, as well as any State, local or federal facilities involved in the conveyance and exchange of this water.

### 3.1 Water Resources

#### 3.1.1 Affected Environment

FONSI/EA-05-111 described the affected environment for the SWP, CVP, and Tracy facilities. As these facilities have not changed from those described in FONSI/EA-05-111 and it has been incorporated by reference, they will not be repeated here.

##### *City of Tracy*

Tracy's water demand has increased dramatically in the last 23 years. In 1987, water demand was 8,262 AF; in 2008 the demand was 17,118 AF (West Yost Associates 2009). Demand is expected to grow to 30,500 AF by 2030 (West Yost Associates 2009). Current water sources and their 100 percent annual allocations can be found in Table 3-1.

**Table 3-1 City of Tracy Current Water Sources**

Water Source	100% Annual Allocation (AF)	Source
CVP contract	10,000	Delta-Mendota Canal
Stanislaus River Water	10,000	South County Water Supply Project
Groundwater	9,000	8 Tracy wells
Pilot Banking Project	333	Semitropic Water Bank
West Side Irrigation District CVP Assignment	2,500	Delta-Mendota Canal
Banta-Carbona Irrigation District CVP Assignment	5,000	Delta-Mendota Canal
<b>Total</b>	<b>36,833</b>	

Source: West Yost Associates 2009

Although, annual allocation shown in Table 3-1 indicate enough water sources to meet the growing needs of Tracy, actual allocations fluctuate depending on hydrological and environmental conditions and are usually much less than 100 percent. The actual allocations received by Tracy between 2004 and 2008 can be found in Table 3-2.

**Table 3-2 City of Tracy Historical Water Allocations (AF)**

	2004	2005	2006	2007	2008	Average
CVP	11,187	8,920	6,048	6,374	6,503	7,806
Groundwater	7,176	5,826	3,034	3,672	2,598	4,461
Stanislaus River	0	3,146	8,918	9,130	8,017	5,842
<b>Total</b>	<b>20,367</b>	<b>19,897</b>	<b>20,006</b>	<b>21,183</b>	<b>19,126</b>	<b>18,110</b>

Source: West Yost Associates 2009

Tracy overlies a part of the Tracy sub-basin of the San Joaquin Valley groundwater basin. Safe yield of this basin for Tracy is reported to be 9,000 AFY (West Yost Associates 2009). On average, Tracy pumps much less than 9,000 AFY (Table 3-2) and plans to decrease this amount even further as surface supplies become available (West Yost Associates 2009).

### ***Semitropic Groundwater Banking and Exchange Program***

In 1995, Semitropic began implementation of the Semitropic Groundwater Banking and Exchange Program (Program). The Program is a long-term water storage program designed to recharge groundwater and reduce overdraft, increase operational reliability and flexibility, and optimize the distribution and use of available water resources between Semitropic and potential banking partners. Under the Program, the banking partner would deliver a portion of its excess SWP, CVP or other surface water supplies to Semitropic during periods when such water is available. Semitropic may use this water in lieu of pumping groundwater for irrigation or directly recharge the underlying groundwater basin. Upon request, Semitropic would return the banking partner's previously stored water by exchange. The banking partner's stored water may be pumped from Semitropic's groundwater basin through pump-back facilities into the Aqueduct and provided to DWR in exchange for SWP water delivered to the partners from the Delta; or Semitropic would retain the stored water for its own use in exchange for an equivalent portion of its SWP water supply. The water would be the same or better water quality as that exchanged. Under the first method (delivery of recovered banked water to the Aqueduct), the water is delivered to the SWP water supply pool from which deliveries would be made by DWR to the banking partners (Semitropic 1997).

Program capacity is 1,000,000 AF. Total Program annual withdrawal amounts are restricted by the size of the pump-back facility, simultaneous scheduled SWP deliveries to the groundwater bank, and the proportion of the total Program capacity that has been contracted to other banking partners. The annual withdrawal capacity includes up to 133,000 AF of SWP water that could be exchanged within the Aqueduct, and/or an additional 90,000 AFY of groundwater extraction to the Aqueduct. Thus, the return capacity of the original program is a minimum of 90,000 AFY, and a maximum of 223,000 AFY (Semitropic 1997).

Semitropic has been in the process of constructing the second phase of its groundwater banking program. This new unit, the SWRU, would increase storage by 650,000 AF for a maximum of 1.65 million AF and increase recovery capacity by 200,000 AFY for a total guaranteed or pump-back capacity of 290,000 AFY. This means that the Semitropic Groundwater Storage Bank, including its entitlement exchange capability of up to 133,000 AFY, would be able to deliver up to 423,000 AFY of dry year yield to the Aqueduct once the SWRU is completed (Semitropic 2006). The In-Lieu Recharge and Recovery Area, is currently undergoing separate environmental analysis and is therefore not part of the Proposed Action at this time. Should this area become functional, separate environmental analysis would be required to include it within the proposed banking program.

**Groundwater Resources** Semitropic resides within the Kern County sub-basin of the San Joaquin Valley groundwater basin. The Kern County subbasin has been identified by DWR as being critically over drafted. By definition, "a basin is subject to critical conditions of overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts" (DWR 2003). In



addition, water quality concerns have been identified for areas within the trough of the San Joaquin Valley. Primary constituents of concern include total dissolved solids (TDS), nitrate, arsenic, and organic compounds caused by evaporation, poor drainage, and agricultural and industrial runoff (DWR 2003). High levels of arsenic are found within the Kern County Lake bed area as well as other lake bed areas (DWR 2003).

The average annual concentration of constituents of concern within Semitropic's groundwater during the last three years of pump-back can be found in Table 3-3. Semitropic has been conducting a pilot project to remove arsenic from water used for pump-back (Paul Oshel, Semitropic District Engineer, personal communication 2010). See Appendix B for water quality averages within Semitropic for 2001, 2004, and 2007.

**Table 3-3 Average Constituent Concentrations during Pump-back Years in Semitropic**

Constituents of Concern	2001	2004	2007
Arsenic (µg/L)	8.4	9.7	10.8
Total Dissolved Solids (mg/L)	408	367	344
Bromide (µg/L)	340	335	370
Chromium (µg/L)	NR	15.7	10.1
Chromium 6 (µg/L)	5.8	11.2	6.3
Nitrate (mg/L)	4.8	6.8	6.2
Total Organic Carbon (mg/L)	1.22	1.01	0.5
Sulfate (mg/L)	89	94	86.8
Uranium (pCi/L)	2.5	2.8	2.2
Electrical Conductivity (µS/cm)	631	584	584

Source: Paul Oshel, Semitropic District Engineer

Note: µg/L = microgram per liter  
 mg/L = milligram per liter  
 pCi/L = picocuries per liter  
 µS/cm = microSiemens per centimeter  
 NR = not recorded

### **3.1.2 Environmental Consequences**

#### **3.1.2.1 No Action**

Under the No Action Alternative, surface and groundwater supplies would be the same as existing conditions described above.

#### **3.1.2.2 Proposed Action**

The proposed delivery to and from storage would occur through existing SWP, CVP, Semitropic, and Tracy facilities. No new facilities would be needed as a result of the Proposed Action. The Proposed Action would not interfere with the normal operations of the SWP and CVP facilities, nor would it impede any SWP or CVP obligations to deliver water to other contractors or to local fish and wildlife habitat. Furthermore, the Proposed Action would not interfere in the quantity or timing of diversions from the Delta. The delivery of CVP water to Semitropic for storage would be made based on such water supplies being available pursuant to SWP and CVP water supply conditions. Neither Tracy nor any other CVP or SWP water user would be changing historic

land/water management practices as a result of the Proposed Action. Project operations and facilities would not vary significantly under either alternative.

In addition, the 1994 Semitropic Groundwater Banking Project Environmental Impact Report (EIR) evaluated potential impacts of the Program operations on the timing of diversions from the Delta. The studies conducted under for the EIR determined that the timing of these diversions are regulated through operational restrictions under a number of agreements and Biological Opinions designed to protect sensitive fish species. On this basis, Semitropic operations would not adversely impact the timing of diversions from the Delta. The Proposed Action would be regulated by the same operational restrictions. A copy of the draft EIR was provided to DWR (Reclamation 2007).

No groundwater would be used for banking. CVP water used for banking would be in excess of Tracy's immediate needs. Semitropic's groundwater capacity is approximately 1,000,000 AF. The delivery of up to 10,500 AFY through 2035 for in lieu recharge would be within Semitropic's available capacity and would not impact Semitropic's banking partners. Furthermore, 10 percent of banked water would be left in the bank to cover losses which may help in reducing groundwater overdraft. Consequently, the Proposed Action may have slight beneficial impact to Semitropic groundwater resources.

All waters introduced and conveyed through federal facilities must meet Reclamation water quality standards. If, through monitoring, the returned water fails to meet the criteria for discharging non-CVP water into federal facilities, the water would not be introduced into the DMC until subsequent testing has demonstrated that the water quality has been met by the criteria as outlined in Tables 5, 6 and 7 of Appendix A. Therefore, there would be no adverse impacts to water quality as a result of the Proposed Action.

### **3.1.2.3 Cumulative Impacts**

Due to the results of Tracy's 2007 Pilot Project, Tracy has requested a long-term groundwater banking project with Semitropic. Reclamation has environmentally analyzed and approved water banking projects, including long-term projects, in previous years (Table 3-4).

**Table 3-4 Water Banking Projects Proposed to Reclamation between 2005-2009**

	2005	2006	2007	2008	2009
Semitropic banking & return	4	4	0	3	3
Other banking & return	4	1	1	2	11
<b>Total Banking Projects &amp; Return</b>	<b>8</b>	<b>5</b>	<b>1</b>	<b>5</b>	<b>14</b>

In 2009, Reclamation received 14 requests for water banking projects and/or return of previously banked water. Three of the 14 requests utilized Semitropic. Seven of the 14 requests, including the Proposed Action, are still under environmental analysis and have not been completed at this time. Reclamation did approve the following water banking projects in 2009:

- *SEA-09-62 Meyers Farm Water Banking Project Addition of Banta Carbona Irrigation District Supplies.* The annual banking, extraction, and exchange of up to 5,000 AF of

Banta Carbon Irrigation District's pre-1914 San Joaquin River water rights water in Meyers Farm Water Bank over a 22 year period.

- *CEC-09-72 Water for America Challenge Grant DIED Turnipseed Groundwater Bank Phase I.* Water for America Challenge Grant partial funding for construction of one extraction well and five monitoring wells within an existing recharge basin.
- *SEA-09-74 Amendment to the Storage and Exchange of Central Valley Project Water Delano-Earlimart Irrigation District to North Kern Water Storage District.* The extension of water banking through 2026 and the addition of uncontrolled spill from Millerton Reservoir (Section 215 water) to the Class 1 and Class 2 CVP water to be banked.
- *EA-09-108 Delano-Earlimart Irrigation District Turnipseed Groundwater Bank Phase II.* American Recovery and Reinvestment Act partial funding of modifications to an existing recharge basin to create a new water banking facility.
- *EA-09-112 Antelope Valley Water Bank Initial Recharge and Recovery Facility Improvement Project.* American Recovery and Reinvestment Act partial funding of modifications to an existing 160 acre recharge basin, construction of a new 160 acre recharge basin, new turnout, and up to nine recovery wells with associated pipelines.
- *EA-09-134 Semitropic Water Storage District Pond-Poso Spreading and Recovery Facility.* American Recovery and Reinvestment Act partial funding for the construction of a new spreading and recovery facility adjacent to the Pond-Poso Canal.
- *EA-09-157 Storage and return of Westlands Water District's Central Valley Project Water in Semitropic Water Storage District.* The banking of 50,000 AF of Westlands Water District's 2009-2010 CVP allocation in Semitropic by March 1, 2010 and the annual recovery of up to 20,000 AF as needed within 10 years of the initial banking deposit.

As in the past, hydrological conditions and other factors are likely to result in fluctuating water supplies and this drives requests for water service actions. Water districts aim to provide water to their customers based on available water supplies and timing, all while attempting to minimize costs. Long-term water banking provides an avenue to maximize the beneficial use of Tracy's CVP supplies, improves their long-term water supply stability, and reduces dependence upon groundwater resources during critically dry years.

There would be no cumulative impacts to State, federal, or local facilities since the Proposed Action would use existing facilities when there is available capacity. In addition, the Proposed Action would not result in increases or decreases cumulatively to water diverted from rivers or waterways as the water to be banked would be from Tracy's existing CVP supply.

The return of the banked water would be subject to Reclamation's water quality standards and monitoring (Appendix A). Water that fails to meet these standards would not be moved through Reclamation facilities until further testing proves the water to be compliant with the standards. Consequently, there would be no direct, indirect, or cumulative impacts to water quality.

The long-term banking of up to 10,500 AFY of Tracy's available CVP supplies would be within the capacity available at Semitropic and would not cumulatively impact the available storage of other banking partners. There would be a cumulatively beneficial impact to groundwater

recharge beneath Semitropic due to 10 percent of the water delivered remaining in the aquifer. Consequently, no adverse cumulative impacts to surface water or groundwater supplies are anticipated as a result of implementing the Proposed Action.

## **3.2 Land Use**

### **3.2.1 Affected Environment**

#### ***City of Tracy***

Tracy is the only CVP contractor in the DMC Unit that is a municipality and uses its CVP water supply solely for M&I use. As urban growth continues, both in Tracy and along the Interstate 5 corridor, urbanization would likely continue to expand into neighboring water districts. A larger portion of the development in Tracy would be residential in nature; however, an increase in industrial and commercial development is also anticipated. Fueling growth in the area is low land prices and expansion out of the San Francisco Bay Area. It is expected that some lands located in neighboring WSID, Byron-Bethany Irrigation District, and BCID may detach from their respective districts and be annexed to Tracy. Once annexed, Tracy would be responsible for fulfilling all water supply needs (Tracy 2005).

#### **Semitropic Water Storage District**

Kern County is the fourth most productive agricultural county in the nation. As a semiarid region, it must rely on adequate imported water for its farming. It is estimated that 75 percent of the water applied to local crops goes to satisfying actual crop requirements (Kern 2005). Irrigated acreage in Semitropic is approximately 160,000 acres and consists mainly of field crops (Semitropic 2006).

### **3.2.2 Environmental Consequences**

#### ***No Action***

Land use conditions would remain the same as existing conditions described above; therefore, no additional impacts to land use are associated with this alternative.

#### ***Proposed Action***

Neither Semitropic nor Tracy would change historic land and water management practices. All water would move through existing facilities so there would be no change to land use due to the construction of new facilities. Water from the Proposed Action would be used to increase the reliability of Tracy's water supplies and may be used for any future development within Tracy's existing contract boundary covered by and consistent with Tracy's adopted General Plan analyzed in an EIR certified by Tracy July 20, 2006 (Tracy 2006). No lands would be annexed into any service area under the Proposed Action. Any use of this water outside of Tracy's current CVP service area would require Contractor approval and additional environmental review. Any change in land use would be consistent with Tracy's approved 2006 General Plan. Therefore, land use trends would continue unaltered and there would be no adverse impacts to land use as a result of the Proposed Action.

### Cumulative Impacts

It is anticipated that annexations of surrounding agricultural lands into Tracy would occur due to economic pressures for farmers to sell their land and urban expansion. This trend is expected to continue with or without the Proposed Action. The implementation of the Proposed Action would result in a more stable water supply being available to Tracy during water short years. The long-term banking Proposed Action was proposed to meet current and future water demands and is expected to be used for any future development within Tracy's current CVP service area boundary covered under their approved 2006 General Plan.

## 3.3 Biological Resources

### 3.3.1 Affected Environment

As the vegetation and habitat setting within Semitropic and Tracy have not changed from those described in FONSI/EA-05-111 and it has been incorporated by reference, they will not be repeated here. An updated list of species protected under the federal Endangered Species Act [ESA] (16 U.S.C. 1532 et seq.; Table 3-5) for the Tracy action area was generated on September 15, 2010 (Document #100915121357) by accessing the USFWS Database: [http://www.fws.gov/sacramento/es/spp\\_list.htm](http://www.fws.gov/sacramento/es/spp_list.htm) and the California Department of Fish and Game (CDFG) Natural Diversity Database (USFWS 2009a and 2009b and CNDDDB 2009). The list includes species identified on the following U.S. Geological Survey (USGS) 7.5 minute quadrangles surrounding the Tracy Proposed Action area including: Union Island and Tracy. There is no critical habitat that overlaps or touches Tracy's service area for CVP water.

**Table 3-5 Federally listed species from the vicinity of the Proposed Action area near Tracy**

<b><u>Species</u></b>	<b><u>Status</u><sup>1</sup></b>	<b><u>Effects</u><sup>2</sup></b>	<b><u>Summary basis for ESA determination</u><sup>3</sup></b>
<b>Amphibians</b>			
California red-legged frog ( <i>Rana draytonii</i> )	T, X	NE	<b>Possible.</b> Some known records to the east in the Diablo Range. This species is believed absent from most of the San Joaquin Valley floor. Although there would be no effect on this species as a result of the federal action, any future effects due to development that may use the banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.
California tiger salamander ( <i>Ambystoma californiense</i> )	T, X	NE	<b>Possible.</b> Some known records to the south of the Tracy's service area for CVP water. Although there would be no effect on this species as a result of the federal action, any future effects due to development that may use the banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.
<b>Fish</b>			
Central Valley steelhead ( <i>Oncorhynchus mykiss</i> )	T, X	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area and none would be affected by the Proposed Action.
Central Valley spring-run Chinook salmon ( <i>Oncorhynchus tshawytscha</i> )	T, X	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area and none would be affected by the Proposed Action.

<b><u>Species</u></b>	<b><u>Status</u><sup>1</sup></b>	<b><u>Effects</u><sup>2</sup></b>	<b><u>Summary basis for ESA determination</u><sup>3</sup></b>
Chinook salmon, winter-run Sacramento River ( <i>Oncorhynchus tshawytscha</i> )	E, X	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area and none would be affected by the Proposed Action.
Delta smelt ( <i>Hypomesus transpacificus</i> )	T, X	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area and none would be affected by the Proposed Action.
Green sturgeon ( <i>Acipenser medirostris</i> )	T, X	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area and none would be affected by the Proposed Action.
<b>Invertebrates</b>			
Valley elderberry longhorn beetle ( <i>Desmoceris californicus dimorphus</i> )	T, X	NE	<b>Possible.</b> There are no CNDDDB records for this species in the Tracy service area for CVP water, but there could be elderberry shrubs present. Although there would be no effect on this species as a result of the federal action, any future effects due to development that may use the banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.
Vernal pool fairy shrimp ( <i>Branchinecta lynchi</i> )	T, X	NE	<b>Possible.</b> There may be some suitable habitat around the southern and eastern edges of Tracy's service area for CVP water. Although there would be no effect on this species as a result of the federal action, any future effects due to development that may use the banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.
Vernal pool tadpole shrimp ( <i>Lepidurus packardii</i> )	E, X	NE	<b>Possible.</b> There may be some suitable habitat around the southern and eastern edges of Tracy's service area for CVP water. Although there would be no effect on this species as a result of the federal action, any future effects due to development that may use the banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.
<b>Mammals</b>			
Riparian brush rabbit ( <i>Sylvilagus bachmani riparius</i> )	E	NE	<b>Unlikely.</b> The only known populations are in the south Delta near French Camp, in Stanislaus County, and at Caswell Memorial State Park near Ripon. Although there would be no effect on this species as a result of the federal action, any future effects due to development that may use the banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.
Riparian (San Joaquin Valley) woodrat ( <i>Neotoma fuscipes riparia</i> )	E	NE	<b>Unlikely.</b> Only known populations are in Stanislaus County and Caswell Memorial State Park near Ripon. Although there would be no effect on this species as a result of the federal action, any future effects due to development that may use the banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.

<b><u>Species</u></b>	<b><u>Status</u><sup>1</sup></b>	<b><u>Effects</u><sup>2</sup></b>	<b><u>Summary basis for ESA determination</u><sup>3</sup></b>
San Joaquin kit fox ( <i>Vulpes macrotis mutica</i> )	E	NE	<b>Possible.</b> Suitable foraging habitat is present and there are CNDDDB records from the Tracy service area for CVP water. Although there would be no effect on this species as a result of the federal action, any future effects due to development that may use the banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.
<b>Plant</b>			
Large-flowered fiddleneck ( <i>Amsinckia grandiflora</i> )	E, X	NE	<b>Unlikely.</b> Only found in two reintroduced locations, one at Site 300 on the Lawrence Livermore National Laboratory in southwestern San Joaquin County and the second at Lougher Ridge in Contra Costa County. Although there would be no effect on this species as a result of the federal action, any future effects due to development that may use the banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.
<b>Reptiles</b>			
Giant garter snake ( <i>Thamnophis gigas</i> )	T	NE	<b>Absent.</b> The species is present on the valley floor near Stockton but suitable habitat would not occur near Tracy, which is in the Diablo Range.
<p>1 Status= Listing of Federally special status species, unless otherwise indicated  E: Listed as Endangered  T: Listed as Threatened  X: Critical Habitat designated for this species</p> <p>2 Effects = effect determination  NE = No Effect  NLAA = Not likely to adversely affect  MAA = May adversely affect</p> <p>3 Definition Of Occurrence Indicators  Present: Species observed in area  Possible: Species not observed at least in the last 10 years  Absent: Species not observed in study area and habitat requirements not met</p> <p>4 CNDDDB = California Natural Diversity Database 2009</p>			

An updated list of species was also generated for the Semitropic action area on September 15, 2010 (Document #10091512203). The list includes species identified on the following USGS 7.5 minute quadrangles surrounding the Semitropic Proposed Action area including: Rio Bravo, Buttonwillow, Lokern, Pond, Wasco NW, Wasco, SW, Wasco, Lost Hills NE, Lost Hills NW, Lost Hills, Semitropic, Allensworth, Delano West, Lone Tree Well, and Hacienda Ranch. There is no critical habitat within Semitropic's portion of the Proposed Action area.

**Table 3-6 Federally listed species from the vicinity of the Proposed Action area near Semitropic**

<b><u>Species</u></b>	<b><u>Status</u><sup>1</sup></b>	<b><u>Effects</u><sup>2</sup></b>	<b><u>Summary basis for ESA determination</u><sup>3</sup></b>
<b>Amphibians</b>			
California red-legged frog ( <i>Rana draytonii</i> )	T, X	NE	<b>Absent.</b> No vernal pools or suitable habitat are present in the Proposed Action area and none would be affected by the Proposed Action.
California tiger salamander ( <i>Ambystoma californiense</i> )	T, X	NE	<b>Absent.</b> No suitable habitat in the Proposed Action area and none would be affected by the Proposed Action. This species is believed

<b><u>Species</u></b>	<b><u>Status</u><sup>1</sup></b>	<b><u>Effects</u><sup>2</sup></b>	<b><u>Summary basis for ESA determination</u><sup>3</sup></b>
			absent from most of the San Joaquin Valley floor.
<b>Birds</b>			
California condor ( <i>Gymnogyps californianus</i> )	E, X	NE	<b>Absent.</b> No suitable habitat or critical habitat for this species is present in the Proposed Action area or would be affected.
Least Bell's vireo ( <i>Gymnogyps californianus</i> )	E, X	NE	<b>Absent.</b> No suitable habitat or critical habitat for this species is present in the Proposed Action area or would be affected.
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	E, X	NE	<b>Absent.</b> No suitable habitat or critical habitat for this species is present in the Proposed Action area or would be affected.
Western snowy plover ( <i>Charadrius alexandrinus nivosus</i> )	T, X	NE	<b>Absent.</b> No suitable habitat or critical habitat for this species is present in the Proposed Action area or would be affected.
<b>Fish</b>			
Delta smelt ( <i>Hypomesus transpacificus</i> )	T, X	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area and none would be affected by the Proposed Action. Waterways affected do not connect with the Delta.
<b>Invertebrates</b>			
Conservancy fairy shrimp ( <i>Branchinecta conservatio</i> )	E, X	NE	<b>Absent.</b> No vernal pools or supporting aquatic habitat are present in Proposed Action area and none would be affected by the Proposed Action.
Valley elderberry longhorn beetle ( <i>Desmocerus californicus dimorphus</i> )	T, X	NE	<b>Absent.</b> No elderberry plants (suitable habitat) would be affected by the Proposed Action and hence this species would not be affected.
Vernal pool fairy shrimp ( <i>Branchinecta lynchi</i> )	T, X	NE	<b>Absent.</b> No vernal pools or supporting aquatic habitat are present in Proposed Action area and none would be affected by the Proposed Action.
<b>Mammals</b>			
Buena Vista Lake shrew ( <i>Sorex ornatus relictus</i> )	E, X	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area or would be affected. The nearest record is from approximately five miles away and was recorded in 1943.
Giant kangaroo rat ( <i>Dipodomys ingens</i> )	E	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area or would be affected. The nearest record is from approximately five miles away and was recorded in 1943.
San Joaquin kit fox ( <i>Vulpes macrotis mutica</i> )	E	NE	<b>Present.</b> Suitable foraging habitat is present; however, there would be no land use changes as a result of the project.
Sierra Nevada bighorn sheep ( <i>Ovis canadensis californiana</i> )	E	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area or would be affected.
Tipton kangaroo rat ( <i>Dipodomys nitratoideus nitratoideus</i> )	E	NE	<b>Absent.</b> No suitable habitat is present in the Proposed Action area or would be affected. The nearest record is from approximately five miles away and was recorded in 1943.
<b>Plant</b>			
California jewelflower ( <i>Caulanthus californicus</i> )	E	NE	<b>Absent.</b> No suitable habitat or critical habitat is present in the Proposed Action area and none would be affected.
Kern mallow ( <i>Eremalche kernensis</i> )	E	NE	<b>Absent.</b> No suitable habitat or critical habitat is present in the Proposed Action area and none would be affected.
San Joaquin woolly threads ( <i>Monolopia congdonii</i> )	E	NE	<b>Absent.</b> No suitable habitat or critical habitat is present in the Proposed Action area and none would be affected.
<b>Reptiles</b>			



<b><u>Species</u></b>	<b><u>Status</u><sup>1</sup></b>	<b><u>Effects</u><sup>2</sup></b>	<b><u>Summary basis for ESA determination</u><sup>3</sup></b>
Blunt-nosed leopard lizard ( <i>Gambelia sila</i> )	E	NE	<b>Absent.</b> No suitable habitat for this species is present in the Proposed Action area and none would be affected by the Proposed Action.
Giant garter snake ( <i>Thamnophis gigas</i> )	T	NE	<b>Absent.</b> No records for this species are available from recent history from the lower San Joaquin Valley and this species is believed absent south of areas connected to Mendota Pool, far from the Proposed Action area.
<p>1 Status= Listing of Federally special status species, unless otherwise indicated  E: Listed as Endangered  T: Listed as Threatened  X: Critical Habitat designated for this species</p> <p>2 Effects = effect determination  NE = No Effect  NLAA = Not likely to adversely affect</p> <p>3 Definition Of Occurrence Indicators  Present: Species observed in area  Possible: Species not observed at least in the last 10 years  Absent: Species not observed in study area and habitat requirements not met</p> <p>4 CNDDDB = California Natural Diversity Database 2009</p>			

### 3.3.2 Environmental Consequences

#### **No Action**

Under the No Action Alternative, Semitropic is expected to proceed with the construction and operation and maintenance of the SWRU. Semitropic would comply with the ESA and California Endangered Species Act through the Kern Water Bank Habitat Conservation Plan (HCP). Development would likely continue in and around Tracy, which is covered by the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan. This would result in special-status species impacts, but they would be properly minimized and mitigated.

#### **Proposed Action**

Reclamation has determined that there would be no effect to federally listed species from the Proposed Action. The Proposed Action would not result in native lands or lands fallowed and untilled for three or more years being converted or cultivated with CVP water within Semitropic. No unbuilt portion of the SWRU would be utilized. Additionally, the Proposed Action would not result in any change in diversions from the Delta. The water that would be banked under the Proposed Action would have otherwise been diverted from the Delta and used within Tracy's service area. This banked water may be used for future development within Tracy, which could contribute to effects on federally listed species. However, these effects are unknown and speculative at this time and not part of the Proposed Action as Reclamation has no land use authority or jurisdiction over land use changes. San Joaquin County, which does have land use authority, has approved Tracy's general plan which includes future buildout. Any future effects due to development would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.

#### **Cumulative Impacts**

Past effects include losses of land to agricultural and urban development, which have reduced and fragmented the extent of suitable habitat for many federally threatened and endangered species. There would be no cumulative effects on federally listed species as a result of the

Proposed Action. However, as described above, future buildout within Tracy could have impacts on federally listed species which could result in cumulative impacts. These impacts are not part of the Proposed Action and would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan through Section 10 of the ESA.

### **3.4 Cultural Resources**

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

The Section 106 process is outlined in the Federal regulations at 36 Code of Federal Regulations (CFR) Part 800. These regulations describe the process that the Federal agency (Reclamation) takes to identify cultural resources and the level of effect that the proposed undertaking will have on historic properties. In summary, Reclamation must first determine if the action is the type of action that has the potential to affect historic properties. If the action is the type of action to affect historic properties, Reclamation must identify the area of potential effects (APE), determine if historic properties are present within that APE, determine the effect that the undertaking will have on historic properties, and consult with the State Historic Preservation Office, to seek concurrence on Reclamation's findings. In addition, Reclamation is required through the Section 106 process to consult with Indian Tribes concerning the identification of sites of religious or cultural significance, and consult with individuals or groups who are entitled to be consulting parties or have requested to be consulting parties.

#### **3.4.1 Affected Environment**

Resources within the scope of the Proposed Action include historic features of the built environment primarily those of the CVP and SWP. Components of the CVP have been determined eligible for inclusion in the National Register and have been prepared for inclusion in the National Register through a multiple property nomination. The CVP multiple property nomination is currently being edited by Reclamation following review by the Keeper of the National Register.

Tracy receives their CVP contract water from the DMC, a component of the CVP. The DMC was completed in 1951, and carries water from its inlet one mile south of the Bill Jones Pumping Plant 116 miles to its terminus at Mendota Pool. The DMC is considered a contributing element of the CVP multiple property listing and is considered eligible for inclusion in the National Register under Criterion A.

The San Luis Unit is joint Federal (CVP) and State of California (SWP) project. The Federal components of the San Luis Unit include O'Neil Pumping Plant and Intake Canal, Coalinga Canal, Pleasant Valley Pumping Plant, and the San Luis Drain. The features of the San Luis Unit are not considered contributing features of the CVP's National Register status.

Additionally, the features of the San Luis Unit were all completed in the late 1960's and are only now approaching the age consideration for inclusion in the National Register.

### **3.4.2 Environmental Consequences**

#### ***No Action***

There would be no impact to cultural resources as conditions would remain the same as existing conditions.

#### ***Proposed Action***

Transferring water as described in the Proposed Action is an undertaking as described in Section 301(7) of the NHPA, initiating Section 106 of the NHPA and its implementing regulations at 36 CFR Part 800. All transfers would occur through existing facilities and water would be provided within existing service area boundaries to areas that currently use water. The action would not result in modification of any existing facilities, construction of new facilities, change in land use, or growth. This action has no potential to cause effect to historic properties pursuant to the regulations at 36 CFR Part 800.3(a)(1). As a result, the Proposed Action would result in no impacts to cultural resources.

#### ***Cumulative Impacts***

The Proposed Action when added to the previous transfer and banking activities and reasonably foreseeable transfer and banking activities within Semitropic does not contribute to cumulative affects to any cultural resources.

## **3.5 Indian Trust Assets**

ITA are legal interests in assets that are held in trust by the United States Government for federally recognized Indian tribes or individuals. The trust relationship usually stems from a treaty, executive order, or act of Congress. The Secretary of the interior is the trustee for the United States on behalf of federally recognized Indian tribes. "Assets" are anything owned that holds monetary value. "Legal interests" means there is a property interest for which there is a legal remedy, such a compensation or injunction, if there is improper interference. Assets can be real property, physical assets, or intangible property rights, such as a lease, or right to use something. ITA cannot be sold, leased or otherwise alienated without United States' approval. Trust assets may include lands, minerals, and natural resources, as well as hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, ITA may be located off trust land.

Reclamation shares the Indian trust responsibility with all other agencies of the Executive Branch to protect and maintain ITA reserved by or granted to Indian tribes, or Indian individuals by treaty, statute, or Executive Order.

### **3.5.1 Affected Environment**

The nearest ITA is Santa Rosa Rancheria approximately 32 miles north of the Proposed Action location.

### 3.5.2 Environmental Consequences

#### **No Action**

There would be no impacts to ITA as conditions would remain the same as existing conditions.

#### **Proposed Action**

There would be no impact to ITA as there are none in the Proposed Action location.

#### **Cumulative Impacts**

There are no ITA in the action area; therefore, the Proposed Action when added to previous and reasonably foreseeable banking activities do not contribute to cumulative impacts to ITA.

## 3.6 Environmental Justice

Executive Order 12898 (February 11, 1994) mandates Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

### 3.6.1 Affected Environment

The populations of Tracy and Kern County increased by 44.2 and 21.0 percent, respectively, between 2000 and 2008, greater than the State of California population change of 8.5 percent (Table 3-7). In 2008, Tracy's per capita income was higher than the State average while Kern County was lower. Subsequently, the percentage of people living in poverty in Kern County was much higher than the State average while Tracy's was lower (U.S. Census Bureau 2008). Minority populations in Kern County is slightly higher than the State average while Tracy's is slightly lower; however, the Hispanic population in Kern County is 10 percent greater than either Tracy or the State's (U.S. Census Bureau 2008). In addition, the market for seasonal workers on local farms draws thousands of migrant workers, commonly of Hispanic origin from Mexico and Central America, into the San Joaquin Valley.

**Table 3-7 City of Tracy and Kern County Demographics**

Place	Population	% Population change since 2000	% of Minority	Per capita income	% of Poverty
City of Tracy	82,082	44.2	44.3	26,937	9.3
Kern County	800,458	21.0	48.9	15,760	20.5
California	36,756,666	8.5	47.7	22,711	13.3

Source: U.S. Census Bureau 2008

### 3.6.2 Environmental Consequences

#### **No Action**

Under the No Action Alternative, Tracy may be required to purchase additional water sources. The cost of water on the open market is likely to be much higher than their contracted water supplies which could potentially impact disadvantaged or minority populations due to the economic impacts to the agricultural industry and current water demands. Conditions would remain the same as existing conditions within Semitropic.

### ***Proposed Action***

The Proposed Action would not cause dislocation, changes in employment, or increase flood, drought, or disease nor would it disproportionately impact economically disadvantaged or minority populations. There may be a slight beneficial impact to Environmental Justice as a result of the Proposed Action due to the increase in water supply reliability within Tracy.

### ***Cumulative Impacts***

The Proposed Action may also provide a slight cumulatively beneficial impact to economically disadvantaged populations or minority populations due to the increase in water supply reliability in Tracy.

## **3.7 Socioeconomic Resources**

### **3.7.1 Affected Environment**

Tracy's per capita income is greater than the State's average whereas Kern County's is significantly lower (Table 3-8). Both Kern County and Tracy have a higher unemployment rate than the State (U.S. Census Bureau 2008). Major industries within Tracy include education and healthcare, professional services, retail trade, and manufacturing (U.S. Census Bureau 2008). In Kern County, major industries include education and healthcare, retail trade, and agriculture and related services (U.S. Census Bureau 2008).

**Table 3-8 City of Tracy and Kern County Economic Characteristics**

<b>Economic Characteristic</b>	<b>City of Tracy</b>		<b>Kern County</b>		<b>California</b>	
	<b>Estimate</b>	<b>Percentage</b>	<b>Estimate</b>	<b>Percentage</b>	<b>Estimate</b>	<b>Percentage</b>
Median Household Income	79,667	--	44,716	--	61,154	--
Unemployed	--	8.9	--	9.5	--	6.9
Families below poverty level	--	6.3	--	16.6	--	9.6
Under 18 below poverty	--	11.3	--	27.2	--	17.9
Over 18 below poverty	--	8.4	--	16.6	--	11.2

Source: U.S. Census Bureau 2008

### **3.7.2 Environmental Consequences**

#### ***No Action***

Under the No Action Alternative, Semitropic would continue to bank water within their groundwater bank through existing sources and facilities available to them. Tracy would continue to receive its CVP water supplies but may be required to purchase additional water supplies during water shortage years. This additional water would likely cost much more than their existing CVP contract creating potential economic hardships for the population of Tracy. Therefore, there could be adverse impacts to socioeconomic resources in Tracy as a result of the No Action Alternative.

#### ***Proposed Action***

The Proposed Action does not alter Tracy's CVP contract quantity and no new water supplies would be created by the Proposed Action. Instead, existing CVP supplies would be banked for future use with Tracy during water shortage years providing a reliable M&I water supply.

The banked water would reduce the potential need to purchase additional water supplies at a much higher rate which would likely have beneficial impacts on socioeconomic resources within Tracy.

### **Cumulative Impacts**

The Proposed Action has a beneficial cumulative impact to socioeconomic resources for Tracy due to the better management of existing CVP water supplies. Additionally, the long-term banking of existing CVP supplies during years of plentiful supply would offset water short years and reduce the need for purchasing additional water supplies which could cost substantially more.

## **3.8 Air Quality**

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

### **3.8.1 Affected Environment**

The Proposed Action area lies within the San Joaquin Valley Air Basin (SJVAB). The pollutants of greatest concern in the San Joaquin Valley are carbon monoxide (CO), ozone (O<sub>3</sub>), O<sub>3</sub> precursors such as volatile organic compounds (VOC) or nitrogen oxides (NO<sub>x</sub>), and inhalable particulate matter less than 10 microns in diameter (PM<sub>10</sub>) and particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>). The SJVAB has reached Federal and State attainment status for CO, nitrogen dioxide (NO<sub>2</sub>), and sulfur dioxide (SO<sub>2</sub>). Federal attainment status has been reached for PM<sub>10</sub> but is in non-attainment for O<sub>3</sub> and its precursors, and PM<sub>2.5</sub>, (Table 3-9 and 3-11). There are no standards for NO<sub>x</sub>; however, NO<sub>x</sub> contributes to the standards for NO<sub>2</sub>.

**Table 3-9 San Joaquin Valley Attainment Status**

Pollutant	Averaging Time	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
O <sub>3</sub>	8 Hour	0.070 ppm (137 µg/m <sup>3</sup> )	Nonattainment	0.075 ppm	Nonattainment
	1 Hour	0.09 ppm (180 µg/m <sup>3</sup> )	Nonattainment	--	--
CO	8 Hour	9.0 ppm (10 mg/m <sup>3</sup> )	Attainment	9.0 ppm (10 mg/m <sup>3</sup> )	Attainment
	1 Hour	20.0 ppm (23 mg/m <sup>3</sup> )	Unclassified	35.0 ppm (40 mg/m <sup>3</sup> )	Unclassified
NO <sub>2</sub>	Annual arithmetic mean	0.030 ppm (56 µg/m <sup>3</sup> )	Attainment	0.053 ppm (100 µg/m <sup>3</sup> )	Attainment
	1 Hour	0.18 ppm (338 µg/m <sup>3</sup> )	Attainment	--	--

Pollutant	Averaging Time	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
SO <sub>2</sub>	Annual average	--	--	0.03 ppm (80 µg/m <sup>3</sup> )	Attainment
	24 Hour	0.04 ppm (105 µg/m <sup>3</sup> )	Attainment	0.14 ppm (365 µg/m <sup>3</sup> )	Attainment
	1 Hour	0.25 ppm (655 µg/m <sup>3</sup> )	Attainment	--	--
PM <sub>10</sub>	Annual arithmetic mean	20 µg/m <sup>3</sup>	<b>Nonattainment</b>	--	--
	24 Hour	50 µg/m <sup>3</sup>	<b>Nonattainment</b>	150 µg/m <sup>3</sup>	Attainment
PM <sub>2.5</sub>	Annual Arithmetic mean	12 µg/m <sup>3</sup>	<b>Nonattainment</b>	15 µg/m <sup>3</sup>	<b>Nonattainment</b>
	24 Hour	--	--	35 µg/m <sup>3</sup>	Attainment
Lead	30 day average	1.5 µg/m <sup>3</sup>	Attainment	--	--
	Rolling-3 month average	--	--	0.15 µg/m <sup>3</sup>	Unclassified

Source: CARB 2010; SJVAPCD 2010; 40 CFR 93.153

ppm = parts per million

mg/m<sup>3</sup> = milligram per cubic meter

µg/m<sup>3</sup> = microgram per cubic meter

PM<sub>2.5</sub> = inhalable fine particulate matter less than 2.5 microns in diameter

-- = No standard established

### 3.8.2 Environmental Consequences

#### **No Action**

There would be no impacts to air quality as conditions would remain the same as existing conditions under this alternative.

#### **Proposed Action**

The delivery of Tracy's CVP water supply to Semitropic for banking would consist of moving water through existing facilities via gravity and electrical pumps (Table 3-10).

**Table 3-10 Pumping Facilities Involved in Delivery of Tracy's CVP water to Semitropic**

Facility	Horsepower	Rate of Flow
Jones Pumping Plant	22,500	767 cubic feet per second
O'Neill Pumping Plant	6,000	700 cubic feet per second
Gianelli Pumping Plant	63,000	1,375 cubic feet per second

Source: Reclamation 2010

Semitropic has 105 wells (district-owned and farmer-owned) that are used to pump groundwater into the California Aqueduct for return of banked water to its banking partners. Ninety-five of these wells are electric (all district-owned wells are electric), eight are diesel, and two are natural gas. The return of banked water to Tracy would require the use of four wells to deliver water to the Aqueduct for use by DWR. Although, it is likely that the wells used for the return of Tracy's banked water would be electric, emission calculations are based on the use of 300 horsepower diesel engines as a worst-case scenario (Table 3-11). Water would then be exchanged and delivered to Tracy from the electric pumps at Jones Pumping Plant.

**Table 3-11 Calculated Project Emissions**

Pollutant	Federal Status	<i>de minimis</i> (Tons/year)	Calculated project emissions (Tons/year)
VOC (as an ozone precursor)	Nonattainment serious 8-hour ozone	50	0.8
NO <sub>x</sub> (as an ozone precursor)	Nonattainment serious 8-hour standard	50	7.9
PM <sub>10</sub>	Attainment	100	Not calculated
CO	Attainment	100	Not calculated

Source: SJVAPCD 2010; 40 CFR 93.153

Air quality emissions from electrical power have been considered in environmental documentation for the generating power plant. There are no emissions from electrical engines. Calculated project emissions for the return of Tracy's banked water are well below the SJVAPCD's *de minimis* thresholds for VOC and NO<sub>x</sub> (Table 3-11); therefore, there would be no impact on air quality and a conformity analysis is not required.

### **Cumulative Impacts**

As the emissions for the movement of returned water to Tracy would be well below the *de minimis* threshold for the SJVAPCD, there would be no cumulative impacts to air quality.

## **3.9 Global Climate**

Climate change refers to significant change in measures of climate (e.g., temperature, precipitation, or wind) lasting for decades or longer. Many environmental changes can contribute to climate change [changes in sun's intensity, changes in ocean circulation, deforestation, urbanization, burning fossil fuels, etc.] (EPA 2010a)

Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). Some GHG, such as carbon dioxide (CO<sub>2</sub>), occur naturally and are emitted to the atmosphere through natural processes and human activities. Other GHG (e.g., fluorinated gases) are created and emitted solely through human activities. The principal GHG that enter the atmosphere because of human activities are: CO<sub>2</sub>, methane, nitrous oxide, and fluorinated gasses (EPA 2008a).

During the past century humans have substantially added to the amount of GHG in the atmosphere by burning fossil fuels such as coal, natural gas, oil and gasoline to power our cars, factories, utilities and appliances. The added gases, primarily CO<sub>2</sub> and methane, are enhancing the natural greenhouse effect, and likely contributing to an increase in global average temperature and related climate changes. At present, there are uncertainties associated with the science of climate change (EPA 2010b).

### **3.9.1 Affected Environment**

More than 20 million Californians rely on the SWP and CVP. Increases in air temperature may lead to changes in precipitation patterns, runoff timing and volume, sea level rise, and changes in the amount of irrigation water needed due to modified evapotranspiration rates. These changes may lead to impacts to California's water resources and project operations.



While there is general consensus in their trend, the magnitudes and onset-timing of impacts are uncertain and are scenario-dependent (Anderson et al. 2008).

### 3.9.2 Environmental Consequences

#### 3.9.2.1 No Action

There would be no impacts to global climate change as conditions would remain the same as existing conditions under this alternative.

#### 3.9.2.2 Proposed Action

Delivery of Tracy's CVP water to Semitropic would require the use of electric pumps from the Jones Pumping Plant, the O'Neill Pumping Plant, and the Gianelli Pumping Plant (Table 3-9 for project details). In addition, return of the banked water would utilize four wells in Semitropic and the Jones Pumping Plant. Calculated CO<sub>2</sub> emissions can be found in Table 3-12.

**Table 3-12 Calculated CO<sub>2</sub> Emissions**

Facility	Purpose of Use	Amount of Water Moved	Annual Kilowatt Hours	CO <sub>2</sub> emissions (metric tons)
Jones Pumping Plant	Delivery of banked water	10,500 AF	9,939	7.1
O'Neill Pumping Plant	Delivery of banked water	10,500 AF	10,890	7.8
Gianelli Pumping Plant	Delivery of banked water	10,500 AF	5,544	4.0
Semitropic Wells	Return of banked water	3,500 AF	8,470	6.1
Jones Pumping Plant	Return of banked water	3,500 AF	3,313	2.4
<b>Total</b>				<b>27.4</b>

Source: EPA 2010c

Calculated CO<sub>2</sub> emissions are well below the Environmental Protection Agency's threshold for annually reporting GHG emissions (25,000 metric tons/year), which is a surrogate for a threshold of significance (EPA 2009). Accordingly, the Proposed Action would result in below *de minimis* impacts to global climate change.

#### 3.9.2.3 Cumulative Impacts

GHG emissions are considered cumulatively significant; however, the estimated CO<sub>2</sub> emissions from annual generation of electricity required to bank and return banked water for the Proposed Action is roughly 27.4 metric tons per year, which is well below the 25,000 metric tons per year threshold for reporting GHG emissions. As a result, the Proposed Action is not expected to contribute to cumulative adverse impacts to global climate change.

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## **Section 4 Consultation and Coordination**

### **4.1 Public Review Period**

Reclamation posted the Draft EA and Draft Finding of No Significant Impact for public review and comment on Reclamation's website. The public review period began October 18, 2010 and ended on November 16, 2010. No comments were received during the public comment period.

### **4.2 Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.)**

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources. The amendments enacted in 1946 require consultation with the U.S. Fish and Wildlife Service and State fish and wildlife agencies "whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under Federal permit or license". Consultation is to be undertaken for the purpose of "preventing the loss of and damage to wildlife resources".

The Proposed Action does not involve any new impoundment or diversion of waters, channel deepening, or other control or modification of a stream or body of water as described in the statute. Water for banking and return to Tracy would be moved through existing facilities. Consequently, Reclamation has determined that FWCA does not apply.

### **4.3 Endangered Species Act (16 U.S.C. § 1531 et seq.)**

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

Reclamation has determined that there would be no effect to federally listed species from the Proposed Action. The diversion of this water would not change pumping conditions in the Delta to protect fish. Reclamation and DWR would continue to make decisions whether to pump and convey water based on external conditions independent of the Proposed Action. Water is pumped from the Delta in accordance with the biological opinions governing the long-term operations of the south Delta pumps and other regulatory requirements to protect fish and water quality resources. Similar amounts of water are pumped and conveyed by Reclamation and DWR based on demands and capacity.

The Proposed Action would not result in native lands or lands fallowed and untilled for three or more years being converted or cultivated with CVP water within Semitropic. No unbuilt portion of the SWRU would be utilized.

Any future effects due to development that may use this banked water would be addressed by Tracy through the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan under Section 10 of the ESA.

#### **4.4 National Historic Preservation Act (16 U.S.C. § 470 et seq.)**

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

Section 106 of the NHPA requires federal agencies to consider the effects of federal undertakings on historic properties, properties determined eligible for inclusion in the National Register. Compliance with Section 106 follows a series of steps that are designed to identify interested parties, determine the APE, conduct cultural resource inventories, determine if historic properties are present within the APE, and assess effects on any identified historic properties.

The Proposed Action is an undertaking as described in Section 301(7) of the NHPA, initiating Section 106 of the NHPA and its implementing regulations at 36 CFR Part 800. All banking transfers would occur through existing facilities and water would be provided within existing service area boundaries to areas that currently use water. The action would not result in modification of any existing facilities, construction of new facilities, change in land use, or growth and, as a result, the proposed undertaking would result in no impacts to cultural resources and consultation with the State Historic Preservation Officer is not required.

#### **4.5 Migratory Bird Treaty Act (16 U.S.C. § 703 et seq.)**

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

The Proposed Action as described in Section 1.3 (Scope) and Section 2.2 (Proposed Action) would have no effect on migratory birds as the federal action would not result in modification of any existing facilities, construction of new facilities, or change in land use. The use of banked

water for future development within Tracy's service area is unknown, speculative, and outside Reclamation's jurisdiction and authority.

## **4.6 Executive Order 11988 – Floodplain Management and Executive Order 11990-Protection of Wetlands**

Executive Order 11988 requires Federal agencies to prepare floodplain assessments for actions located within or affecting flood plains, and similarly, Executive Order 11990 places similar requirements for actions in wetlands. The Proposed Action would not affect either concern.

## **4.7 Clean Air Act (42 U.S.C. § 7506 (C))**

Section 176 of the CAA requires that any entity of the Federal government that engages in, supports, or in any way provided financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable SIP required under Section 110 (a) of the CAA (42 USC § 7401 (a)) before the action is otherwise approved. In this context, conformity means that such federal actions must be consistent with a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of those standards. Each federal agency must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements will, in fact conform to the applicable SIP before the action is taken. As described in Section 3.8, the Proposed Action would result in emissions well below the SJVAPCD's *de minimis* thresholds; therefore a conformity analysis is not required and there are no adverse impacts to air quality associated with the Proposed Action.

## **4.8 Clean Water Act (16 U.S.C. § 703 et seq.)**

### **Section 401**

Section 401 of the Clean Water Act (CWA) (33 U.S.C. § 1311) prohibits the discharge of any pollutants into navigable waters, except as allowed by permit issued under Sections 402 and 404 of the CWA (33 U.S.C. § 1342 and 1344). If new structures (e.g., treatment plants) are proposed, that would discharge effluent into navigable waters, relevant permits under the CWA would be required for the project applicant(s). Section 401 requires any applicant for an individual U. S. Army Corps of Engineers dredge and fill discharge permit to first obtain certification from the state that the activity associated with dredging or filling will comply with applicable state effluent and water quality standards. This certification must be approved or waived prior to the issuance of a permit for dredging and filling.

No pollutants would be discharged into any navigable waters under the Proposed Action so no permits under Section 401 of the CWA are required.

### **Section 404**

Section 404 of the CWA authorizes the U. S. Army Corps of Engineers to issue permits to regulate the discharge of "dredged or fill materials into waters of the United States" (33 U.S.C. § 1344). No activities such as dredging or filling of wetlands or surface waters would be required

for implementation of the Proposed Action, therefore permits obtained in compliance with CWA section 404 are not required.

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**FINAL ENVIRONMENTAL ASSESSMENT**

*CITY OF TRACY LONG-TERM GROUNDWATER BANKING PROGRAM WITH  
SEMITROPIC WATER STORAGE DISTRICT*

**Appendix A**

**Delta-Mendota Canal Water Quality Monitoring Program**

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May 2011



# RECLAMATION

*Managing Water in the West*

## **2010 Delta-Mendota Pump-in Program Water Quality Monitoring Plan**



U.S. Department of the Interior  
Bureau of Reclamation  
Mid-Pacific Region

Revised: 20 January 2010

### **Mission Statements**

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

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

## List of Abbreviations and Acronyms

Authority	San Luis and Delta-Mendota Water Authority
°C	degrees Celsius
DMC	Delta-Mendota Canal
DMC Headworks	DMC Milepost 2.5, Jones Pumping Plant
DMC Check 13	DMC Milepost 70, O'Neill Forebay
DMC Check 20	DMC Milepost 111, near Firebaugh
DMC Check 21	DMC Milepost 116, terminus at Mendota Pool
COC	chain of custody
CVP	Central Valley Project
CVRWQCB	Central Valley Regional Water Quality Board
DFG	California Department of Fish and Game
EC	electrical conductivity or specific conductance
Exchange Contractors	San Joaquin River Exchange Contractors Water Authority
°F	degrees Fahrenheit
mg/L	milligrams per liter, equivalent to parts per million
QA	Quality Assurance
QC	Quality Control
QCO	Quality Control Officer
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
USGS	U.S. Geological Survey
ug/L	micrograms per liter, equivalent to parts per billion
uS/cm	microSiemens per cm, salinity in water



# 2010 Delta-Mendota Pump-in Program Water Quality Monitoring Plan

## Introduction

The overall supply of Central Valley Project (CVP) water has been reduced by drought and restrictions on pumping from the Sacramento-San Joaquin Delta. Under the Warren Act of 1911, Reclamation may execute temporary contracts to convey non-project water in the federal Delta-Mendota Canal (DMC) to farms to help sustain crops. Reclamation will also enter into exchange agreements in which groundwater pumped into the DMC will be exchanged with Reclamation for CVP water in San Luis Reservoir and delivered to those districts on the San Luis Canal. Groundwater pumped into the DMC under a Warren Act Contract or an Exchange Agreement makes up the 2010 DMC Pump-in Program. All districts in which the wells reside that pump groundwater into the DMC are participants of the DMC Pump-in Program and must adhere to the monitoring and reporting requirements outlined in this document.

This document describes the plan for measuring the changes in the quality of water in the canal caused by the conveyance of groundwater during 2010, plus changes in groundwater elevation to estimate subsidence. Various agencies will use the data to determine the water quality conditions in the Delta-Mendota Canal, Mendota Pool, and wetlands water supply channels.

This document has been prepared by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), in cooperation with the San Luis & Delta-Mendota Water Authority (Authority), and the San Joaquin River Exchange Contractors Water Authority (Exchange Contractors), with assistance from staff of Banta Carbona Irrigation District, Del Puerto Water District, San Luis Water District, and Panoche Water District. This monitoring plan will be conducted by staff of Reclamation, the Authority, and Water Districts and will complement independent monitoring by other Federal, State, and private agencies.

Several sampling techniques will be used to collect samples of water, including real-time, grab, and composite. The techniques used at each location are summarized in Chapter 3. Autosamplers will be used to collect composite samples at four locations.

Continuous measurement of specific conductance (salinity) will be recorded at four stations in the canal using sondes connected to digital data loggers. The data will be averaged every 15 minutes, sent via satellite to the California Data Exchange Center where it will be posted in the Internet as preliminary data:

<http://cdec.water.ca.gov/queryDaily.html>

Central Valley Operations Office will post the daily average salinity measurements on its website:

<http://www.usbr.gov/mp/cvo/wqrpt.html>

The real-time data will be collected daily by Reclamation and used in a mass balance to calculate and predict water quality conditions. The calculated results will be reported to various agencies, and compared with independent field measurements collected by the Reclamation, the Exchange Contractors, US Geological Survey, and California Regional Water Quality Control Board - Central Valley Region.

Reclamation will use the data to assess changes in water quality and groundwater conditions caused by the 2010 DMC Pump-in Program, and will implement the terms and conditions of the 2010 Warren Act Contracts, exchange agreements, and the 15 January 2010 Letter from the Exchange Contractors to Reclamation (Appendix A).

## **Background**

The Delta Division of the federal Central Valley Project (CVP) delivers water to almost a million acres of farmland in the San Joaquin Valley of California. The CVP is also the sole source of clean water for state and federal wildlife refuges and private wetlands in Fresno, Merced, San Joaquin, and Stanislaus Counties.

The source of water for the Delta Division is delta of the Sacramento and San Joaquin Rivers. This water is suitable in quality for irrigation and wetlands. The region is regularly affected by droughts that reduce the supply of water for the region. Environmental regulations also restrict the operation of the Jones Pumping Plant. The salinity of water in the Delta is variable due to the influence of tides and outflow of river water.

The Delta-Mendota Canal (DMC) carries CVP water to farms, communities, and wetlands between Tracy and Mendota. The 116 mile canal is operated and maintained by the Authority under contract with Reclamation.

Under normal conditions, Reclamation delivers approximately 3 million acre-feet of water within the Authority's service area. Of this amount, 2.5 million acre-feet are delivered to agricultural lands, 150,000 to 200,000 acre-feet for municipal and industrial uses, and between 250,000 to 300,000 acre-feet are delivered to wildlife refuges for habitat enhancement and restoration.

The districts in the Delta Division use groundwater to supplement their contractual supply from the CVP. Three districts have riparian rights to water in the San Joaquin River. These other supplies of water are called "Non-Project Water" because they have not been appropriated by the United States for the purposes of the CVP.

The Warren Act of 1911<sup>(1)</sup> authorizes Reclamation to execute temporary contracts to impound, store, and carry water in federal irrigation canals when excess capacity is available. Reclamation will also execute exchange agreements per CVPIA<sup>2</sup> in which Reclamation exchanges CVP water in San Luis Reservoir delivered to districts on the San Luis Canal for groundwater pumped into the DMC - bucket for bucket exchange. Such contracts and exchange agreements have been negotiated by Reclamation with local water districts to allow the introduction of non-project water into federal canals during droughts to supplement the diminished supply of CVP water. This has helped farmers deliver enough water to irrigate and sustain valuable permanent crops like grapes, citrus, and deciduous fruit, and to sustain the local multi-billion dollar farming economy.

The quality of local groundwater is variable and must be measured to confirm that there will be no harm to downstream water users when the non-project water is pumped into the canal. Reclamation has developed a set of standards for the acceptance of non-project water in the Delta-Mendota Canal.

This Monitoring Plan will ensure that monitoring data will measure any changes in the quality of CVP water in the DMC and Mendota Pool.

In 2010, environmental regulations and climate change have reduced the supply of surface water for the Central Valley Project. This has forced water managers to depend on groundwater to supplement surface water for irrigation. However, continuous pumping of groundwater can quickly reduce local aquifers and can cause irreversible damage to facilities through subsidence.

In 2010, Reclamation will require more detailed information about each source of groundwater and more monitoring of the aquifer to measure overdraft, prevent subsidence, and determine the feasibility of continuing this program in the future. Staff from the Authority and water districts will be required to take regular measurements of depth to groundwater, pump rates, and in-stream salinity measurements.

### **Monitoring Mission and Goals**

The mission of this monitoring program is to produce physical measurements that will determine the changes in the quality of the water in canal caused by the conveyance of groundwater during 2010. The data will be used to implement the terms of the 2010 Warren Act Contracts and exchange agreements, and to ensure that the quality of CVP water is commensurate with the needs and expectations of water users.

### **Program Goals**

The general goals of monitoring are:

- Evaluate the quality of water in each well, and

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<sup>1</sup> Act of February 21, 1911, ch. 141, 36 Stat. 925

<sup>2</sup> Section 3405(a) of the Central Valley Project Improvement Act (CVPIA) (Title 34 of Public Law 102-575)

- Confirm that the blend of CVP water and groundwater is suitable for domestic, agricultural, and wetlands uses.
- Provide reliable data for regulation of the 2010 DMC Pump-in Program to prevent contamination problems
- Provide measurements of groundwater dynamics (depth, recharge) to identify overdraft and subsidence

## Study Area

The Study Area for this program encompasses the Delta-Mendota Canal from Tracy to Mendota, and the Mendota Pool. The canal is divided into two reaches in relation to the O'Neill Forebay and the connection to the State Water Project.

## Water Quality Standards

Non-project water must meet the standards listed in Tables 6 and 7. The lists have been developed by Reclamation to measure constituents of concern that would affect downstream water users. In particular, the concentration of selenium in any pump-in water shall not exceed 2 ug/L, the limit for the Grasslands wetlands water supply channels specified in the 1998 Basin Plan.<sup>3</sup> The salinity of each source of pump-in water shall not exceed 1500 mg/L TDS.

## Water Quality Monitoring Plan

### In-stream Monitoring

The locations of stations for this water quality monitoring plan are summarized in Tables 1, 2, and 3.

**Table 1. Real-Time Monitoring Stations**

Location	Responsible Agency	Parameters	Frequency	Remarks
DMC Headworks	CVO	EC	Real-time	CDEC Site: DMC
DMC Milepost 70 (Check 13)	CVO	EC	Real-time	CDEC site : ONI
DMC Milepost 111.3 (Check 20)	CVO	EC	Real-time	CDEC site : DM2
DMC Milepost 116.5 (Check 21)	CVO	EC	Real-time	CDEC site : DM3

Key:

CDEC: California Data Exchange Center

CVO: Central Valley Operations Office

<sup>3</sup> California Regional Water Quality Control Board, Central Valley Region, Fourth Edition of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins.



**Table 2. Water Quality Monitoring Stations**

<b>Location</b>	<b>Responsible Agency</b>	<b>Parameters</b>	<b>Frequency</b>	<b>Remarks</b>
DMC Milepost 3.46	Reclamation	EC, selenium	Daily composite	Autosampler
DMC Milepost 68 (McCabe Road)	Reclamation	Various	Monthly	Grab sample
DMC Milepost 70 (Check 13)	Reclamation	EC, selenium	Daily composite	Autosampler
DMC Milepost 97.7 (Russell Ave)	Reclamation	EC, selenium, boron, mercury	Monthly	Grab sample
DMC Milepost 110.1 (Washoe Ave)	Reclamation	EC, selenium, boron, mercury	Monthly	Grab sample
DMC Milepost 116.5 (Check 21)	Reclamation	EC, selenium	Daily composite	Autosampler
Mendota Pool (CCID Main Canal at Bass Ave)	Reclamation	EC, selenium	Daily composite	Autosampler

Key:

Reclamation: MP-157 Environmental Monitoring Branch

**Table 3. In-Stream Monitoring Stations**

<b>Location</b>	<b>Responsible Agency</b>	<b>Parameters</b>	<b>Frequency</b>	<b>Remarks</b>
DMC Milepost 16.2 (Check 2)	SLDMWA	EC	Weekly	Grab sample
DMC Milepost 20.6 (Check 3)	SLDMWA	EC	Weekly	Grab sample
DMC Milepost 34.4 (Check 6)	SLDMWA	EC	Weekly	Grab sample
DMC Milepost 38.7 (Check 7)	SLDMWA	EC	Weekly	Grab sample
DMC Milepost 48.6 (Check 9)	SLDMWA	EC	Weekly	Grab sample
DMC Milepost 64.0 (Check 12)	SLDMWA	EC	Weekly	Grab sample
DMC Milepost 85.1 (Check 16)	SLDMWA	EC	Weekly	Grab sample
DMC Milepost 100.9 (Telles Bridge)	SLDMWA	EC	Weekly	Grab sample

Key:

SLDMWA: San Luis and Delta-Mendota Water Authority

## **Wellhead Monitoring**

### **Initial Analysis**

All districts participating in the DMC Pump-in Program must provide the following information about each well to Reclamation prior to pumping groundwater into the DMC:

- the location of each well, pumping rate, and point of discharge in to the DMC;
- complete water quality analyses (Table 6 or 7)<sup>4</sup>
- the depth to groundwater in every well before pumping into the DMC commences.

The recommended summary forms for each well are included as Appendix 2.

Though most of the wells are privately owned, the Districts participating in the DMC pump-in program must provide access to each well for Reclamation and Authority staff.

Reclamation staff will review the analytical results and notify the District which wells may pump into the DMC in 2010. All water samples must be sampled and preserved according to established protocols in correct containers. Analyses should be conducted by laboratories that have been approved by Reclamation (Table 7). Each sample of well water must be measured at the expense of the well owner.

Through the year, Reclamation will collect samples from various wells to confirm initial measurements. The costs of these tests will be paid by Reclamation.

## **Compliance Monitoring**

### **Daily Salinity**

Mean daily salinity will be assessed with in-situ sensors along the canal that report real-time data to CDEC, listed in Table 1.

### **Weekly Monitoring**

Each week, SLDMWA staff will measure the EC of water in the canal at the places listed in Table 3. In addition, SLDMWA staff will measure the EC of the water in each active well that is pumping into the DMC. These measurements will be sent to Reclamation at the end of each week.

### **Selenium Monitoring**

Reclamation will continue to measure selenium in the canal and Mendota Pool with autosamplers listed in Table 2. Reclamation may collect samples of water from various active wells; the cost of these tests will be borne by Reclamation.

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<sup>4</sup> Note: Laboratory analyses of water in each well may be measured within three years

## Data Compilation and Review

All compliance monitoring data collected by the Authority (i.e., flow and EC of water from each active well, EC in the DMC) will be entered into worksheets and presented each week to Reclamation.

## Water Quality Monitoring Parameters and Data Management

The following sections describe the parameters for real-time and laboratory measurement of water quality, as well as methods for quality control, data management, and data reporting.

### Real-Time Water Quality Monitoring Parameters

Methods of measurement, along with range, resolution, and accuracy of specified sensors are provided in Table 4.

#### Salinity

Salinity is a measure of dissolved solids in water. It is the sum weight of many different elements within a given volume of water, reported in milligrams per liter (mg/L) or parts per million (ppm). Salinity is an ecological factor of considerable importance, influencing the types of organisms that live in a body of water. Also, salinity influences the kinds of plants and fish that will grow in a water body. Salinity can be estimated by measuring the electrical conductivity (EC) of the water.

Central Valley Operations Office developed this conversion factor for estimating Total Dissolved Solids (TDS) from EC:

$$\text{TDS (mg/L)} = \text{EC (uS/cm)} * 0.618 + 16$$

Table 4. Real-Time Monitoring Physical Parameters

Parameter	Salinity – Specific Conductance
Method	Conductivity meter (YSI 6600 sonde)
Range	0 to 100 mS/cm
Resolution	0.001 to 0.1 mS/cm (range-dependent)
Accuracy	± 0.5%, ±0.1 mS/cm

## **Sampling For Laboratory Analyses of Water Quality**

The following sections describe constituents for laboratory analyses of water quality, as well as methods for water quality sampling and chain of custody documentation.

### **Constituents**

Table 5 and 6 are lists of constituents to be measured at in each well that will pump into the DMC during 2010. Parameters include selenium, mercury, boron, nutrients, and other compounds that cannot be measured with field sensors.

### **Sampling methods**

Grab samples will be collected in a bucket or bottle from the point of discharge into the canal. Samples of canal water should be collected mid-stream from a bridge or check structure. Grab samples should be poured directly into sample bottles appropriate to the analyses. This technique is for samples collected weekly or less frequently. Reclamation will specify the sample volume, type of bottle, need for preservative, and special handling requirements. Reclamation will train field staff on proper sample collection and handling.

Time composite samples will be collected by Reclamation using an autosampler. Daily composite samples will consist of up to eight subsamples taken per day and mixed into one sample. Weekly composite samples will consist of seven daily subsamples mixed into one sample.

### **Chain of Custody documentation**

Chain of custody (COC) forms will be used to document sample collection, shipping, storage, preservation, and analysis. All individuals transferring and receiving samples will sign, date, and record the time on the COC that the samples are transferred.

Laboratory COC procedures are described in each laboratory's Quality Assurance Program Manual. Laboratories must receive the COC documentation submitted with each batch of samples and sign, date, and record the time the samples are transferred. Laboratories will also note any sample discrepancies (e.g., labeling, breakage). After generating the laboratory data report for the client, samples will be stored for a minimum of 30 days in a secured area prior to disposal.

### **Quality Control**

Reclamation will assign staff to verify the accuracy of all measurements for this program.

Quality control (QC) is the overall system of technical activities that measure the attributes and performance of a process, item, or service against defined standards to verify that stated requirements are met.

Quality assurance (QA) is an integrated system of management activities involving, planning, implementation, documentation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the customer.

QA objectives will be used to validate the data for this project. The data will be accepted, rejected, or qualified based on how sample results compare to established acceptance criteria.

The precision, accuracy, and contamination criteria will be used by the QCO to validate the data for this project. The criteria will be applied to the blind external duplicate/split, blank, reference, or spiked samples submitted with the production samples to the analytical laboratories by the participating agencies to provide an independent assessment of precision, accuracy, and contamination.

Laboratories analyze their own QC samples with the client's samples. Laboratory QC samples, including laboratory fortified blanks, matrix spikes, duplicates, and method blanks, assess precision, accuracy, and contamination. Laboratory QC criteria are stated in the analytical methods or determined by each laboratory. Since internal control ranges are often updated in laboratories based on instrumentation, personnel, or other influences, it is the responsibility of the QCO to verify that these limits are well documented and appropriately updated during system audits. The preferred method of reporting the QC results is for the laboratory to provide a QC summary report with acceptance criteria for each QC parameter of interest.

For water samples, the QCO will use a statistical program to determine if current concentrations for parameters at given sites are consistent with the historical data at these sites. A result is determined to be a historical outlier if it is greater than 3 standard deviations from the average value for the site. The presence of an outlier could indicate an error in the analytical process or a significant change in the environment.

Samples must be prepared, extracted, and analyzed within the recommended holding time for the parameter. Data may be qualified if the sample was analyzed after the holding time expires.

Completeness refers to the percentage of project data that must be successfully collected, validated, and reported to proceed with its intended use in making decisions.

Constraints with regard to time, money, safety, and personnel were some of the factors in choosing the most representative sites for this project. Monitoring sites have been selected by considering the physical, chemical, and biological boundaries that define the system under study.

Sites also were selected to be as representative of the system as possible. However, Reclamation will continue to evaluate the choice of the sites with respect to their representativeness and will make appropriate recommendations to the Contracting Officer given a belief or finding of inadequacy.

Comparability between each agency's data is enhanced through the use of Standard Operating Procedures that detail methods of collection and analysis. Each agency has chosen the best available protocol for the sampling and analyses for which it is responsible based on the agency's own expertise. Audits performed by the QCO will

reinforce the methods and practices currently in place and serve to standardize techniques used by the agencies.

### **Data Management**

This program will use data from several independent sources. Each collecting agency will be responsible for its data reduction (analysis), internal data quality control, data storage, and data retrieval.

Real-Time Data – Raw data from field sensors, must be identified as preliminary, subject to change

Provisional Data - Data that have been reviewed by the collecting agency but may be changed pending re-analyses or statistical review

Laboratory Data – Data produced by the laboratory following laboratory QA/QC protocols

### **Data Reporting**

Data will be used by Reclamation in a water balance model to predict water quality changes in the DMC with the addition of groundwater. Real-time data will be used to monitor day-to-day patterns and assess actual conditions. The real-time data will be posted in weekly e-mail messages to the districts and Authority. Reclamation will compile all data into a final report.

### **Data Interpretation**

Reclamation staff will compile all flow and water quality data for the canal and all wells pumping into the canal. The real-time flow and EC data for the DMC sites will be entered into a water quality mass balance worksheet developed by Reclamation, the Authority, and Exchange Contractors to predict the change in salinity in the canal with the addition of groundwater.

Reclamation will direct the Authority and the Districts to stop pumping groundwater into the upper DMC if the concentration of these constituents in the canal exceed the maximum concentrations listed in Table 5.

Table 5. Maximum Allowable Concentration of Seven Constituents in the Upper DMC

Constituent	Maximum concentration in the DMC
Arsenic	10 ug/L
Boron	0.7 mg/L
Nitrates as N	45 mg/L
Selenium	2 ug/L
Specific conductance (EC)	1,200 uS/cm
Sulfates	250 mg/L
Total Dissolved Solids	800 mg/L

Each week, Reclamation staff will use the real-time salinity measurements (Table 1) and weekly in-stream measurements (Table 3) to monitor and determine the changes in water quality caused by the conveyance of groundwater in the DMC. Reclamation will direct the Authority and the Districts to stop pumping groundwater into the lower DMC if:

- the additional groundwater is causing an increase of 30 mg/L in TDS between Check 13 and 20, or
- the TDS of water in the canal exceeds 450 mg/L, measured at Check 20.

Revised: 20 Jan 2010

**Table 6. Water Quality Standards for Acceptance of Groundwater into the Delta-Mendota Canal Headworks to Check 13 (O'Neill Forebay)**

Constituent	Units	Maximum Contaminant Level		Detection Limit for Reporting		CAS Registry Number	Recommended Analytical Method
<b>Primary</b>							
Aluminum	mg/L	1	(1)	0.05	(2)	7429-90-5	EPA 200.7
Antimony	mg/L	0.006	(1)	0.006	(2)	7440-36-0	EPA 200.8
Arsenic	mg/L	0.05	(1)	0.002	(2)	7440-38-2	EPA 200.8
Barium	mg/L	1	(1)	0.1	(2)	7440-39-3	EPA 200.7
Beryllium	mg/L	0.004	(1)	0.001	(2)	7440-41-7	EPA 200.7
Boron	mg/L	0.7	(16)			7440-42-8	EPA 200.7
Cadmium	mg/L	0.005	(1)	0.001	(2)	7440-43-9	EPA 200.7
Chromium (total)	mg/L	0.05	(1)	0.01	(2)	7440-47-3	EPA 200.7
Lead	mg/L	0.015	(9)	0.005	(8)	7439-92-1	EPA 200.8
Mercury (inorganic)	mg/L	0.002	(1)	0.001	(2)	7439-97-6	EPA 245.1
Nickel	mg/L	0.1	(1)	0.01	(2)	7440-02-0	EPA 200.7
Nitrates (as NO3)	mg/L	45	(1)	2	(2)	7727-37-9	EPA 300.1
Nitrate + Nitrite (sum as nitrogen)	mg/L	10	(1)				EPA 353.2
Nitrite (as nitrogen)	mg/L	1	(1)	0.4	(2)	14797-65-0	EPA 300.1
Selenium	mg/L	0.002	(13)			7782-49-2	EPA 200.8
Thallium	mg/L	0.002	(1)	0.001	(2)	7440-28-0	EPA 200.8
<b>Secondary</b>							
Chloride	mg/L	250	(7)			16887-00-6	EPA 300.1
Copper	mg/L	1	(10)	0.05	(8)	7440-50-8	EPA 200.7
Iron	mg/L	0.3	(6)			7439-89-6	EPA 200.7
Manganese	mg/L	0.05	(6)			7439-96-5	EPA 200.7
Molybdenum	mg/L	0.01	(11)			7439-98-7	EPA 200.7
Silver	mg/L	0.1	(6)			7440-22-4	EPA 200.7
Sodium	mg/L	69	(15)			7440-23-5	EPA 200.7
Specific Conductance	µS/cm	2,200	(7)				SM 2510 B
Sulfate	mg/L	250	(7)			14808-79-8	EPA 300.1
TDS	mg/L	1,500	(7)				SM 2540 C
Zinc	mg/L	5	(6)			7440-66-6	EPA 200.7
<b>Radioactivity</b>							
Gross Alpha	pCi/L	15	(3)	3	(3)		SM 7110C
<b>Organic Chemicals</b>							
Atrazine	mg/L	0.001	(4)	0.0005	(5)	1912-24-9	EPA 508.1
Bentazon	mg/L	0.018	(4)	0.002	(5)	25057-89-0	EPA 515
Carbofuran	mg/L	0.018	(4)	0.005	(5)	1563-66-2	EPA 531.1-2
Chlordane	mg/L	0.0001	(4)	0.0001	(5)	57-74-9	EPA 505
Chlorpyrifos	µg/L	0.025	(14)			2921-88-2	EPA 8141
2, 4-D	mg/L	0.07	(4)	0.01	(5)	94-75-7	EPA 515.1-4
Diazinon	µg/L	0.16	(14)			333-41-5	EPA 507
Dibromochloropane (DBCP)	mg/L	0.0002	(4)	0.00001	(5)	96-12-8	EPA 504.1
Endrin	mg/L	0.002	(4)	0.0001	(5)	72-20-8	EPA 505
Ethylene Dibromide (EDB)	mg/L	0.00005	(4)	0.00002	(5)	206-93-4	EPA 504.1
Glyphosate	mg/L	0.7	(4)	0.025	(5)	1071-83-6	EPA 547
Heptachlor	mg/L	0.00001	(4)	0.00001	(5)	76-44-8	EPA 505
Heptachlor Epoxide	mg/L	0.00001	(4)	0.00001	(5)	1024-57-3	EPA 505
Lindane	mg/L	0.0002	(4)	0.0002	(5)	58-89-9	EPA 505
Methoxychlor	mg/L	0.03	(4)	0.01	(5)	72-43-5	EPA 505
Molinate	mg/L	0.02	(4)	0.002	(5)	2212-67-1	EPA 525.2
2, 4, 5-TP (Silvex)	mg/L	0.05	(4)	0.001	(5)	93-72-1	EPA 515.1-4
Simazine	mg/L	0.004	(4)	0.001	(5)	122-34-9	EPA 508.1
Thiobencarb	mg/L	0.07	(4)	0.001	(5)	28249-77-6	EPA 525.2
Toxaphene	mg/L	0.003	(4)	0.001	(5)	8001-35-2	EPA 505



**Table 6. Water Quality Standards for Acceptance of Groundwater into the Delta-Mendota Canal Headworks to Check 13 (O'Neill Forebay)**

Sources:

Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California Health and Safety Code (Sections 4010-4037), and Administrative Code (Sections 64401 et seq.), as amended.

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| (1) Title 22. Table 64431-A (mg/L)   | (6) Title 22. Table 64449-A (mg/L) |
| (2) Title 22. Table 64432-A (mg/L)   | (7) Title 22. Table 64449-B (mg/L) |
| (3) Title 22. Table 64442 (pCi/L)    | (8) Title 22. Table 64678-A (mg/L) |
| (4) Title 22. Table 64444-A (mg/L)   | (9) Title 22. Section 64678 (d)    |
| (5) Title 22. Table 64445.1-A (mg/L) | (10) Title 22. Section 64678 (e)   |

California Regional Water Quality Control Board, Central Valley Region, Fourth Edition of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins.

(13) Basin Plan, Table III-1 (ug/L) (selenium in Grasslands water supply channels)

(14) Basin Plan, Table III-2A (ug/L) (chlorpyrifos & diazinon in San Joaquin River from Mendota to Vernalis)

Ayers, R. S. and D. W. Westcot, *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985).

(15) Ayers, Table 1 (mg/L) (sodium)

(16) Ayers, Table 21 (mg/L) (boron)

revised 03/03/2009 SCC-107

**Table 7. Water Quality Standards for Acceptance of Groundwater into the Delta-Mendota Canal  
Check 13 (O'Neill Forebay) To Check 21 (Mendota Pool)**

Constituent	Units	Maximum Contaminant Level		CAS Registry Number	Recommended Analytical Method
Bicarbonate	mg/L	61	(5)	71-52-3	SM 2320 A
Boron	mg/L	0.7	(3)	7440-42-8	EPA 200.7
Calcium	mg/L	80	(5)	7440-70-2	EPA 200.5
Chloride	mg/L	40	(5)	189689-94-9	EPA 300.1
Chlorpyrifos	µg/L	0.025	(2)	2921-88-2	EPA 8141
Chromium, total	µg/L	50	(1)	7440-47-3	EPA 200.7
Diazinon	µg/L	0.16	(2)	333-41-5	EPA 507
Hardness	mg/L				calculated
Magnesium	mg/L	16	(5)	7439-95-4	EPA 200.5
Mercury	µg/L	2	(1)	7439-97-6	EPA 245.1
Molybdenum	µg/L	10	(3)	7439-98-7	EPA 200.7
Nickel	µg/L	100	(1)	7440-02-0	EPA 200.7
Nitrates (as NO <sub>3</sub> )	mg/L	45	(1)	7727-37-9	EPA 300.1
Nitrite (as nitrogen)	mg/L	1	(1)	14797-65-0	EPA 300.1
pH	units	5.0 - 7.0	(5)		EPA 150.1
Potassium	mg/L	4.5	(5)	7440-09-7	EPA 200.5
SAR		<2	(5)		calculated
Selenium	µg/L	2	(2)	7782-49-2	EPA 200.8
Sodium	mg/L	69	(3)	7440-23-5	EPA 200.7
Specific Conductance	µS/cm	1,230	(4)		SM 2510 B
Sulfate	mg/L	50	(5)	14808-79-8	EPA 300.1
Total Dissolved Solids	mg/L	800	(4)		SM 2540 C

(1) Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California Health and Safety Code (Sections 4010-4037), and Administrative Code (Sections 64401 et seq.), as amended.

(2) California Regional Water Quality Control Board, Central Valley Region, Fourth Edition of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. Table III-2A

(3) Ayers, R. S. and D. W. Westcot, *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985).

(4) Second Amended Contract for Exchange of Waters, No 11r-1144, Article 9. Quality of Substitute Water.

(5) Spectrum Analytic, Inc. Guide to Interpreting Irrigation Water Analysis. Washington C.H., Ohio  
[http://www.spectrumanalytic.com/support/library/rf/A\\_Guide\\_to\\_Interpreting\\_Irrigation\\_Water\\_Analysis.htm](http://www.spectrumanalytic.com/support/library/rf/A_Guide_to_Interpreting_Irrigation_Water_Analysis.htm)

revised 11/23/2009 SCC-107

## Appendix 1. 2010 Letter from Exchange Contractors



Consisting of 240,000 acres on the Westside of the San Joaquin Valley

January 15, 2010

**JAMES E. O'BANION**  
Chairman

**ROY CATANIA**  
Vice Chairman

**STEVE CHEDESTER**  
Executive Director

**LARRY FREEMAN**  
Water Resources Specialist

**JOANN TOSCANO**  
Administrative Assistant

**MINASIAN, SPRUANCE,  
MEITH, SOARES &  
SEXTON LLP**  
Legal Counsel

**VIA EMAIL & U.S. MAIL**

Mr. Michael Jackson  
U.S. Bureau of Reclamation  
1243 N Street  
Fresno, CA 93721-1813

Ms. Frances Mizuno  
San Luis & Delta-Mendota Water Authority  
Post Office Box 2157  
Los Banos, CA 93635

**CENTRAL CALIFORNIA  
IRRIGATION DISTRICT**

**James E. O'Banion**  
President

**Christopher White**  
General Manager

**SAN LUIS CANAL  
COMPANY**

**James L. Nickel**  
President

**Chase Hurley**  
General Manager

**FIREBAUGH CANAL  
WATER DISTRICT**

**Mike Stearns**  
President

**Jeff Bryant**  
General Manager

**COLUMBIA CANAL  
COMPANY**

**Roy Catania**  
President

**Randy Houk**  
General Manager

P.O. Box 2115  
541 H Street  
Los Banos, CA 93635  
(209) 827-8616  
Fax (209) 827-9703  
e-mail: jtoscano@sjrecwa.net  
Website: www.sjrecwa.net

RE: **2010 DMC Pumping**

Dear Michael and Frances:

This letter is to confirm the San Joaquin River Exchange Contractors Water Authority's (Exchange Contractors) approval of your request to continue the DMC pumping program in 2010. As a result of subsidence effects being determined in 2008, this year's program must continue to include that no pumping will be allowed in Management Areas 2 and 3.

As you know, a joint groundwater study between the Central California Irrigation District, the City of Los Banos and the United States Bureau of Reclamation is currently being conducted in the Los Banos aquifer subarea due to significant groundwater concerns. The study and its recommendations are anticipated to be completed in March 2010. Due to the regulatory pumping restrictions that are being implemented on the Jones Pumping Plant, we can appreciate the SLDMWA's need to begin the environmental review process for the 2010 DMC Pumping Program; however, we must reserve the right to amend this approval letter pending the outcome of the joint groundwater study.

The Exchange Contractors' Board approval for this pumping program is based upon the conditions set forth below:

1. Any well that is proposed to pump into the lower DMC must obtain a current water quality analysis. The analysis shall consist of Ag Suitability and selenium, plus any other constituents the U.S. Bureau of Reclamation (USBR) may require. (Wells may be pumped for 24

Mr. Michael Jackson  
Ms. Frances Mizuno  
RE: **2010 DMC Pumping**  
January 15, 2010  
Page 2

hours in order to get the initial sample for water quality testing.) These tests will be conducted on a monthly basis for the duration of the pumping period. From our perspective, pumping may begin once we have received copies of current lab test results for salinity and selenium, recognizing the other constituents may take longer to obtain the lab results.

2. Only wells that test at 1,500 ppm TDS or less at the well head will be allowed.
3. Only wells that test at 2 ppb selenium or less at the well head will be allowed.
4. The calculated degradation caused by the lower DMC wells shall not exceed 30 ppm. (The model developed by USBR during the 2008 and 2009 pumping program shall be used and USBR shall provide at least weekly updates of the reports to the Exchange Contractors.)
5. At any time, the wells in the lower DMC will be shut off if the measured water quality at Check 20 on the DMC exceeds 450 ppm TDS in a single day. The wells may resume pumping after the average water exceedence no longer exists for 3 days. Wells with water quality at the well head of 450 TDS or less would be allowed to continue to pump and would not be subject to this restriction.
6. The water would be credited to the receiving district as a whole, not for specific growers.
7. The wells will only run through February 28, 2011.

If you agree with the program as outlined, and before any additional lower DMC pumping commences, we request that each of your agencies confirm in writing to the program described above. Please contact us if you have any questions regarding this matter.

Sincerely,



Steve Chedester

cc: San Joaquin River Exchange Contractors Members  
Paul Minasian, Esq.

## Appendix 2. Recommended Well Summary Forms

**2010 DMC Pump-in Program  
Summary Sheet**

District:	
Well Operator:	
Well ID	

**Groundwater elevation**

Depth to groundwater	
Date of measurement	

DMC Milepost	
--------------	--

**Water Quality Analysis**

Date of sample	
Lab	
Sample ID:	

**Table A. Water Quality Standards for Acceptance of Groundwater into the Delta-Mendota Canal  
Headworks to Check 13 (O'Neill Forebay)**

District	
Well ID	
DMC Milepost	

Constituent	Units	Maximum Contaminant Level		Detection Limit for Reporting	CAS Registry Number	Recommended Analytical Method	Analytical Results	Units
<b>Primary</b>								
Aluminum	mg/L	1	(1)	0.05	(2) 7429-90-5	EPA 200.7		
Antimony	mg/L	0.006	(1)	0.006	(2) 7440-36-0	EPA 200.8		
Arsenic	mg/L	0.05	(1)	0.002	(2) 7440-38-2	EPA 200.8		
Barium	mg/L	1	(1)	0.1	(2) 7440-39-3	EPA 200.7		
Beryllium	mg/L	0.004	(1)	0.001	(2) 7440-41-7	EPA 200.7		
Boron	mg/L	0.7	(16)		7440-42-8	EPA 200.7		
Cadmium	mg/L	0.005	(1)	0.001	(2) 7440-43-9	EPA 200.7		
Chromium (total)	mg/L	0.05	(1)	0.01	(2) 7440-47-3	EPA 200.7		
Lead	mg/L	0.015	(9)	0.005	(8) 7439-92-1	EPA 200.8		
Mercury (inorganic)	mg/L	0.002	(1)	0.001	(2) 7439-97-6	EPA 245.1		
Nickel	mg/L	0.1	(1)	0.01	(2) 7440-02-0	EPA 200.7		
Nitrates (as NO3)	mg/L	45	(1)	2	(2) 7727-37-9	EPA 300.1		
Nitrate + Nitrite (sum as nitrogen)	mg/L	10	(1)			EPA 353.2		
Nitrite (as nitrogen)	mg/L	1	(1)	0.4	(2) 14797-65-0	EPA 300.1		
Selenium	mg/L	0.002	(13)		7782-49-2	EPA 200.8		
Thallium	mg/L	0.002	(1)	0.001	(2) 7440-28-0	EPA 200.8		
<b>Secondary</b>								
Chloride	mg/L	250	(7)		16887-00-6	EPA 300.1		
Copper	mg/L	1	(10)	0.05	(8) 7440-50-8	EPA 200.7		
Iron	mg/L	0.3	(6)		7439-89-6	EPA 200.7		
Manganese	mg/L	0.05	(6)		7439-96-5	EPA 200.7		
Molybdenum	mg/L	0.01	(11)		7439-98-7	EPA 200.7		
Silver	mg/L	0.1	(6)		7440-22-4	EPA 200.7		
Sodium	mg/L	69	(15)		7440-23-5	EPA 200.7		
Specific Conductance	µS/cm	2,200	(7)			SM 2510 B		
Sulfate	mg/L	250	(7)		14808-79-8	EPA 300.1		
TDS	mg/L	1,500	(7)			SM 2540 C		
Zinc	mg/L	5	(6)		7440-66-6	EPA 200.7		
<b>Radioactivity</b>								
Gross Alpha	pCi/L	15	(3)	3	(3)	SM 7110C		
<b>Organic Chemicals</b>								
Atrazine	mg/L	0.001	(4)	0.0005	(5) 1912-24-9	EPA 508.1		
Bentazon	mg/L	0.018	(4)	0.002	(5) 25057-89-0	EPA 515		
Carbofuran	mg/L	0.018	(4)	0.005	(5) 1563-66-2	EPA 531.1-2		
Chlordane	mg/L	0.0001	(4)	0.0001	(5) 57-74-9	EPA 505		
Chlorpyrifos	µg/L	0.025	(14)		2921-88-2	EPA 8141		



**Table A. Water Quality Standards for Acceptance of Groundwater into the Delta-Mendota Canal Headworks to Check 13 (O'Neill Forebay)**

District  
Well ID  
DMC Milepost

Constituent	Units	Maximum Contaminant Level	Detection Limit for Reporting	CAS Registry Number	Recommended Analytical Method	Analytical Results	Units
2, 4-D	mg/L	0.07 (4)	0.01 (5)	94-75-7	EPA 515.1-4		
Diazinon	µg/L	0.16 (14)		333-41-5	EPA 507		
Dibromochloropane (DBCP)	mg/L	0.0002 (4)	0.00001 (5)	96-12-8	EPA 504.1		
Endrin	mg/L	0.002 (4)	0.0001 (5)	72-20-8	EPA 505		
Ethylene Dibromide (EDB)	mg/L	0.00005 (4)	0.00002 (5)	206-93-4	EPA 504.1		
Glyphosate	mg/L	0.7 (4)	0.025 (5)	1071-83-6	EPA 547		
Heptachlor	mg/L	0.00001 (4)	0.00001 (5)	76-44-8	EPA 505		
Heptachlor Epoxide	mg/L	0.00001 (4)	0.00001 (5)	1024-57-3	EPA 505		
Lindane	mg/L	0.0002 (4)	0.0002 (5)	58-89-9	EPA 505		
Methoxychlor	mg/L	0.03 (4)	0.01 (5)	72-43-5	EPA 505		
Molinate	mg/L	0.02 (4)	0.002 (5)	2212-67-1	EPA 525.2		
2, 4, 5-TP (Silvex)	mg/L	0.05 (4)	0.001 (5)	93-72-1	EPA 515.1-4		
Simazine	mg/L	0.004 (4)	0.001 (5)	122-34-9	EPA 508.1		
Thiobencarb	mg/L	0.07 (4)	0.001 (5)	28249-77-6	EPA 525.2		
Toxaphene	mg/L	0.003 (4)	0.001 (5)	8001-35-2	EPA 505		

**Sources:**

Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California Health and Safety Code

- (1) Title 22. Table 64431-A (mg/L) (6) Title 22. Table 64449-A (mg/L)  
 (2) Title 22. Table 64432-A (mg/L) (7) Title 22. Table 64449-B (mg/L)  
 (3) Title 22. Table 64442 (pCi/L) (8) Title 22. Table 64678-A (mg/L)  
 (4) Title 22. Table 64444-A (mg/L) (9) Title 22. Section 64678 (d)  
 (5) Title 22. Table 64445.1-A (mg/L) (10) Title 22. Section 64678 (e)

Lab:  
Lab ID:  
Sample Date:

California Regional Water Quality Control Board, Central Valley Region, Fourth Edition of the Water Quality Control Plan for  
 (13) Basin Plan, Table III-1 (ug/L) (selenium in Grasslands water supply channels)  
 (14) Basin Plan, Table III-2A (ug/L) (chlorpyrifos & diazinon in San Joaquin River from Mendota to Vernalis)

Ayers, R. S. and D. W. Westcot, *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985).

- (15) Ayers, Table 1 (mg/L) (sodium)  
 (16) Ayers, Table 21 (mg/L) (boron)

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**Table B. Water Quality Standards for Acceptance of Groundwater into the Delta-Mendota Canal  
Check 13 (O'Neill Forebay) To Check 21 (Mendota Pool)**

District	
Well ID	
DMC Milepost	

Constituent	Units	Maximum Contaminant Level		CAS Registry Number	Recommended Analytical Method	Analytical Results	Units
Boron	µg/L	700	(3)	7440-42-8	EPA 200.7		
Chromium, total	µg/L	50	(1)	7440-47-3	EPA 200.7		
Mercury	µg/L	2	(1)	7439-97-6	EPA 245.1		
Molybdenum	µg/L	10	(3)	7439-98-7	EPA 200.7		
Nickel	µg/L	100	(1)	7440-02-0	EPA 200.7		
Nitrates	µg/L	45	(1)	7727-37-9	EPA 300.1		
Selenium	µg/L	2	(2)	7782-49-2	EPA 200.8		
Specific Conductance	µS/cm	1,230	(4)		SM 2510 B		
Total Dissolved Solids	mg/L	800	(4)		SM 2540 C		
Chlorpyrifos	µg/L	0.025	(2)	2921-88-2	EPA 8141		
Diazinon	µg/L	0.16	(2)	333-41-5	EPA 507		

- (1) Title 22. The Domestic Water Quality and Monitoring Regulations specified by the State of California  
 (2) California Regional Water Quality Control Board, Central Valley Region, Fourth Edition of the Water  
 (3) Ayers, R. S. and D. W. Westcot, *Water Quality for Agriculture*, Food and Agriculture Organization of the  
 (4) Second Amended Contract for Exchange of Waters, No I1r-1144, Article 9. Quality of Substitute Water.  
 revised 03/03/2009 SCC-107

Lab:	
Lab ID:	
Sample Date:	

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**FINAL ENVIRONMENTAL ASSESSMENT**

*CITY OF TRACY LONG-TERM GROUNDWATER BANKING PROGRAM WITH  
SEMITROPIC WATER STORAGE DISTRICT*

**Appendix B**

**Calculation of Average Water Quality in Semitropic Water  
Storage District**

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May 2011

## *Semitropic Water Storage District*

### Water Banking Project

2001 Recovery of Previously Stored Water

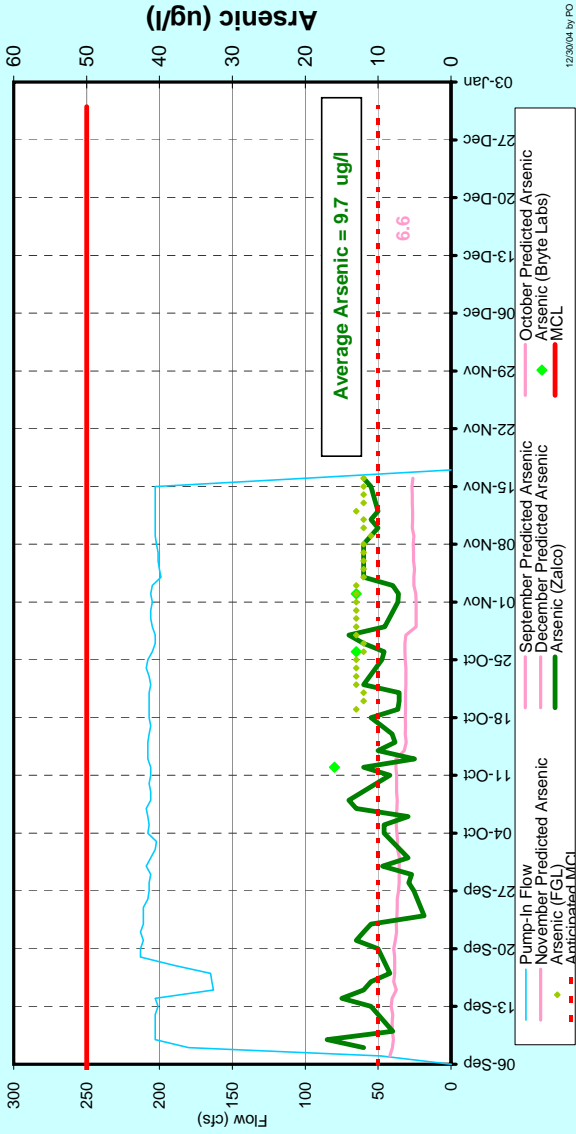
Calculation of Average Water Quality

Source of Water returned from Storage				Arsenic	Bromide	Hexavalent Chromium	Electrical Conductivity	Dissolved/Total Organic Carbon	Nitrate	Sulfate	Total Dissolved Solids	Uranium
Location	Return method	Aqueduct Milepost	H <sub>2</sub> O (acre-feet)	As (ug/l)	Br (ug/l)	Cr <sup>+6</sup> (ug/l)	EC (uS/cm)	DOC/TOC (mg/l)	NO <sub>3</sub> (mg/l)	SO <sub>4</sub> (mg/l)	TDS (mg/l)	U pCi/l
SWSD	Direct Pump-In	209.80	23,276	8.4	340	5.8	631	1.22	4.8	89	408	2.5
Check 21	Entitlement Exchange	172.26	38,450	2.5	260	0.2	522	3.10	2.7	41	291	na
KWBA	Direct Pump-In	238.19	1,614	3.0	160	1.1	374	1.30	7.3	41	240	3.4
<b>Weighted Average of Water Returned</b>			<b>63,340</b>	<b>4.7</b>	<b>287</b>	<b>2.3</b>	<b>558</b>	<b>2.36</b>	<b>3.6</b>	<b>59</b>	<b>333</b>	<b>na</b>
Difference				2.2	27	2.1	36	-0.74	0.9	18	42	na
Maximum Contaminate Level (MCL)				0.0	none	none		none	45.0	250	500	20.0

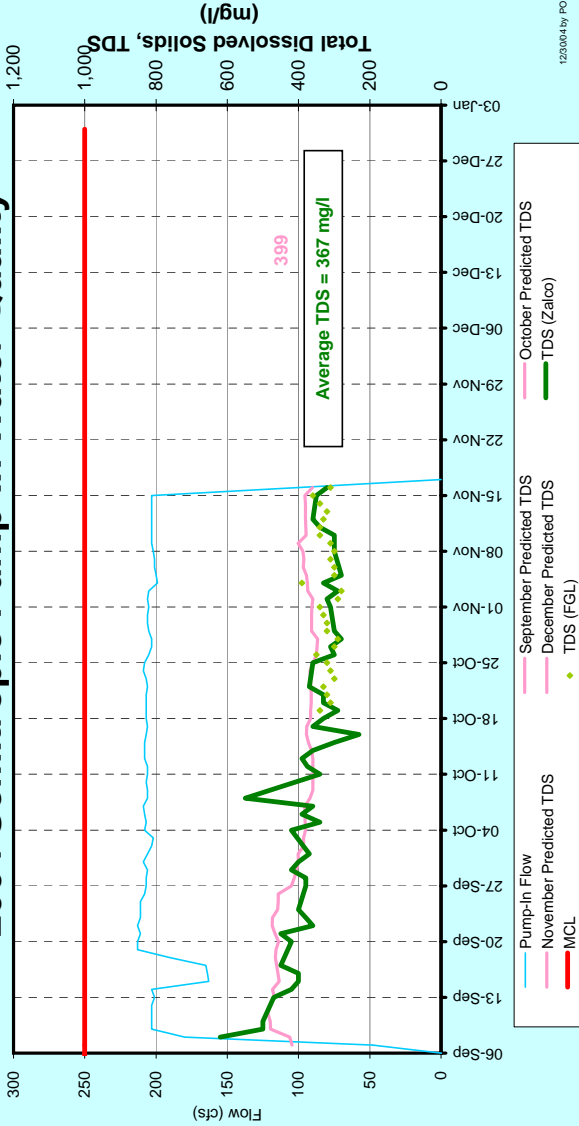
\* Of the 63,340 acre-feet listed as returned above; 31,500 was for MWD, 30,000 was for Santa Clara Valley Water District, 1,807 was for Zone 7 Water District, and 33 reentered Semitropic. Early in the year 1,614 acre-feet was pumped out of Semitropic's share of the Kern Water Bank at a time where there was insufficient demand to use the water within the District.

9/19/02 by PO

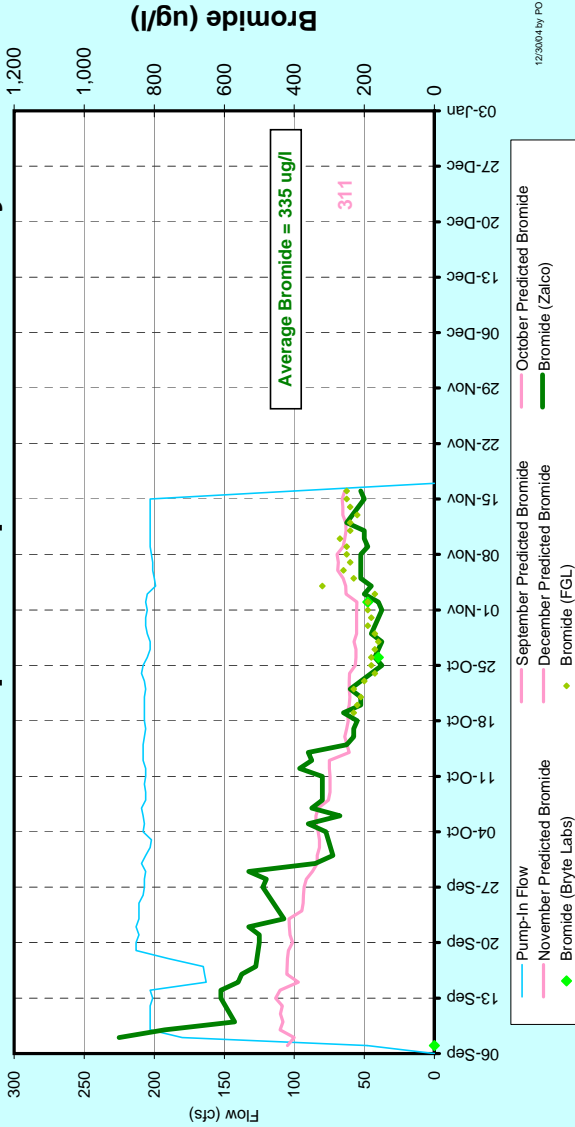
# 2004 Semitropic Pump-In Water Quality



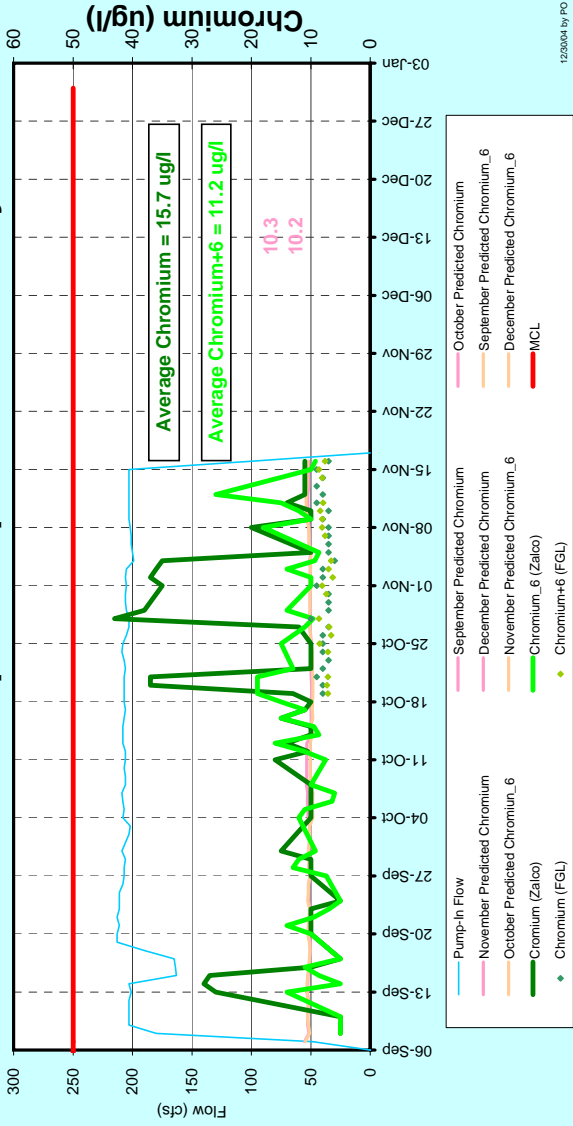
# 2004 Semitropic Pump-In Water Quality



# 2004 Semitropic Pump-In Water Quality

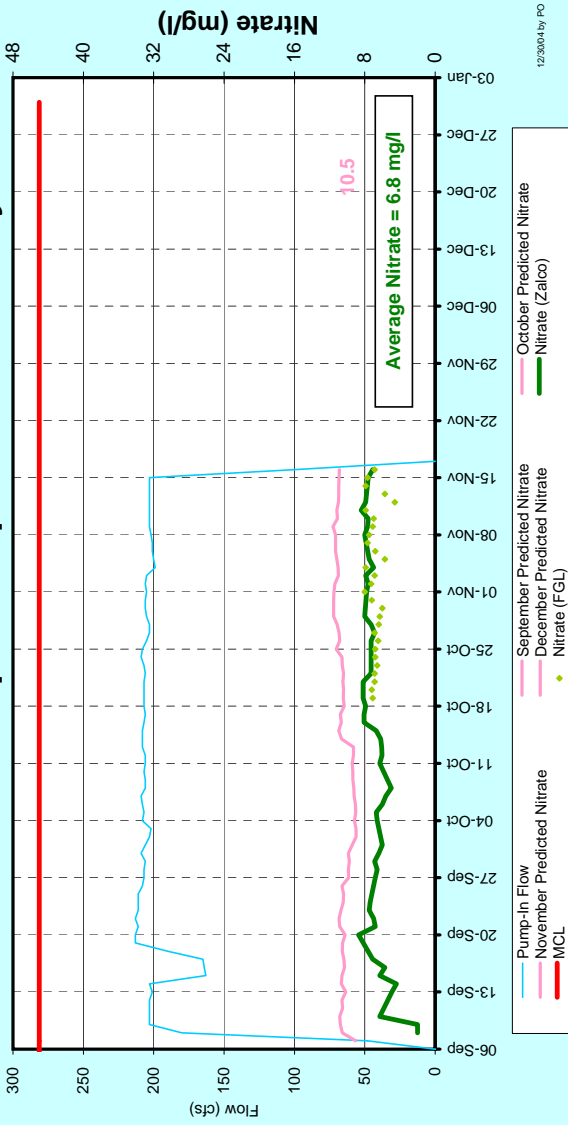


# 2004 Semitropic Pump-In Water Quality

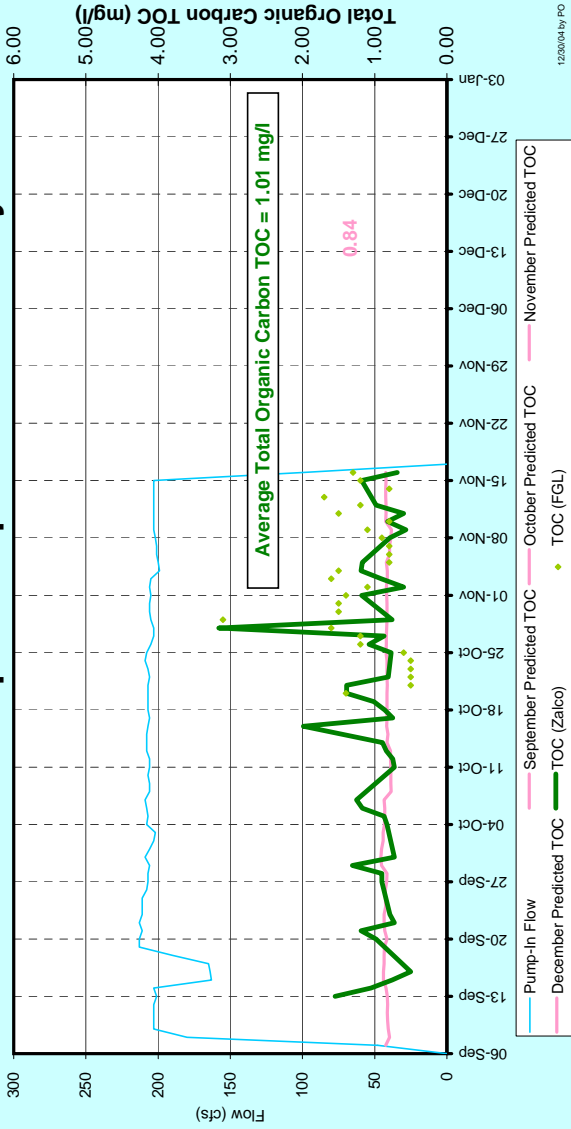




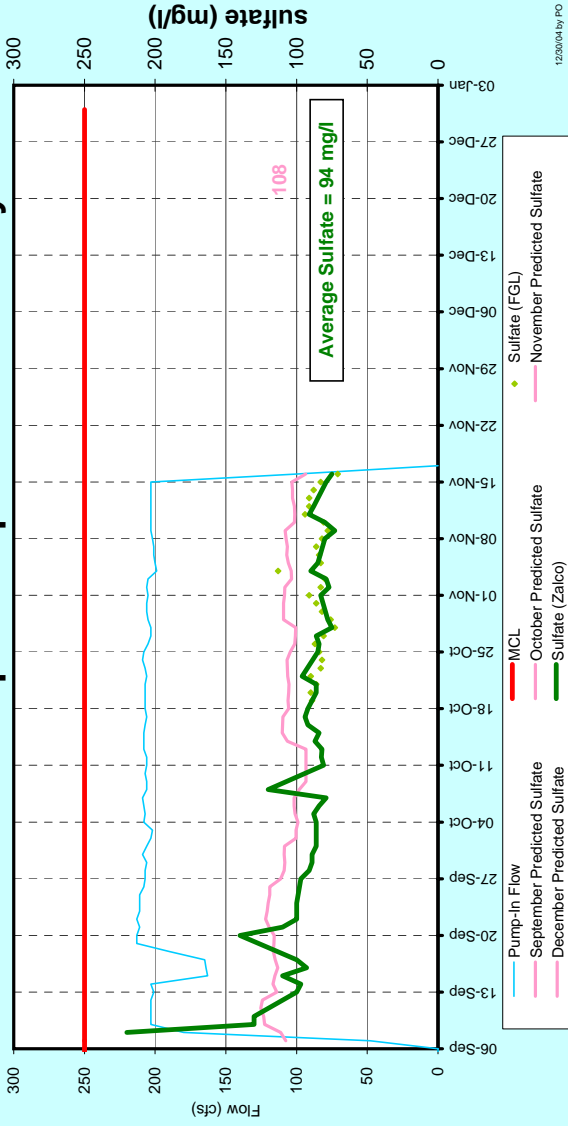
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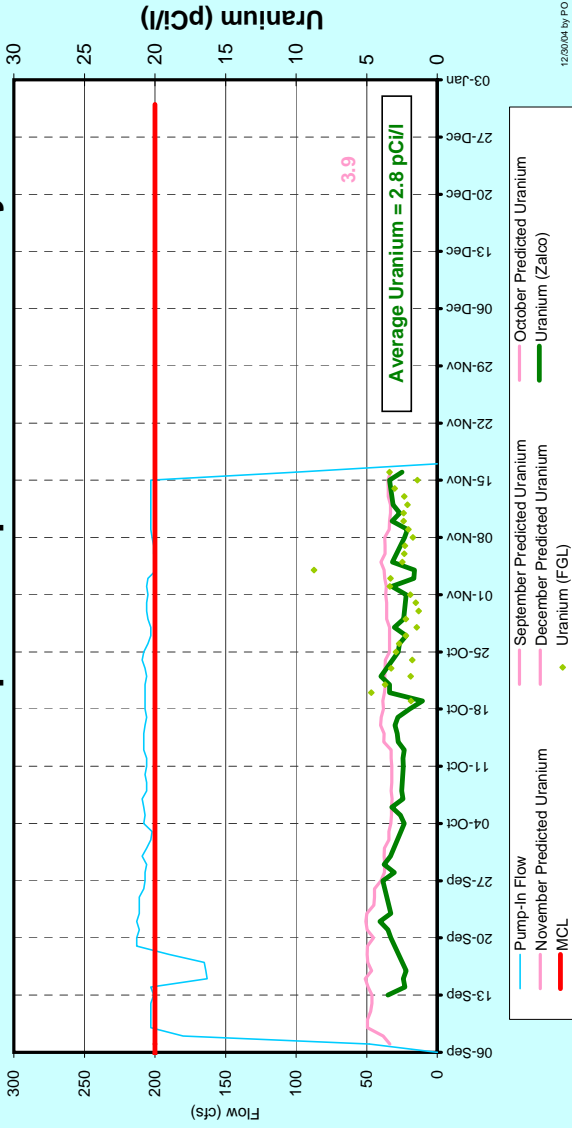
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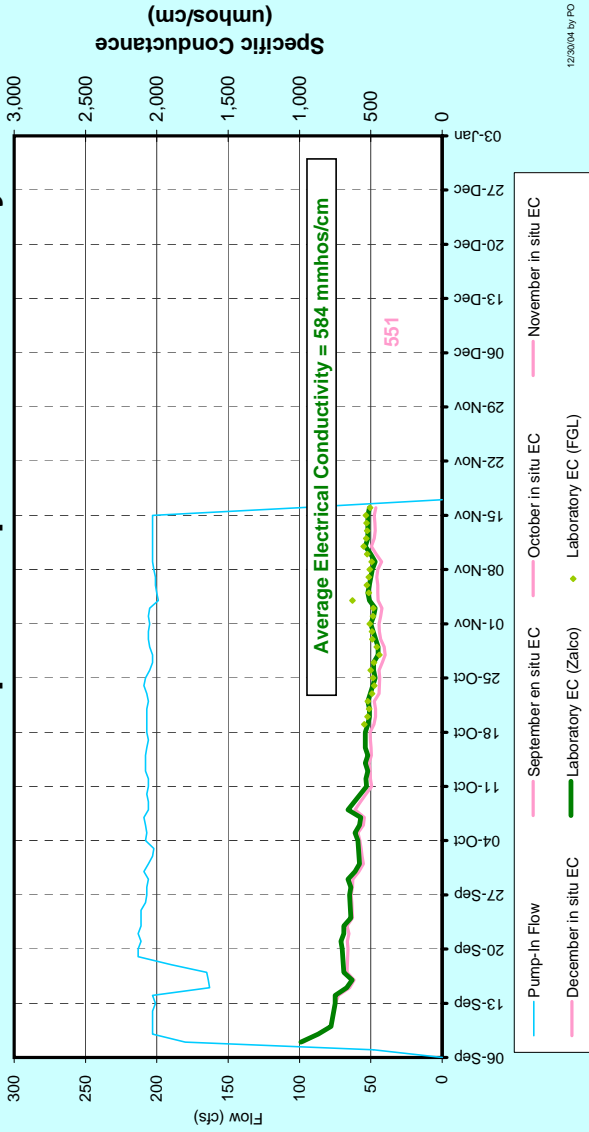
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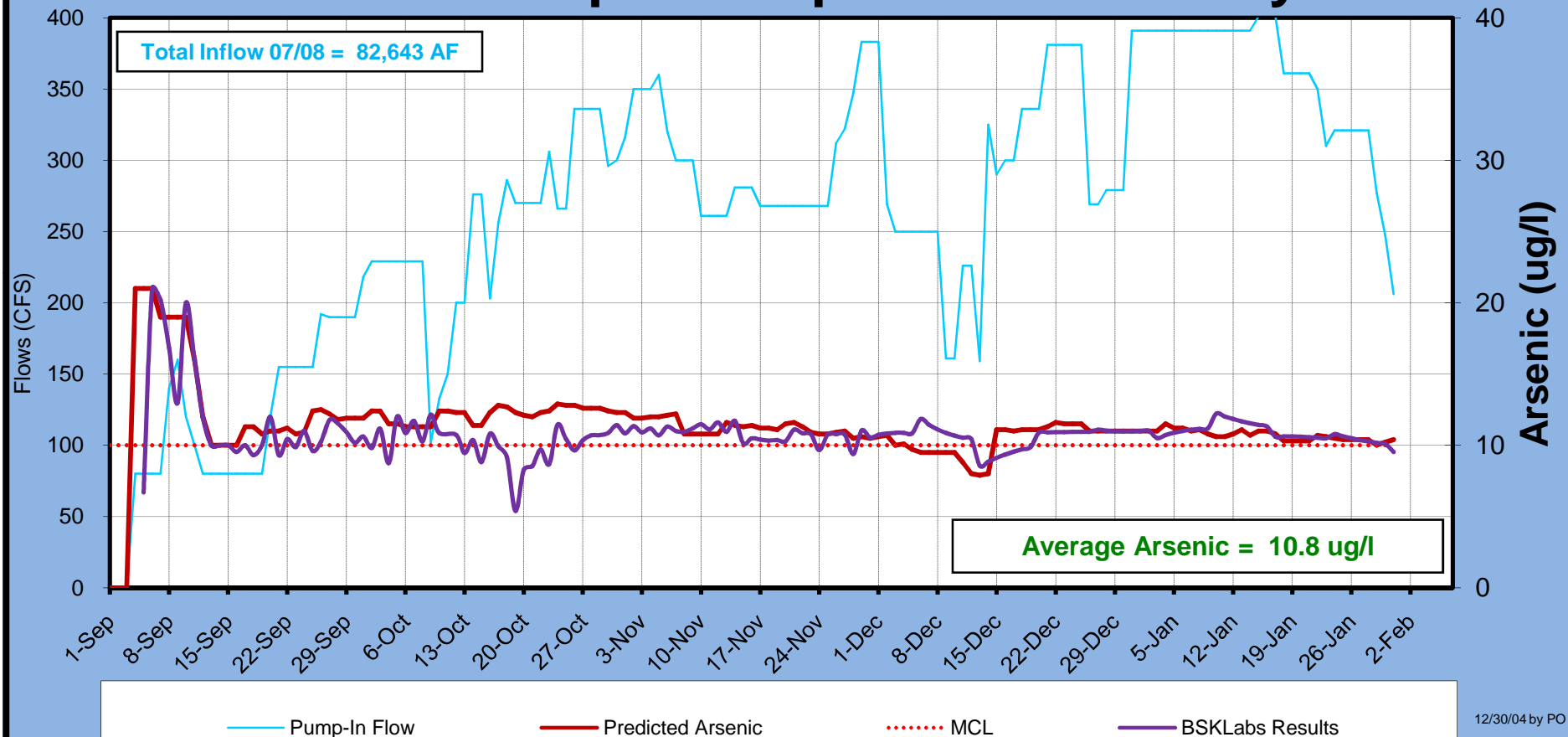
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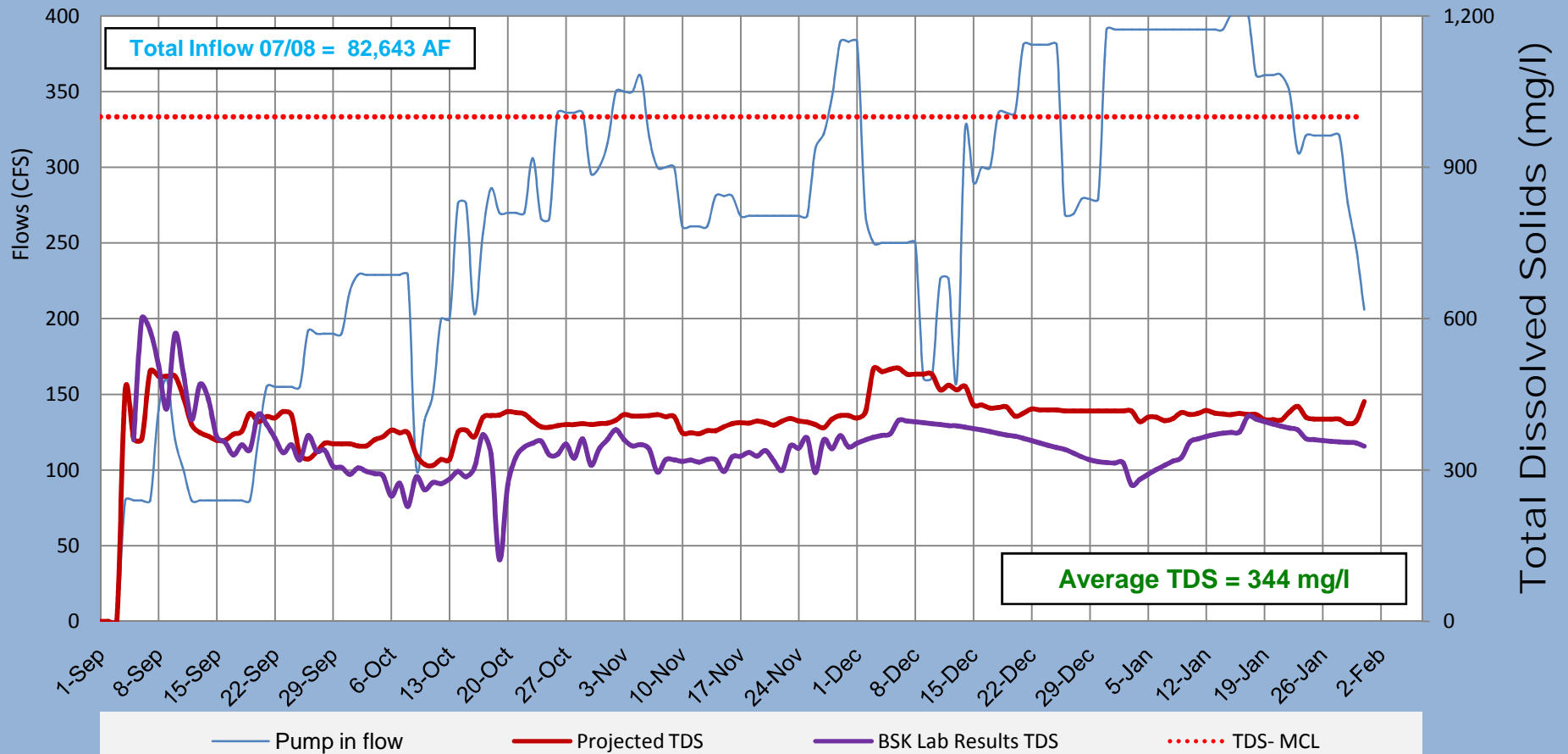
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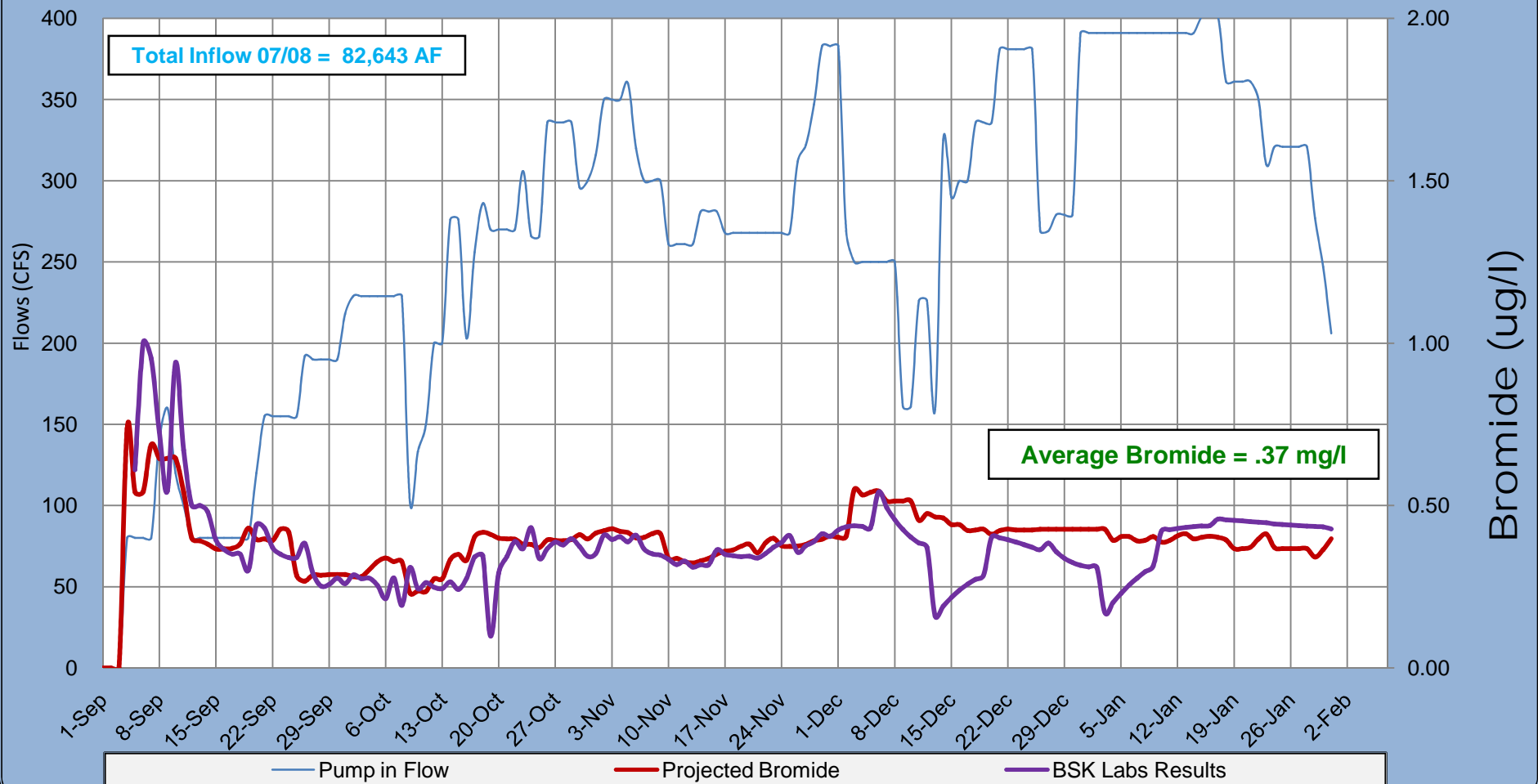
# 2007 Semitropic Pump-In Water Quality



## 2007 Semitropic Pump-In Water Quality

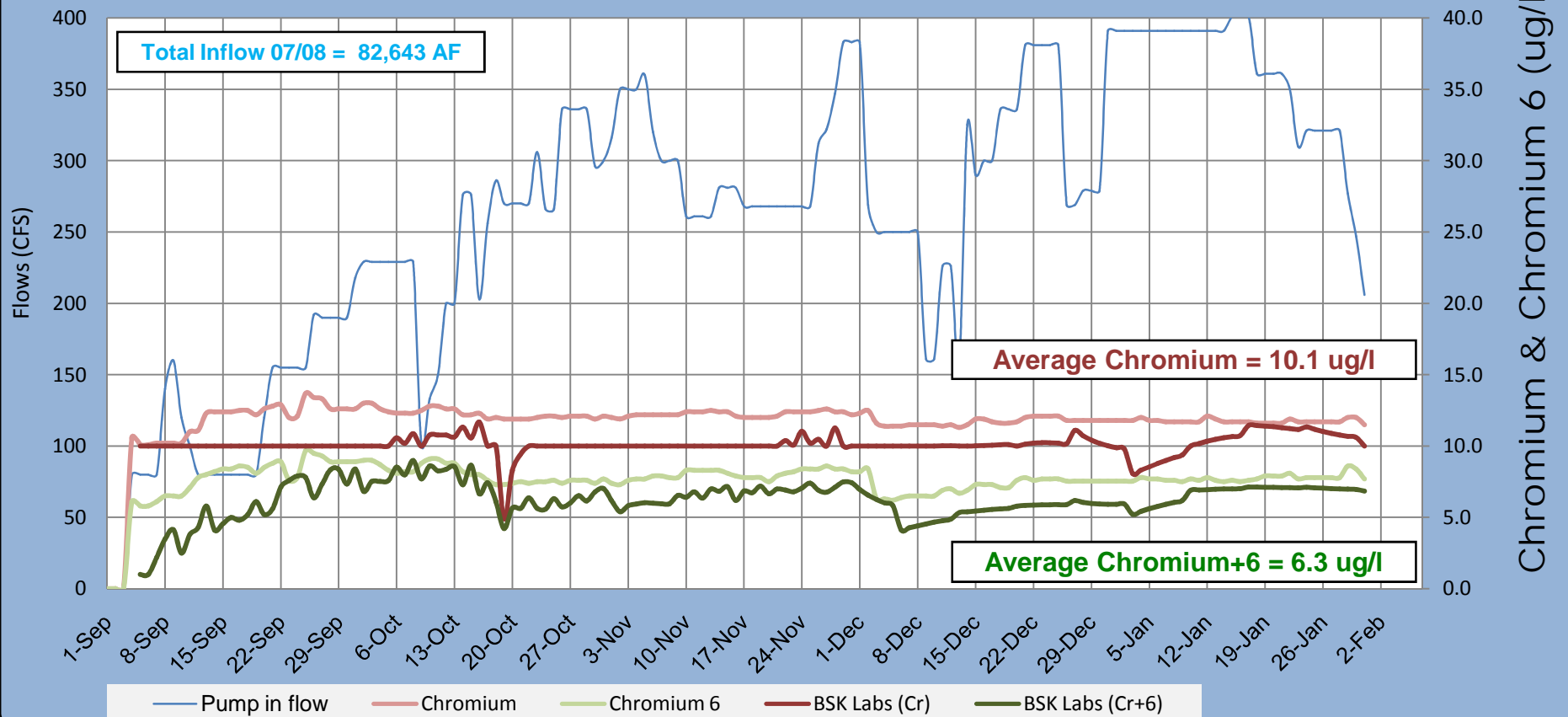


## 2007 Semitropic Pump-In Water Quality

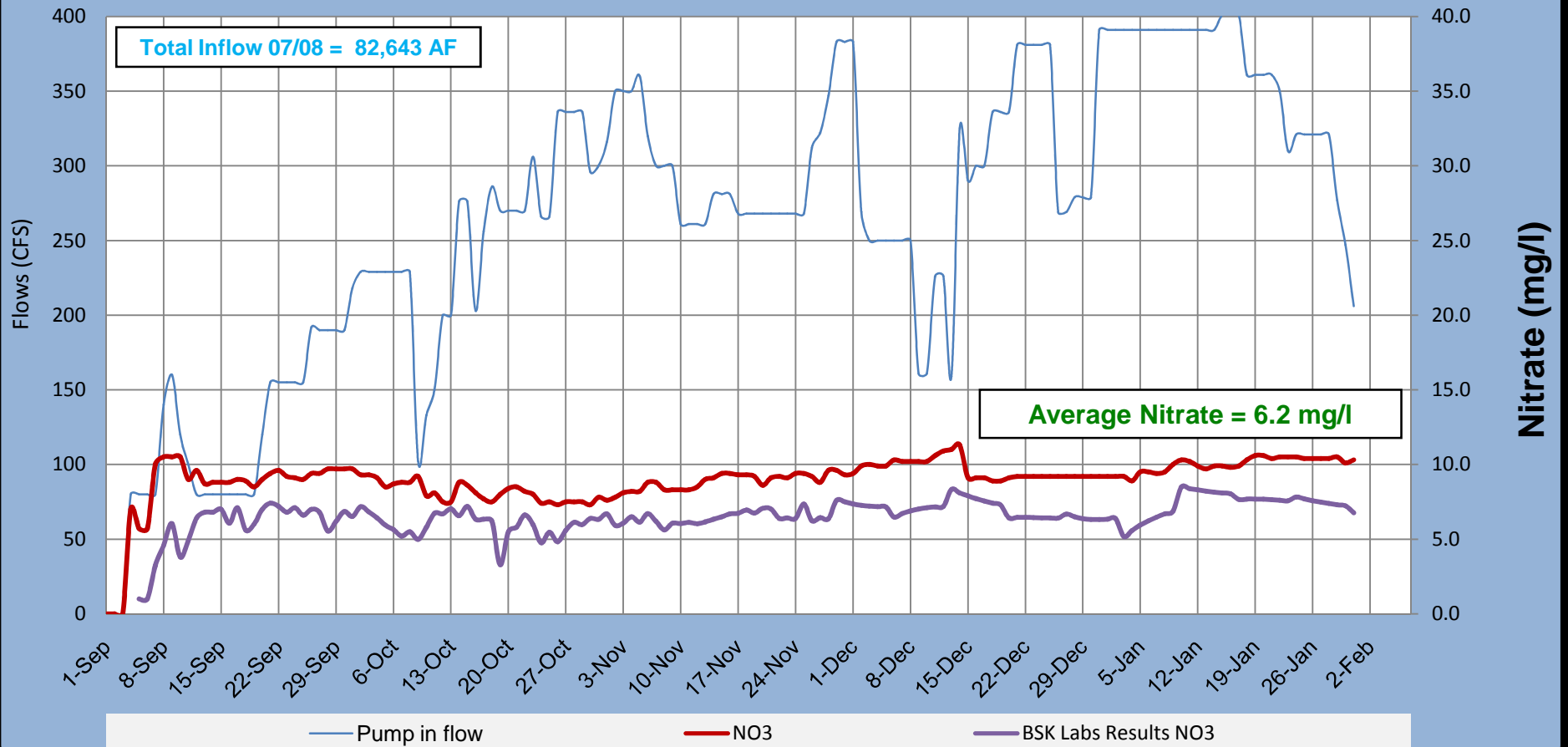




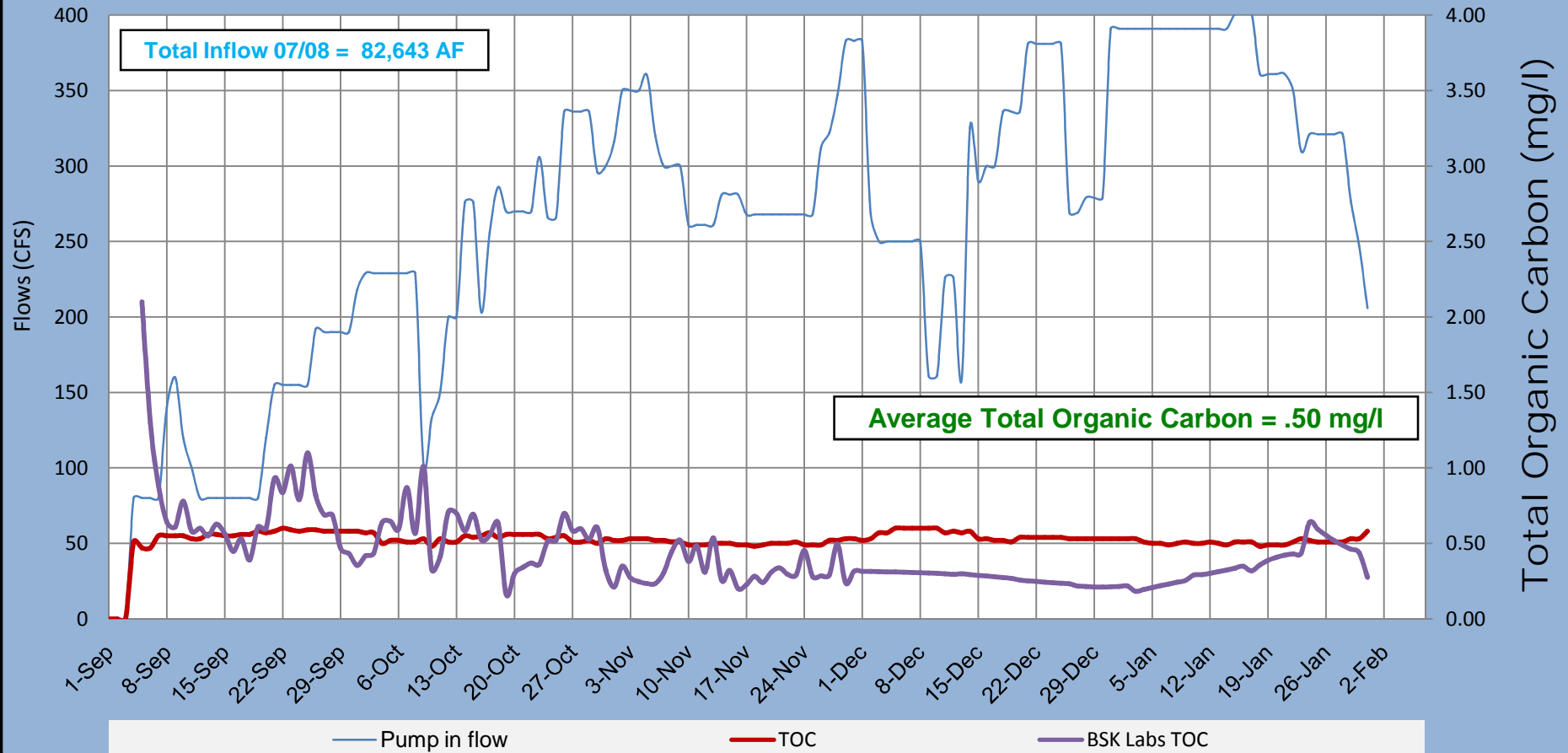
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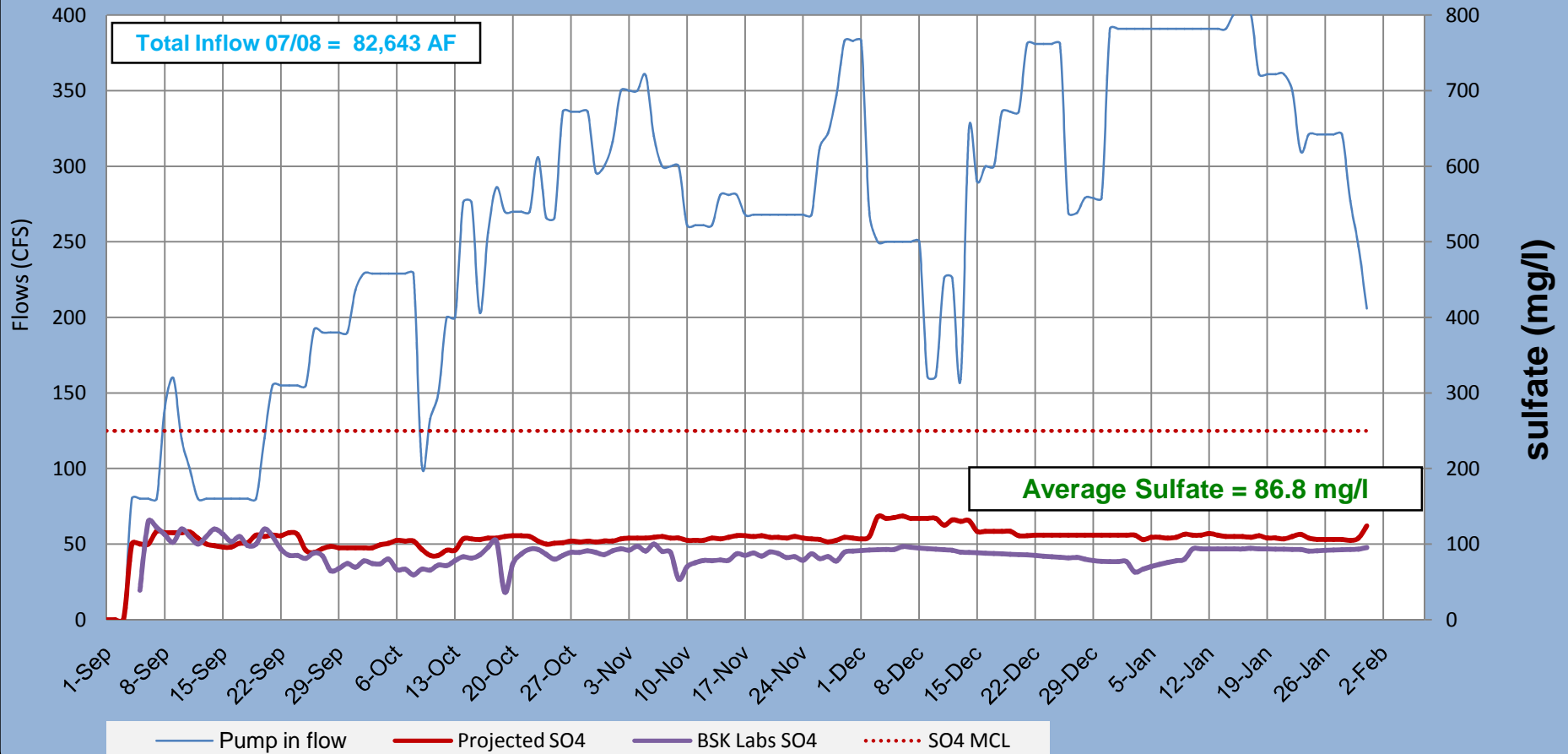
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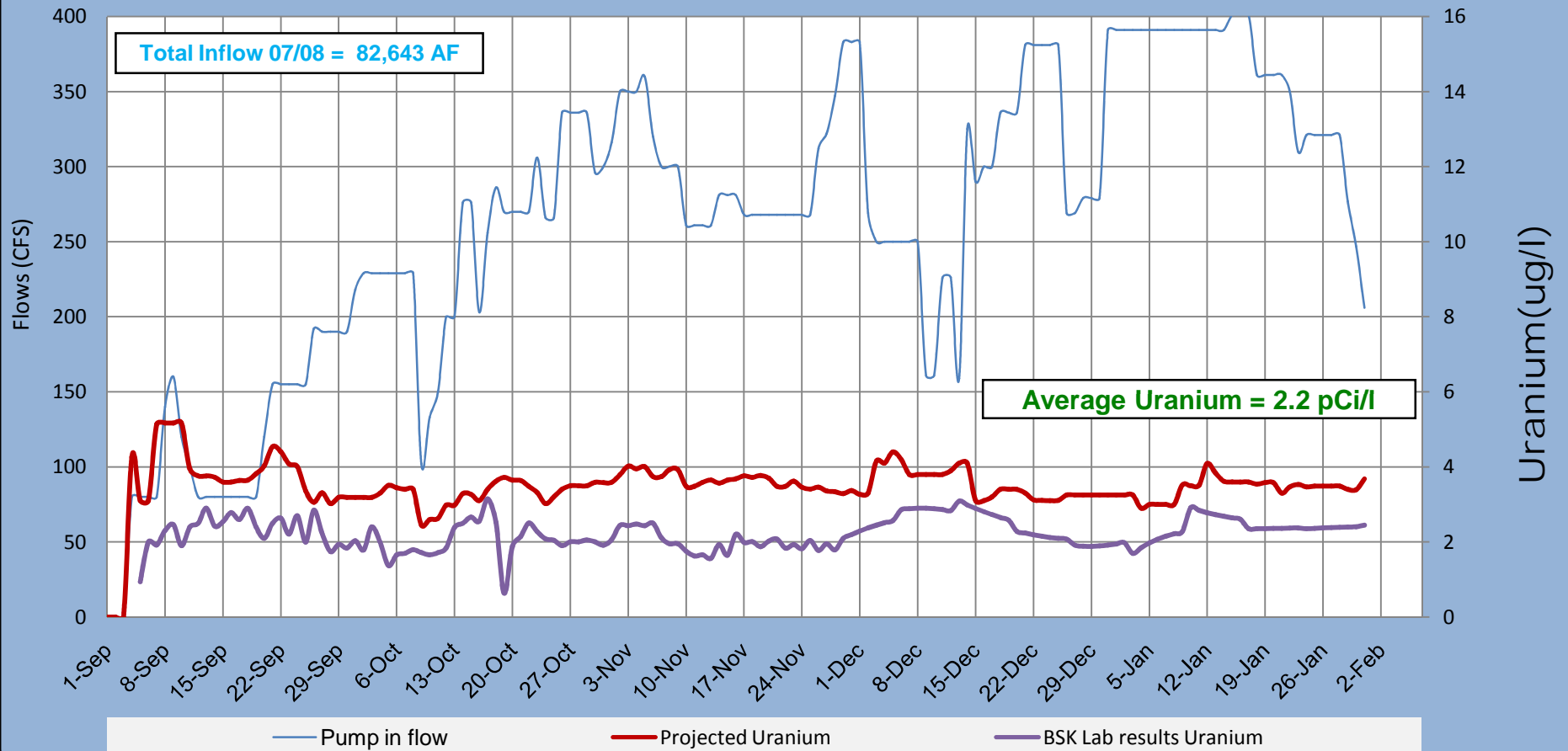
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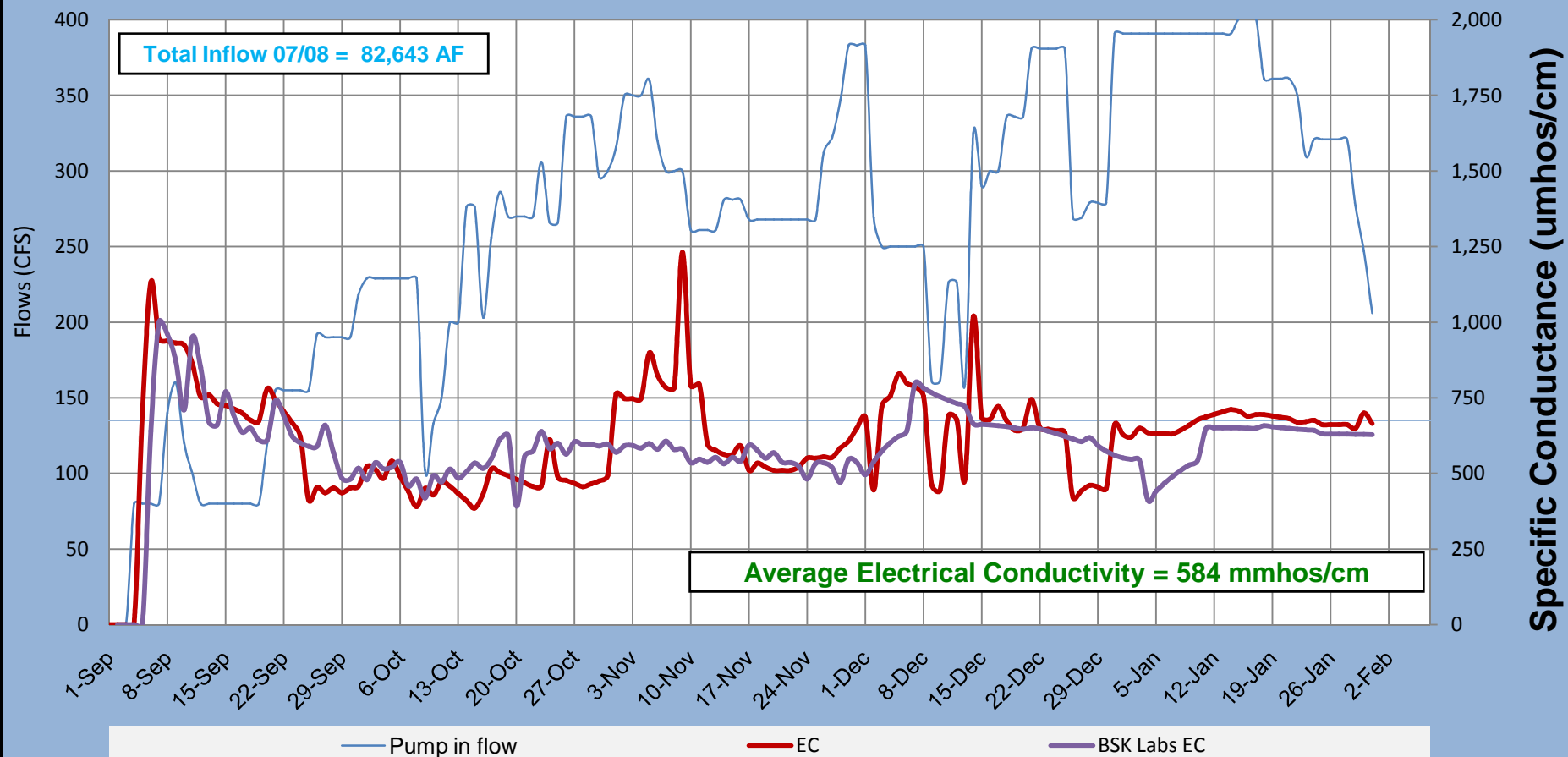
## 2007 Semitropic Pump-In Water Quality



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**FINAL ENVIRONMENTAL ASSESSMENT**

*CITY OF TRACY LONG-TERM GROUNDWATER BANKING PROGRAM WITH  
SEMITROPIC WATER STORAGE DISTRICT*

**Appendix C**  
**Environmental Determinations (Cultural Resources, ITA, ESA)**

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May 2011

## Healer, Rain L

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**From:** Bruce, Brandee E  
**Sent:** Wednesday, September 15, 2010 10:32 AM  
**To:** Healer, Rain L  
**Cc:** Perry, Laureen (Laurie) M; Nickels, Adam M; Overly, Stephen A; Barnes, Amy J; Goodsell, Joanne E; Ramsey, Dawn; Leigh, Anastasia T  
**Subject:** RE: EA-09-164 City of Tracy banking in Semitropic  
**Attachments:** EA\_CR-edits.doc

Project No: 10-SCAO-313

I have reviewed EA-09-164 for the City of Tracy Long-term Central Valley Project Water Groundwater Banking with Semitropic Water Storage District project. Please find the cultural resources sections of the EA attached for inclusion in the final EA.

The proposed action involves the transfer and storage of water through existing facilities. The action will not involve modification of facilities, construction of new facilities, and there will be no ground disturbance. This action has no potential to cause effects to historic properties pursuant to the regulations outlined at 36 CFR Part 800.3(a)(1). As a result, the proposed action has no impacts to cultural resources.

This concludes the Section 106 process for this undertaking. Please include a copy of this memo with the EA file. Thank you for the opportunity to comment.

BranDee

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**From:** Healer, Rain L  
**Sent:** Wednesday, September 15, 2010 8:33 AM  
**To:** Barnes, Amy J; Bruce, Brandee E; Goodsell, Joanne E; Leigh, Anastasia T; Nickels, Adam M; Overly, Stephen A; Perry, Laureen (Laurie) M; Ramsey, Dawn  
**Subject:** FW: EA-09-164 City of Tracy banking in Semitropic

I was wondering if this project has been assigned? I have not received a response as yet. Thanks everyone for your hard work!

---

**From:** Healer, Rain L  
**Sent:** Monday, August 30, 2010 10:26 AM  
**To:** McDonald, Shauna A; Barnes, Amy J; Bruce, Brandee E; Goodsell, Joanne E; Leigh, Anastasia T; Nickels, Adam M; Overly, Stephen A; Perry, Laureen (Laurie) M; Ramsey, Dawn  
**Subject:** EA-09-164 City of Tracy banking in Semitropic

I have attached the project description for EA-09-164 City of Tracy Long-term CVP Water Groundwater Banking Program with Semitropic Water Storage District.

Cost authority: A1R-1752-9652-220-02-5-0

Rain L. Healer  
Natural Resource Specialist  
Bureau of Reclamation  
1243 N Street, SCC 413  
Fresno, CA 93721  
(559) 487-5196  
[rhealer@usbr.gov](mailto:rhealer@usbr.gov)





## Healer, Rain L

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**From:** Rivera, Patricia L  
**Sent:** Monday, August 30, 2010 1:53 PM  
**To:** Healer, Rain L  
**Subject:** RE: EA-09-164 City of Tracy banking in Semitropic

Rain,

I reviewed the proposed action to approve the City of Tracy's long-term (through contract year 2035) groundwater banking of up to 10,500 AF per year (AFY) of their available Central Valley Project (CVP) surface water supplies with Semitropic. As part of this banking program, Reclamation proposes to approve the iterative transfers, exchanges and related actions for delivery of water to Semitropic for banking and return of the banked water to Tracy. These actions would be undertaken with the cooperation of the California Department of Water Resources (DWR).

The Proposed Action would be subject to the following conditions:

- The banking and exchange of Tracy's CVP water would be used as allowed in Tracy's long-term contract with Reclamation for CVP water (Contract number 14-06-200-7858A);
- Banked water would not use the In-Lieu Recharge and Recovery Area of the Store Water Recovery Unit within Semitropic;
- The water would only be used for beneficial purposes;
- The water would not be used to place untilled or new lands into production or convert undeveloped land to other uses;
- The proposed return of banked water would not adversely affect DWR, Reclamation, Semitropic, or Tracy's operations;
- The movement of water would not require the construction of any new water diversion or conveyance facilities;
- Returned water would be subject to Reclamation's water quality policy for non-CVP water introduced into federal facilities.

Tracy's banking supplies include their long term contract allocation (Contract No. 14-06-200-7858A), a contract assignment from West Side Irrigation District (Contract No. 7-07-20-W0045-IR12-B), and a contract assignment from Banta Carbon Irrigation District (Contract No. 14-06-200-4305A-IR12-B). Ten percent of water banked with Semitropic would be left in place to recharge the aquifer.

Tracy is a CVP contractor that receives its CVP supplies from milepost 15.95 on the Delta-Mendota Canal (DMC). Semitropic contracts with DWR for State Water Project (SWP) water through the Kern County Water Agency (KCWA). Physical Delivery of Semitropic's SWP water occurs through Reaches 10A, 12E, and 13B of the California Aqueduct (Aqueduct). While Tracy and Semitropic receive water from separate water projects, these two projects intersect and commingle water at the O'Neill Forebay of the San Luis Reservoir, located near Santa Nella, California. The exchange of water between the CVP and SWP systems would occur primarily at O'Neill.

Conveyance of water to Semitropic from Tracy would most likely occur as an operational exchange at O'Neill and then direct delivery to Semitropic's turnouts in KCWA. Tracy's CVP water would be released from the federal share of San Luis Reservoir by Reclamation and made available to DWR's SWP at O'Neill

via operational exchange. DWR would then deliver Tracy's CVP water from O'Neill to KCWA for banking within Semitropic or within Semitropic's share of the Kern Water Bank facilities.

Up to 3,500 AFY of banked water would be returned to Tracy on request. Methods for return could occur in the following ways:

1. The extracted Semitropic banked water would be delivered into the Aqueduct to meet downstream SWP demands. In exchange, a like amount of KCWA SWP water would be exchanged back to O'Neill for delivery, via the state share of the joint use San Luis Canal, to Westlands Water District (WWD) turnouts within Reach 7 of the Aqueduct servicing lands within Kings County which fall within the SWP Place of Use. In exchange, a like amount of WWD CVP water would be delivered to Tracy via Tracy's turnout along the DMC.
2. The extracted Semitropic banked water would be delivered into the Aqueduct to meet downstream SWP demands. In exchange, a like amount of KCWA SWP water would be exchanged back to O'Neill for delivery, via the state share of the joint use San Luis Canal, to WWD turnouts within Reach 7 of the Aqueduct servicing lands within Merced and Fresno Counties which fall outside the SWP Place of Use. A State Water Resources Control Board (SWRCB) approved Petition for Temporary Change in Place of Use would be obtained to authorize the delivery of the SWP water outside of the SWP place of use. This water would then be exchanged for a like amount of CVP water made available for delivery to Tracy via Tracy's turnout along the DMC.
3. The extracted Semitropic banked water would be delivered into the Aqueduct to meet downstream SWP demands. In exchange, a like amount of KCWA SWP water would be delivered to Tracy's turnout along the DMC via CVP's Jones Pumping Plant, as authorized under the SWRCB's Joint Point of Diversion (D-1641). While the delivery of the SWP water would not require a Change in Place of Use order, as the City of Tracy lies within the SWP place of use, it would require a Warren Act Contract to authorize the conveyance of the non-CVP water through federal facilities (the DMC).
4. In anticipation of the proposed San Luis Canal-DMC Intertie (Intertie), a fourth return mechanism is being contemplated. The extracted Semitropic banked water would be delivered into the Aqueduct to meet downstream SWP demands. In exchange, a like amount of KCWA SWP water would be delivered via SWP's Banks Pumping Plant, and diverted through the Intertie to Tracy's turnout along the DMC. While the delivery of the SWP water would not require a Change in Place of Use order, as the City of Tracy lies within the SWP place of use, it would require a Warren Act Contract to authorize the conveyance of the non-CVP water through federal facilities (the DMC).

The proposed action does not have a potential to affect Indian Trust Assets. The nearest ITA is Santa Rosa Rancheria, which is approximately 32 miles North of the project location.

Patricia

## Healer, Rain L

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**From:** McDonald, Shauna A  
**Sent:** Tuesday, March 22, 2011 4:51 PM  
**To:** Healer, Rain L  
**Cc:** Steve Bayley; James, Mary C. (Cathy)  
**Subject:** RE: City of Tracy  
**Attachments:** EA-09-164 Tracy banking 10-6-10 (2).docx; Regarding HCP coverage of ESA on the City of Tracy LT CVP water groundwater banking Semitropic...; RE: FW: HCP confirmation for City of Tracy (long-term CVP water groundwater banking with Semitropic WSD) Project

Hi Rain. Okay, here is the revised EA. Per the attached email messages, Steve Mayo (San Joaquin Council of Governments) confirmed that the projects under the City's General Plan would be covered by the county-wide HCP. We have confirmed with the City of Tracy that no aquatic habitat would be impacted, only terrestrial species and amphibians are at issue. The HCP covers these species. The City would ensure that at-issue projects would comply with the ESA; these are projects that might benefit from increased water supply reliability as a result of this proposed action. This may include either City projects or projects proposed by some other entity (e.g. a private company). Participation in the HCP is voluntary, but evidence of ESA compliance is required. As for Semitropic, to the very best of my knowledge, being the longest running person here to work with them, they have finally as of 2010 cleared up any and all prior environmental violations, and they have received coverage for the In Lieu Storage Area via the Kern Water Bank HCP. So as long as only existing facilities or the ILSA facilities are used (which does not include the well field by the Kern NWR), there would be no effects in Semitropic. They do not plan to build anymore facilities to support this action. Per Dave's attached message, Russ Grimes at Region determined we actually do not have to get a response from the Service. I had been having difficulties in communicating with them on this action because they seemed to believe that the projects could be permitted at this time. That is not possible, the projects are too far off and not ready for that step yet. All effects on federally listed species would be addressed through section 10 of the ESA and no further action pursuant to section 7 of the ESA is required.

Thanks,  
Shauna

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**From:** Healer, Rain L  
**Sent:** Tuesday, March 22, 2011 3:04 PM  
**To:** McDonald, Shauna A  
**Subject:** City of Tracy

Here is the Final EA. Please update language in the Biology section and in the consultation/coordination section. Could you also provide an email with your determination that I can include in the appendices of the EA. Thank you!

Rain L. Healer  
Natural Resources Specialist  
United States Department of the Interior  
Bureau of Reclamation  
1243 N Street, SCC 413  
Fresno, CA 93721  
(559) 487-5196  
[rhealer@usbr.gov](mailto:rhealer@usbr.gov)

## Healer, Rain L

---

**From:** Hyatt, David E  
**Sent:** Tuesday, March 22, 2011 1:02 PM  
**To:** McDonald, Shauna A  
**Subject:** Regarding HCP coverage of ESA on the City of Tracy LT CVP water groundwater banking Semitropic...

Hello Shauna

After further analysis and discussion with Russel Grimes we have determined ESA affects are covered by the HCP therefore we have no Section 7 coverage needed. Our requested confirmation with FWS is no longer required.

I called and left message with Mark Littlefield on the subject (just now).

Dave

David E. Hyatt  
Supervisory Biologist  
South-Central California Area Office  
Bureau of Reclamation  
Desk 559.487.5139  
Fax 559.487.5397

## Healer, Rain L

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**From:** Steve Bayley [steve.bayley@ci.tracy.ca.us]  
**Sent:** Thursday, January 20, 2011 4:14 PM  
**To:** McDonald, Shauna A  
**Subject:** RE: FW: HCP confirmation for City of Tracy (long-term CVP water groundwater banking with Semitropic WSD) Project

Shauna – Great! It may help to try to explain that the Tracy/Semitropic agreement FONSI is for water conveyance and storage through facilities that have already completed environmental documents. No new facilities will be constructed as part of the agreement. Growth in Tracy will occur with or without this project. All growth in Tracy must comply with environmental regulations like the HCP for ESA. And while participation in the HCP is voluntary, the HCP or some other compliance process is required for all development projects in Tracy. If I can be of assistance in reviewing, or any other way, let me know as I very much appreciate your work on this project. Steve

---

**From:** McDonald, Shauna A [mailto:SMcDonald@usbr.gov]  
**Sent:** Thursday, January 20, 2011 3:36 PM  
**To:** Steve Bayley  
**Subject:** RE: FW: HCP confirmation for City of Tracy (long-term CVP water groundwater banking with Semitropic WSD) Project

Here's what I'm going to do. I'm going to send the EA/FONSI with a cover memo and a copy of Steve Mayo's email to the Service (not to Ellen but I will copy her). I will explain why it's not possible to apply for coverage at this time. Then we will ask the Service to respond with regard to whether or not this addresses any ESA impacts. I will copy you on the memo.

---

**From:** Steve Bayley [mailto:steve.bayley@ci.tracy.ca.us]  
**Sent:** Thursday, January 13, 2011 8:27 AM  
**To:** McDonald, Shauna A  
**Subject:** FW: FW: HCP confirmation for City of Tracy (long-term CVP water groundwater banking with Semitropic WSD) Project

Shauna – I also received this email. Steve

---

**From:** William Dean  
**Sent:** Wednesday, January 12, 2011 3:07 PM  
**To:** dhyatt@usbr.gov  
**Cc:** Steve Bayley  
**Subject:** FW: FW: HCP confirmation for City of Tracy (long-term CVP water groundwater banking with Semitropic WSD) Project

Dave, please see the email below from Steve Mayo at SJCOG to me. It was developed by Steve Mayo in consultation with the USFWS and State Fish and Game this morning. This should address the concern that you raised. Please let me know ASAP if you need additional assistance.  
Thanks, Bill

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**From:** Steve Mayo [mailto:Mayo@sjcog.org]  
**Sent:** Wednesday, January 12, 2011 2:58 PM  
**To:** William Dean  
**Cc:** Victoria Lombardo  
**Subject:** Re: FW: HCP confirmation for City of Tracy (long-term CVP water groundwater banking with Semitropic WSD) Project

Bill,

The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) covers projects in San Joaquin County for endangered species under a federal Section 10 permit and a state Section 2081 permit valid through 2051. The City of Tracy is a signatory to the SJMSCP and processes development (residential, commercial, municipal, etc.) projects through the plan as covered activities. Any City of Tracy led project which converts habitat to non-habitat use is eligible for coverage by the SJMSCP under the existing and future General Plan.

I hope this will clarify the matter for the Bureau of Reclamation.

Sincerely,

Steve Mayo  
SJCOG  
209-235-0600

>>> "William Dean" <William.Dean@ci.tracy.ca.us> 01/10/2011 12:00 PM >>>

Steve, per our brief convo, can you please confirm for the Bureau of Rec that all projects under our GP are eligible for coverage in the HCP.

Thanks, Bill

---

**From:** Hyatt, David E [mailto:dhyatt@usbr.gov]

**Sent:** Monday, January 10, 2011 10:24 AM

**To:** William Dean; McBride, Ellen

**Cc:** Healer, Rain L; McDonald, Shauna A; Welsh, Richard A.; McBride, Ellen

**Subject:** HCP confirmation for City of Tracy (long-term CVP water groundwater banking with Semitropic WSD) Project

William -- Thank You for helping us move this project forward (a summary project description is below). Please confirm the project affects in this area are covered under your HCP.

Ellen -- If you need a "formal" letter from Reclamation rather than William's email please let us know.

Summary of the project description:

Reclamation proposes to approve Tracy's long-term (through contract year 2035) groundwater banking of up to 10,500 AF per year (AFY) of their available CVP surface water supplies with Semitropic. As part of this banking program, Reclamation proposes to approve the iterative transfers, exchanges and related actions for delivery of water to Semitropic for banking and return of up to 3,500 AFY of the banked water to Tracy. These actions would be undertaken with the cooperation of the California Department of Water Resources (DWR).

The Proposed Action would be subject to the following conditions:

- The banking and exchange of Tracy's CVP water would be used as allowed in Tracy's long-term contract with Reclamation for CVP water (Contract number 14-06-200-7858A);
- Banked water would not use the In-Lieu Recharge and Recovery Area of the SWRU. Rather, the East-West Pipeline (120-inch pipeline) would be used to deliver and return water from Semitropic's Direct Recharge Area;
- The water would only be used for beneficial purposes;
- The proposed return of banked water would not adversely affect DWR, Reclamation, Semitropic, or Tracy's operations;
- The movement of water would not require the construction of any new water diversion or conveyance facilities;

- Returned water would be subject to Reclamation's water quality policy for non-CVP water introduced into federal facilities.

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If you have any questions or comments please feel free to contact Shauna or me.

Thanks Again,

Dave

David E. Hyatt  
Supervisory Biologist  
South-Central California Area Office  
Bureau of Reclamation  
Desk 559.487.5139  
Fax 559.487.5397